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ABSTRACTS

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DRUG HYPERSENSITIVITY

LBTP1804 | Allergy to low molecular weight heparins

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Background: Considering the widespread use of heparins in daily clinical practice, the incidence of hypersensitivity reactions to heparins may be higher than previously thought. They are known to provoke all types of hypersensitivity reactions, especially delayed-type hypersensitivity (DTH), like so heparin-induced immune thrombocytopenia (HIT), allergic vasculitis, hypereosinophilia or urticarial/angioedema. Our aim was to characterize the patients of hypersensitivity to Heparins in our clinical practice.

Method: A retrospective study was performed in our Allergy Unit; (January-2013 to December-2018) Clinical records were registered from all patients who performed heparins hypersensitivity. Each patient, including skin testing and challenge test with heparin involved and others heparins.

Results: The study included 32 patients for drug allergy workout. (87 5% female, 12.5% males) mean ages: 61.23 years. In 23 (71.87%) of 32 patients had finally diagnosis of allergy to at least one heparin. The heparins most used were the LMWH, being enoxaparin followed by bemiparin, dalteparin and fondaparinux.

78.2% had DHT; 13% patients: urticarial/rash, 4.4%: anaphylaxis 4.4%: leukocytoclastic vasculitis. Patch test was performed with different heparins in 10 of 23 patients. Skin testing was performed in all patients. It was positive three cases with the culprit drug; one of these cases was positive intradermal test with two alternatives drugs. Subcutaneous challenge test was performed with the culprit drug and alternatives heparins. Results were Positive sc challenges with Enoxaparin: 65.2%, Bemiparin: 34.7%, nadroparin: 21.7%, tinzaparin: 17.3% and heparin in 4.3%. Fondaparinux sodium was given subcutaneously in seven of 23 patients and was well tolerated. Intravenous provocation with heparin was not performed because the anaphylaxis episodes (3) in the same patient. In 9 patients in whom there was only one involved (heparin), after the allergological study, other low molecular weight heparins were also positive (bemiparin, tinzaparin, nadroparin).

Conclusion: In this study, the incidence of hypersensitivity reactions to heparins is low but increasing. In our experience most common clinical entity was delayed-type hypersensitivity (DTH), followed by urticaria, anaphylaxis and vasculitis. We observed a high cross-reactivity among LMWHs and Heparin. Challenge is considered the gold standard for the diagnoses, being the clinical findings similar to previous reported.

LBTP1805 | Safety and effectiveness of rapid desensitization in the management of hypersensitivity reactions to chemotherapeutic agents

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Background: Hypersensitivity reactions (HSRs) to chemotherapy have increased in the last 20 years, preventing the use of first-line therapies, with a negative impact in patient's survival and quality of life. Rapid drug desensitization (RDD) is a procedure that allows safe re-administration of a drug to which a patient has become allergic.

Method: Between 2010 and 2018, we have performed 372 RDD (Brigham and Women's Hospital Program with a standardized 12-16 step protocol) in 82 oncologic patients. Seventy seven (93.9%) patients were women, most of them (87.8%) with a gynecological cancer. Two patients had HSRs to 2 drugs and one patient to 3 drugs, bringing the total number of HSRs to 91. Patients reacted to carboplatin (n = 59), paclitaxel (n = 14), liposomal doxorubicin (n = 7), cisplatin (n = 4), oxaliplatin (n = 4), docetaxel (n = 2) and etoposide (n = 1). All RDD were performed in the hospital setting under the close observation of an allergist. Acetyl Salicylic Acid (300 mg) and montelukast (10 mg) were administered orally 48 hours, 24 hours and 30 minutes before the initiation the protocol and specific premedication dictated by oncology department.

Results: A total of 331 (8.9%) RDD were performed in 64 patients (78%) without reactions; 41 (11%) of RDD in 18 patients (22%) elicited a reaction. 11 (13.4%) patients presented a mild or moderate reaction, and 7 (8.5%), a severe reaction. In 5 of the subjects with

severe anaphylactic reactions, the treatment was discontinued and was switched to a second-line treatment, whereas 2 patients continued the RDD with omalizumab premedication. As a result RDD were performed in 77/82 patients accounting for an effectiveness of 93.9%. The majority of reactions (38/41 = (92.7%) appeared during the infusion of pure drug solution and only 3 of 41 (7.3%) during the infusion of a 1/10 dilution, being the latter all mild. 72.2% of reactions developed at steps 11-14.

Conclusion: In our experience RDD can elicit allergic reactions, but when performed by expert allergists in a hospital setting it is a safe and effective procedure that allows 94% of patients to receive the first line treatment. In patients experiencing severe anaphylaxis omalizumab may be added to the standard premedication to enhance safety.

LBTP1806 | Investigation of piperacillin/tazobactam allergy in 48 patients

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Background: Piperacillin is a widely used and important ureidopenicillin antibiotic used in combination with tazobactam, a beta-lactamase inhibitor. Various adverse drug reactions to piperacillin/tazobactam have been described. We report the results of a cohort of patients seen for suspected hypersensitivity reactions to piperacillin/tazobactam in allergy clinic over 6 years (2012-2018).

Method: 48 patients (aged 6-81, med = 39). 30 female:18 male. The patient group had high levels of comorbidity; 14 participants including 9/18 males had cystic fibrosis. We performed skin prick tests (SPT) and intradermal tests (IDT) to piperacillin/tazobactam, penicillin PPL (major determinant) and MD (minor determinant), benzylpenicillin, amoxicillin, co-amoxiclav and flucloxacillin.

Results: Allergy was confirmed in 22/48 participants. 15/22 had a delayed positive IDT (9 female:6 male). 5/15 showed cross-reactivity to other penicillins. Of 10 patients who showed no cross-reactivity, 7 subsequently tolerated other penicillins [co-amoxiclav (4) flucloxacillin (1) meropenem (1)] and ceftazidime (1). 4 patients that tested negative in all SPT and IDT nevertheless had a clinical presentation which strongly indicated a delayed piperacillin/tazobactam hypersensitivity. 7/22 had immediate positive skin tests (7/7 female). 2/7 had a positive SPT. 5/7 had a positive IDT. 2/7 had cross-reactivity to other penicillins on skin testing [Benzylpenicillin (2), amoxicillin (1)]. 1 patient was allergic to the beta-lactamase inhibitor, showing cross-reactivity in vivo to co-amoxiclav, positive skin tests to clavulanic acid and negative skin tests to other penicillins. 1 patient who showed no cross-reactivity subsequently tolerated amoxicillin.

Conclusion: Delayed type hypersensitivity to piperacillin/tazobactam is more common than immediate type hypersensitivity (73% : 27%). Piperacillin hypersensitive patients were likely tolerant to other penicillins if skin tests to these are negative; 7 piperacillin allergic patients in our cohort tolerated the aminopenicillin amoxicillin on subsequent challenge. This is especially important given comorbidities. Only 1 patient was allergic to the beta-lactamase inhibitor. SPT is less sensitive than IDT in diagnosing immediate-type piperacillin/tazobactam allergy: 2 patients presenting with anaphylactic reactions did not react to SPT testing, showing hypersensitivity only in IDT challenge. Although skin testing was generally safe, 1 patient with cross-reactivity suffered a systemic reaction after SPT.

LBTP1807 | The utility of drug provocation tests in iodinated contrast media hypersensitivity

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Background: Iodinated contrast media (ICM) are increasingly used worldwide. Therefore, although hypersensitivity reactions (HSR) to ICM are rare, they occur regularly and are often severe and even life-threatening. The diagnosis of HSR to ICM includes clinical history, skin tests and drug provocation test (DPT). The aim was to describe the experience of our Allergy Departments with the diagnosis of HSR to ICM.

Method: Retrospective review of all patients referred to our Departments in 2018 with history of HSR to ICM. The panel of ICM included: iomeprol (Iomeron 400 mg/mL), iopromide (Ultravist 370 mg/mL), iodixanol (Visipaque 270 mg/mL), ioxitalamate (Telebrix 300 mg/mL). Skin prick tests (SPT) with undiluted ICM and intradermic tests (IDTs) were performed. In case of positive skin test it was performed a DPT with an alternative ICM. In patients with an anaphylactic HSR and all the skin tests showed negative results, we performed a DPT with an alternative ICM. The DPT was performed with increasing doses according to protocol: 5, 15, 30 and 50 cc with 30-minute intervals.

Results: A total of 13 patients (mean age 49 years; range 23-76), 8 females and 5 males, were evaluated. All patients experienced an HSR within the first hour after ICM administration [immediate reaction (IR)]. The culprit ICM was known in 62% of all patients: iopromide (Ultravist) was involved in 7/8 patients and ioxitalamate (Telebrix) in 1/8 patients. Four patients had been exposed to ICM in the past. History of previous exposition to ICM was unknown in 9 patients. Anaphylaxis occurred in 8 patients, one with hypotension (anaphylactic shock). 7/13 patients had atopic history (n = 4 with history of HRS to other drugs). The results of SPT, IDT and DPT are shown in Table 1.

Conclusion: 62% of all HSR experienced anaphylactic reactions. The patient with DPT positive (iomeprol) had negative tests with iomeprol, which corresponds to 1 false-negative. It is noteworthy to observe the proportion of patients who tolerated in DPT the

TABLE 1. Results of SPT, IDT and DPT to ICM

SPT (n = 13)	IDT (n = 13)	DPT (n = 13)	ICM of the DPT
Negative (n = 12)	Negative (n = 5)	Negative (n = 5) (n = 5 with an alternative drug)	Iomeprol (n = 4) Iopromide (n = 1)
	Positive (n = 7) Iomeprol (n = 3) Iopromide (n = 3) Iopromide and iodixanol (n = 1)	Negative (n = 6) (n = 5 with an alternative drug) (n = 1 with the culprit drug) Positive (n = 1) (n = 1 with an alternative drug)	Iomeprol (n = 3) Iopromide (n = 3) Iomeprol (n = 1)
Positive (n = 1) Ioxitalamate (culprit drug)	Positive (n = 1) Iopromide (n = 1)	Negative (n = 1) (n = 1 with an alternative drug)	Iomeprol (n = 1)

alternative ICM (92%) which could be used in future radiologic interventions. Our workup allowed to identify a safe alternative drug.

LBTP1808 | Severe reaction after re-exposure to BLs support to re-evaluate allergic patients with clear histories but negative allergological studies

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Background: Up to 10% of patients with a clear long past history but negative allergological study of betalactams, develop a reaction after a subsequent administration. EAACI guidelines recommend a re-exposure to exclude re-sensitisation.

Method: We present three cases of subjects who after an initial negative evaluation developed a severe anaphylactic response in the re-exposure.

Results: Case 1: a 31 year old M who reported in childhood erythema after topical penicillin with no betalactams intake after. In August-2018 ceftriaxone was needed for treating an endocarditis. An allergological study with penicillin and ceftriaxone was negative tolerating a therapeutic course. Upon request, skin test and tolerance with penicillin was confirmed again. Three weeks after skin test with ceftriaxone and challenge was negative. After administering the last dose of 500 mg in a course of 7 days, the patient had dizziness, malaise and vomiting with facial and upper limbs erythema, sweating and mucocutaneous pallor. Blood pressure was 6/4 mmHg and gradually normalized after treatment.

Case 2: a 64 year old M reported immediate urticaria after AX 25 years ago. The allergological study with benzyl penicillin and AX was negative in the first evaluation with a positive skin test to PG followed by a severe systemic response in a second evaluation.

Case 3: A 39 year old F had two anaphylactic episodes with AX and AX-Clavulanic each. The first allergological study was negative but in the second evaluation an anaphylactic reaction appeared in spite of negative skin testing with PG.

Conclusion: We present three cases who experienced a severe reaction after a re-exposure to BLs and/or skin testing. We advise to consider repeating skin testing in subjects with consistent past histories in order to mislabel cases as no allergic.

LBTP1809 | Allergic reactions to topical lidocaine: Cases reports

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Background: Local anesthetics are very often used in minor surgical procedures and dentist treatments, however amide compounds are associated with an incidence lower than 1% of reported cases.

Method: We present two cases: A 55 year old male diagnosed with urinary infection showed local pruritus, erythema and angioedema after a few hours of applying lidocaine cream during bladder catheterization.

A 38 year old female showed pruritus, blush and facial macular rash after few minutes applying lidocaine cream in aesthetic treatment. Both reactions were controlled with a few days of oral corticosteroids and antihistamine. Patients signed informed consent and allergy study was performed with skin and epicutaneous tests (standard patch, lidocaine, mepivacaine, bupivacaine, articaine, 5-10% in pet.), subcutaneous controlled challenge test.

Results: CASE 1: Patch tests with lidocaine and mepivacaine (5-10% in pet.) were positive in lecture at 48 and 96 hours, negative to bupivacaine and articaine. Skin testing with articaine and bupivacaine were negative so we performed subcutaneous controlled tests with them confirming good tolerance.

CASE 2: Patch tests resulted negative in lecture at 48 and 96 hours. Intradermal testing with lidocaine and mepivacaine (1/100) were positive in immediate lecture, and negative with bupivacaine and articaine. We performed subcutaneous controlled tests with bupivacaine and articaine assuring tolerance to both of them.

Conclusion: A true immunologic reaction to amide anesthetics is very rare, however we presented two cases diagnosed with hypersensitivity to lidocaine, showing cross reactivity to mepivacaine.

Both patients were sensitized after applying topical anesthetic confirming an immediate and a delayed allergic reactions.

LBTP1810 | Evaluation of NSAIDs tolerance following Omalizumab treatment for chronic spontaneous urticaria

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Background: Multiple nonsteroidal anti-inflammatory drug (NSAID) cutaneous reactors may have underlying chronic spontaneous urticaria (CSU). The potentially beneficial effect of Omalizumab treatment on NSAID hypersensitivity associated to CSU has not been well evaluated so far.

Method: Clinical case description, based on medical file and oral drug provocation tests (DPT) in a Drug Allergy Unit of Brazil.

Results: MBS, a 53 year old female presenting CSU since 2002. She also reported mild intermittent asthma and allergic rhinitis since childhood. In 2009 she started to present urticaria and angioedema exacerbations 10 minutes after intake of several NSAIDs, without respiratory symptoms worsening. Patient underwent oral DPT with paracetamol in increasing doses every 20 minutes achieving a cumulative dose of 500 mg. After 100 mg of paracetamol she developed urticaria. In a different moment she was submitted to DPT with Etoricoxib 60 mg with tolerance, being released for use only selective COX2 inhibitors. With worsening of CSU, the therapy with Omalizumab was indicated. After 4 months of treatment with Omalizumab 300 mg/month, patient achieve urticaria control and was submitted to DPT with Paracetamol 500 mg once more, but now with tolerance.

Conclusion: Up to 30% of CSU are exacerbated by NSAIDs. The clinical case shows the importance of assessing the tolerance to NSAIDs after disease control, with the purpose of increase NSAIDs options and release the use of cheaper and safer drugs.

LBTP1811 | Prevalence of registered penicillin allergy in primary care in the Netherlands

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Background: A registered penicillin allergy often cannot be verified by allergy testing in approximately 90% of cases. Incorrect penicillin allergy labels may cause increased use of secondary choice antibiotics, increased bacterial resistance against antibiotics and increased costs. Only few studies have been performed in primary care on this topic. As the majority of penicillin is prescribed in primary care, it is important to determine the magnitude of penicillin allergy in primary care. The aim of this pilot study was to determine the prevalence of registered penicillin allergy in primary care.

Method: We performed a single-centre pilot study among 1014 patients at the Academic Primary Care Centre Groningen, the Netherlands. Patients with a penicillin allergy label were identified in the electronic health records of patients by International Classification for Primary Care codes: A12 (allergic reaction) including A12.01 (anaphylaxis), A12.02 (angioedema), A13 (worries about side effects drug), A85 (drug side effect) including A85.01 (drug allergy), S98 (urticaria) and S07 (general redness skin, erythema). The prevalence of reported penicillin allergy was measured by dividing the number of participants with a registered penicillin allergy by the total number of patients in the study population.

Results: Penicillin allergy was registered in 24 out of 1014 patients (2.36% of patients). Participants were mainly women (75%). Amoxicillin allergy was reported in 18 of 24 patients (75%) and allergy for other antibiotics (Flucloxacillin, Pheneticillin) was reported in 6 of 24 patients (25%). We found that only skin symptoms were reported in 9 patients (38%), anaphylaxis was reported in 1 patient (4%), other symptoms were reported in 4 patients (16%) and no information about symptoms was reported 10 patients (42%).

Conclusion: Penicillin allergy was registered in 2.36% of patients. In 42% of patients no additional information was registered in the health record about the symptoms on which the label penicillin allergy was assigned. In order to verify these penicillin allergy labels additional research is needed.

LBTP1812 | Audit of β-lactam drug challenges in a Tertiary Children's Allergy Service and the outcomes of subsequent courses of antibiotics

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Background: A retrospective study of b-lactam drug allergy (BLDA) challenges in children attending a tertiary allergy centre. Many children are labelled as having ab-lactam drug allergy when they do not have a true drug allergy. This leads to inappropriately prescribed, second-line, broad spectrum antibiotics which are more toxic, expensive and potentially exert a selection pressure for antimicrobial resistance. While the gold standard for diagnosing b-lactam allergy is a provocation challenge, initial skin prick testing to the major determinant benzylpenicilloyl (PPL) and the minor determinant mixture (MDM) is routine in our clinic followed by oral challenges with penicillin, amoxicillin or co-amoxiclav. The children were followed up to see if subsequent courses were tolerated.

Method: To assess whether children labelled with a BLDA have a true drug allergy. If deemed non allergic, to remove the label of being penicillin allergic from patient. A retrospective review of the case notes of BLDA was reviewed between the years 2014-2018. After a relevant history taken, the children were seen in the drug challenge service where one dose or graded doses of triggering antibiotic

given, followed by an observation period of an hour with an additional 5 day course of antibiotic on discharge to rule out a delayed reaction. The children's GP were contacted to see if subsequent courses were tolerated.

Results: 158 patients were challenged to penicillin. 45 (62%) male;27 (37%) female Age mean age 5 years 4 months. The presenting symptom (s) included a viral infection with fever 13 (35%), a viral rash25 (34%), Erythema Morbilliform rash 21 (29%),urticarial rash 18 (25%), chest infection 11 (15%),ear infection 9 (12%); angioedema 9 (12%), tonsillitis 7 (10%), Erythema Multiforme rash 4 (5%), and Macular papular rash 4 (5%). The challenge outcomes showed 153 (96%) passed with no signs of a systemic or delayed allergic reaction and 5 (4%) failed with 2 (1.2%) presenting in hospital and 3 (1.8%) post challenge with delayed symptoms. 72 (45%) patients had subsequent courses of antibiotics with no reaction.

Conclusion: Viral infections are the commonest cause of rashes in children under 5 years of age. Our study confirms that many children (96%) are falsely labelled as having a BLDA and can be challenged in the "one dose" clinic safely. Many children have gone on to have subsequent courses with no issue and this has a impact on cost benefit as well as improved patient outcomes.

LBTP1813 | Anaesthesia-associated hypersensitivity reactions

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Background: Hypersensitivity reactions (HSR) during anesthesia are an important cause of morbidity and mortality. These reactions are rare but often severe and difficult to manage due to the number of drugs involved.

Method: Retrospective analysis of patients referred to our department who experienced HSR during general or local anesthesia between 2009 and 2018, was performed. Allergy evaluation including demographics, co-morbidities, HSR description, results of in vitro and in vivo tests were reviewed.

Results: Eighty-five patients (77.6% female) were evaluated. Sixty-five patients (76.4%) experienced HSR with general anesthetics (GA) and 20 (23.6%) with local anesthetics (LA). In the GA group (76.9% female, mean age 47 ± 18 year) isolated skin reactions were the most frequent (43.1%). Sixty-one reactions (93.8%) were considered immediate. Tryptase levels in acute phase were obtained in 19 patients and just 1 had an elevated higher value. Hypnotic agents were the most common suspected drugs (n = 41 [48.8%]) and among them Propofol was the main one (n = 42 [72.9%]). Cefazolin was the most common culprit (n = 9). Mean age was significantly lower in patients with HSR when compared to patients without HSR ($P < 0.01$), and atopic patients had more HSR in comparison to non-atopic patients ($P < 0.001$). We found no association between HSR and asthma, cardiovascular disease, angiotensin converting enzyme inhibitors, angiotensin II antagonist or β-blockers, cancer, autoimmune or thyroid disease.

In LA group (n = 20 [80% female, mean age 46 ± 22 year]), isolated skin reactions were the most frequent (42%). Suspected LA agents were Articaine (n = 5), Lidocaine (n = 5) and unknown in 5 patients (26.3%). Only one patient showed positive ST results with Lidocaine.

Conclusion: Antibiotic agents, mainly cefazolin, were the most common culprit drug in our patients. Younger age and Atopy were associated with HSR development. LA allergy is very rare. Close attention should be paid even to mild HSR since this could be the first sign of a life-threatening reaction.

LBTP1814 | Progesterone hypersensitivity treated with a subcutaneous desensitization protocol

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Background: Allergic reactions induced by high-dose exogenous progesterone required for in vitro fertilization (IVF) can limit the patient's ability to achieve pregnancy. Patients with demonstrated progesterone hypersensitivity can be treated with desensitization protocols.

Method: A 40-year-old woman with personal history of allergy to hymenoptera venom (Apis mellifera) treated with immunotherapy and infertility was referred to our Allergy department for evaluation of local reactions after injection of exogenous progesterone and local pruritus and generalized urticaria after administration of intravaginal progesterone ovules. Her obstetrician advised us that high-dose of systemic progesterone (25 mg of Prolutex® twice a day) was needed to achieve significant rise of progesterone levels to successful IVF.

Results: Skin test (both prick and intradermorreaction) with exogenous progesterone (dilutions 1/1000, 1/100, 1/10) were performed, showing positive results in intradermorreaction to all of them.

For our patient, intravaginal progesterone preparations were not an option, as she had presented local reaction and generalized urticaria when this treatment was performed, and progesterone levels were not enough using this route. As an alternative, we adapted previously described intramuscular progesterone desensitization protocol, using a 2-day scheme and the subcutaneous route, without premedication, resulting in good tolerance (final dose tolerated: 50 mg) and correct progesterone levels to initiate IVF programme.

Dose no.	Time	Dose (mg)	Dilution	mL
1	0.00	0.002	1:1000	0.1
2	0.15	0.004	1:1000	0.2
3	0.30	0.020	1:100	0.1
4	0.45	0.040	1:100	0.2
5	1	0.200	1:10	0.1
6	1.15	0.400	1:10	0.2
7	1.30	1.100	1:10	0.5
8	1.45	2.200	1:10	1
9	2	4.500	1:1	0.2
10	2.15	7.800	1:1	0.35
11	2.30	10.130	1:1	0.45
12	2nd day	25	1:1	1.112

Conclusion: We present a case of progesterone hypersensitivity successfully treated with a modified desensitization protocol, with no premedication and using the subcutaneous route.

LBTP1815 | Seizing the moment: Benefits of immediate in-office penicillin oral challenge in the management of suspected penicillin allergy

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Background: Ten percent of the population identify as penicillin allergic, however only 10% of this population is referred for allergy testing. Assessment of true penicillin allergy requires both allergy testing and drug provocation for confirmation. Without assessment, alternate expensive, broad spectrum antibiotics are unnecessarily prescribed.

Method: A retrospective review of penicillin allergy testing in a community allergy clinic was conducted from June 2016 to February 2019. Presentations varied from generalized rash to anaphylaxis. Patients underwent intradermal testing to Benzylpenicilloyl polylysine, minor determinant mixture (MDM), penicillin G and ampicillin as per standard protocol. Patients with positive intradermal test were diagnosed as penicillin allergic. Patients with negative intradermal test were challenged with amoxicillin at home or in office. Patients who underwent home challenge were asked to communicate results of home challenge after 5 days. Patients who underwent in-office challenge were given 25 and 225 mg of amoxicillin with a 30 and 45-minute monitoring period after each dose respectively, immediately after penicillin skin testing.

Results: Of 396 patients (mean age 20.2), 31 (7.83%) and 365 (92.17%) patients had positive and negative intradermal tests, respectively. Of the 365 patients with a negative intradermal test, 185 patients underwent a home challenge, and 173 patients underwent an in office challenge. The majority of home challenges were not completed with no follow-up communication of result (107/185, 58%), resulting in an incomplete diagnosis. Of the remainder of completed home challenges, the majority were tolerant (75/78, 96.15%) with 3/78 (4%) developing a delayed rash. In contrast, in-office challenges were safely completed and tolerant in the majority of patients (171/173, 99%) with only 1% (2/173) developing in-office rash. Patients with serum sickness who tested negative were not challenged (7/365).

Conclusion: Intradermal testing and immediate in-office amoxicillin oral challenge proved to be safe and most effective in confirming penicillin tolerance and ruling out allergy. The majority of home amoxicillin challenges in the same population remained undiagnosed, and an ineffective use of consulting resources, demonstrating the benefit and efficiency for immediate in-office challenges.

LBTP1816 | NSAID hypersensitivity: Experience from Vilnius University Hospital Santaros Klinikos

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Background: Nonsteroidal anti-inflammatory drugs (NSAID) are among the most frequently used drugs and known to cause hypersensitivity reactions. Oral provocation tests are a gold standard when hypersensitivity reactions to NSAID's are suspected.

Method: Patients with suspected NSAID hypersensitivity consulted in Vilnius University Hospital Santaros Klinikos Pulmonology and Allergology outpatient department in 2017 and 2018 were included in this study. The aim of this study was to find out the most common NSAID, causing hypersensitivity reactions; analyze if there is a coherence between NSAID's hypersensitivity reactions and the presence of atopy.

Results: 77 patients were challenged with 90 suspected causative and alternative NSAID oral provocation (OP) tests. 57 of our patients were women, 20-men. The age average was 47.1 years. The most common NSAID's, which caused hypersensitivity reactions were acetylsalicylic acid—50% (10 positive tests of 20), diclofenac—27.27% (3 positive tests of 11), meloxicam 7.3% (3 positive tests of 41). We found out that atopy had no impact on test positivity.

Conclusion: The most common NSAID medication, related to drug hypersensitivity reactions was acetylsalicylic acid (50%). No relationship between atopy and hypersensitivity with NSAID was found.

LBTP1817 | Cross reactivity to cephalosporins and carbapenems in penicillin allergic patients

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Background: Penicillins are the antibiotics that most frequently cause IgE-mediated allergic reactions. The allergy to these drugs causes the restriction, in many cases unnecessary, of the use of other beta-lactams. In order to study the cross-reactivity between penicillins and other beta-lactams we tested the tolerance to Cefuroxime, Ceftriaxone and Imipenem in 134 patients with immediate allergy to penicillins.

Method: In the 134, skin tests were performed with minor determinant mixture (MDM), Penicilloyl polylysine (PPL), Amoxiciline, Cefuroxime, Ceftriaxone plus the involved drug and in 40 patients with Imipenem, following the recommendations of the ENDA. In 122 patients, specific IgE in vitro (sIgE) was performed with Penicillin G, Penicillin V, Ampicillin and Amoxicillin (ThermoFisher). Oral exposure tests were performed with Cefuroxime (500 mg) and IV with Ceftriaxone (1 g) and Imipenem (1 g).

Results: We studied 134 patients (81 women) (age 51 ± 14 years), who presented anaphylaxis (n = 45) or urticaria/angioedema (n = 89) <1 hour after the administration of penicillins (123 patients Amoxicillin or Amoxicillin-Clavulanic, 6 cases Penicillin G, 2 Ampicillin, 2 unknown and 1 Amoxicillin and Cefuroxime). 129 patients had positive skin tests with beta-lactam antibiotics (1 Cefuroxime, 1 Ceftriaxone, 24 PPL, 8 MDM, 108 Amoxicillin). 36 patients presented Positive sIgE (>0.35 KU/L) (26 Penicillin G, 26 Penicillin V, 22 Ampicillin, 29 Amoxicillin).

5 patients with negative skin tests and specific IgE presented positive oral challenge test with Amoxicillin.

Challenge test was performed in 133 patients with Cefuroxime, 123 patients with Ceftriaxone and 36 patients with Imipenem, all of them with negative skin tests with these drugs, with tolerance in all cases.

Conclusion: In patients with immediate allergy to penicillins and negative skin tests with Cefuroxime, Ceftriaxone and Imipinem, these drugs are a safe alternative and can probably be recommended safely without the need to check their tolerance.

LBTP1818 | Immediate HyperSensitivity (IHS) to NSAIDs: Which Aspirin Challenge Test (ACT) for which patient?

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Background: ACT is proposed to patients suspected of IHS to NSAIDs. Several protocols have been published up to the EAACI recommendations in 2007. The aim of our work is to validate our ACT protocol in these patients based on their specific clinical profile.

Method: Retrospective study of our ACT protocol in our department from 2015 to 2018. Our protocols respect a delay of 1.5 hour between each dose. Performed in single blind, the dose progression is pragmatic, validating cumulative anti-aggregating, analgesic or anti-inflammatory doses (165-400-1000 mg). Depending on the clinical profile of the patients, the protocol starts with lower doses (10-25-50-90 or 10-75-90 mg).

Results: 162 patients were included. ACT confirmed non-immunological IHS to the NSAISs in 46 patients. Among them, we distinguished 3 groups according to their predisposing factors: bronchial or ENT (45% of the patients), urticarial (9%), the rest free of these risk factors. Respiratory history appears as a risk factor (63% of the positive ACT). In 43% of these cases, the reaction was observed more than 60 minutes after the last dose. The initial reaction seems to be predictive of the results of ACT, which is positive in 45% of cases if asthma was described by the patient in the initial reaction, 42% in case of involvement of at least two organs and 18% in case of isolated urticaria. Cumulative reactive dose is ≤165 mg for 76% of the respiratory group, 75% of the urticarial group and 54% of the group without risk factors. 6 patients responded to the cumulative dose of 1.5 g. There was no serious adverse event. 20 patients had severe reactions to ACT: 70% were considered at risk and had a protocol starting with doses lower than 165 mg; and indeed 60% had a reactive dose of <165 mg.

Conclusion: ACT is indispensable for removing unnecessary evictions from NSAIDs. The bronchial or ENT histories of patients are predictive of positive ACT. Starting ACT with lower doses in at-risk patients allows to confirm IHS by limiting severe clinical reactions. The delay of 1.5 hour between two doses is a necessary to guarantee the safety of ACT and ensure the tolerance of an anti-aggregating dose. ACT should be conducted up to the cumulative dose of 1.5 g to ensure the absence of non-immunological hypersensitivity to NSAIDs.

LBTP1819 | Tolerance to Iopamidol in Iomeprol allergic patients

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Background: Adverse reactions to iodinated contrasts are frequent, but in many cases it is not possible to demonstrate a specific hypersensitivity mechanism. In patients with adverse reactions to these contrasts, the alternative contrast to be used safely is not quite well defined. With the objective to determine the tolerance to other iodinated contrasts, we have studied 23 patients with demonstrated allergy to Iomeprol.

Method: 23 patients with allergy to Iomeprol were included: 14 with immediate hypersensitivity (<1 hour after its administration) and 9 with late hypersensitivity (more than 1 hour after its administration). In 23 cases, the elapsed time between reaction and diagnosis was shorter than 6 months.

In these 23 patients, skin tests were performed with Iomeprol, Iopamiro and Iopramide, according to Clinical Practice Guideline for Diagnosis and Management of Hypersensitivity Reactions to Contrast Media from SEAIC, performing the readings after 20 minutes in patients with immediate reactions and after 48 hours in case of patients with late reactions. Intravenous exposure test was performed with 100 mL of alternative contrast used.

Results: IMMEDIATE HYPERSENSITIVITY: 4 patients presented anaphylaxis and 10 presented urticaria/angioedema with Iomeprol. 12 patients had skin tests positive to Iomeprol and negative to Iopamidol and Iopramide. Two patients had negative skin tests to the three iodinated contrast but positive challenge test with Iomeprol (urticaria). All patients tolerated intravenous exposure to Iopamidol. 7 Computerized axial tomography scans performed to those patients after the study conduct that received Iopamidol were well tolerated. LATE HYPERSENSITIVITY: 9 patients developed widespread cutaneous exanthemas after administration to Iomeprol. 6 patients presented positive skin tests with Iomeprol and negative to Iopamidol and Iopramide. Two patients presented negative skin tests and positive challenge test with Iomeprol. Of the 9 patients, 7 tolerated exposure IV with Iopamidol and two patients did not tolerate exposure with Iopamidol, presenting cutaneous exanthema. Three CT scans performed on these patients, after the allergological study in which Iopamidol was used, were well tolerated.

Conclusion: In patients with immediate and late allergy to Iomeprol, Iopamidol is a safe alternative being tolerated by 14 (100%) of patients with immediate allergy and 7 (78%) of patients with late allergy.

LBTP1820 | The use of specific IgE, including specific IgE to penicillin minor determinants, in the diagnosis of penicillin allergy

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Background: In a Danish allergy clinic, testing for specific IgE is used as first line investigation in the diagnosis of immediate type allergy to penicillins. Detectable specific IgE to one or more penicillins combined with a history suggestive of allergy is considered diagnostic. We use the commercially available tests for specific IgE to benzylpenicillin, phenoxymethylpenicillin, ampicillin and amoxicillin, and since 2010 a research only test for IgE to "penicillin minor determinants" (MD) has been included (ImmunoCAP, Phadia AB, Sweden). There are no previous publications on the use of specific IgE to MD. The aims of this study were to calculate the proportion of patients who only tested positive for specific IgE to MD and to describe the clinical characteristics of these patients.

Method: Specific IgE results from 2010 to 2017 were collected retrospectively from the laboratory database, including data from 11 051 patients with suspected penicillin allergy. In 6537 patients all five analyses were performed. Clinical characteristics of patients only testing positive for IgE to MD during 2013-2017 (n = 66) were retrieved from the medical notes.

Results: There were 347 out of 6537 (5.3%) patients with positive IgE tests in the five-analyses-group, vs 148 out of 4514 (3.3%) in the group without MD IgE test ($P < 0.0001$). In 86 (25%) of the IgE positive patients specific IgE MD was the only positive test. Culprit drug was Dicloxacillin/flucloxacillin in 11 (17%) and phenoxymethylpenicillin in 38 (58%) patients. Twenty-five (38%) had reactions <2 hours after drug intake; 56 (85%) had a rash incl. urticaria and 17 (26%) had symptoms from airway and/or circulation. Six (9%) patients received adrenaline treatment and 47 (71%) received antihistamines ± steroids.

Conclusion: In a large cohort of patients with suspected penicillin allergy significantly more IgE positive patients were identified if specific IgE to MD was included in the testing. This test identifies 1 in 4 of the total number of specific IgE positive patients, and this group includes a high proportion of cases with moderate to severe immediate reactions. Future studies should compare the performance of this new IgE test with existing skin tests for penicillin MD.

SUNDAY, 2 JUNE 2019
LB TPS 02
IMMUNE MECHANISM IN IMMUNOLOGICAL DISEASES

LBTP1822 | Local skin infiltration of memory T cell clones in acute allergic contact dermatitis includes nickel-specific CD4+ T cells identified in blood

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Background: Acute allergic contact dermatitis (ACD) to nickel (Ni) is characterized by massive T cell infiltration into the inflamed skin. However, the proportion of individual antigen-reactive T cell clones which are locally expanded in human skin remains unknown. To address this question we compared the total and Ni^{2+}-specific T cell receptor (TCR) repertoires of skin and blood T cell populations from a patient with acute ACD to Ni.

Method: RNA was isolated from healthy and ACD skin biopsies as well as from 50 000 to 100 000 naïve (CCR7+ CD45RO-) or memory (not naive) CD4+ and CD8+ T cells from blood of a patch tested patient (72 hours after patch test application, patch test ++). In addition, 272 Ni-reactive CD154+ CD4+ memory T cells were sorted after incubation of peripheral blood mononuclear cells (PBMCs) with 200 µmol/L $NiSO_4$ for 7 hours. From all samples a- and b-chain TCR mRNA was transcribed with gene-specific primers, a SMART adapter with unique molecular identifier was incorporated for improved error correction and count of transcribed cDNAs. TCR libraries were Illumina sequenced after two rounds of PCR and sequences analyzed with MiGEC, MiXCR, VDJtools and R.

Results: For ACD skin we obtained 653 217 b-chain TCR sequences representing 138 524 clones, results for the a-chain were similar. Of all b-chain sequences, 26% and 39% were assigned to blood CD8+ and CD4+ memory T cell clones, respectively. Of these, only 23 CD8+ (out of 6088) and 103 CD4+ (out of 20 876) clones had a 4-fold higher frequency in ACD skin compared to blood and ACD count numbers ≥100 indicating relevant local proliferation. Clones that were not shared between skin and blood and naïve T cells had only low individual sequence counts (<<100). The enriched and putatively ACD-relevant CD4+ T cell clones comprised 13 out of 67 Ni-specific CD4+ memory T cells clones identified in blood. A part of the relevant clones was also present in healthy skin (30% of CD8+, 67% of CD4+ and 15% of Ni-specific clones) arguing for a contribution of both skin-resident and freshly migrating CD4+ and CD8+ T cell clones to the inflammatory ACD reaction.

Conclusion: Combining high throughput ab TCR sequencing and FACS analysis we identify a small fraction of CD4+ and CD8+ memory T cell clones of the inflammatory T cell infiltrate that proliferates locally in ACD skin. It includes Ni-specific CD4+ memory T cells identified in blood arguing for the identification of skin-relevant Ni-specific CD4+ T cell clones by blood-based assays.

LBTP1823 | Direct quantification of nickel-specific naïve and memory Th cells in peripheral blood of allergic and non-allergic donors

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Background: Nickel (Ni) allergies may affect about 9% of the European population which makes Ni a frequent common single cause of allergic contact dermatitis (ACD), the clinical manifestation of the allergic reaction. ACD is mediated by specific memory T cells that have so far been semi-quantified by proliferation-based in vitro cultures or cytokine secretion assays which only detect subpopulations of T cells. Our aim is to develop a more quantitative in vitro assay which represents an unmet need for the clinical and therapeutic management of ACD.

Method: We adopted a recently developed method based on short-term unbiased expression of CD154 (CD40L) by antigen-specific naïve and memory Th cells to directly quantify Ni-specific Th cells in peripheral blood mononuclear cells (PBMCs) from allergic and non-allergic donors by flow cytometry. Activated CD154+ Th cells were further characterized for cytokine, activation, and migratory markers. Single CD154+ memory Th cells were sorted, expanded, and restimulated with different antigens.

Results: We stimulated PBMCs from non-allergic (n = 12), "long-term" (non-acute) allergic (n = 8), and acute Ni-allergic donors (n = 11) with Ni (200 µmol/L $NiSO_4$) or control antigens. Non-allergic and "long-term" allergic donors had similar frequencies of Ni-specific CD154+ Th cells in both the naïve (median 0.1%) and memory (median 0.1%) compartments. Interestingly, donors with

recent allergic reactions showed significantly increased memory frequencies (median 1.0%) indicating acute effector Th cell responses These cells comprised an increased proportion of cutaneous lymphocyte-associated antigen (CLA) positive and Ki67+ cells compared to cytomegalovirus pp65-specific memory Th cells and the total pools of memory Th cells, respectively. Cytokine secretion seemed donor-associated with either more IL-17 or IL-4 expressing cells among the Ni-specific CD154+ Th cells. Ni-specific T cell activation was inhibited by major histocompatibility complex (MHC) blocking antibodies and individual in vitro expanded T cell clones were specifically restimulated with Ni which argues for T cell receptor-mediated interactions.

Conclusion: Our results suggest that acute Ni-specific effector Th cell responses may be quantified and characterized directly ex vivo from peripheral blood by CD154 expression which might represent in the future a new diagnostic tool to diagnose Ni and other metal contact allergies.

LBTP1824 | The French side of the Global Angioedema Registry in 2019

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Background: Angioedema is a recurrent localized swelling of cutaneous and mucosal tissues. Potentially life-threatening, creates temporary disability which deteriorates quality of life. Seven inherited or acquired forms of angioedema without wheals are yet classified, included hereditary or acquired C1 inhibitor deficiency (C1-INH-HAE and C1-INH-AAE). Last year, the French angioedema reference center network (CREAK) joined the registry of angioedema without wheals (Cloud-R HAE). Here we present the contribution of the Grenoble Alpes University Hospital (CHUGA) to this disease registry.

Method: Study population is composed of C1-INH-HAE/AAE patients with a proved diagnosis. The following items are collected: patients' personal-demographic data, clinical/laboratory/genetic characteristics, major comorbidities, treatments (prophylaxis/acute attacks). As from Cloud-R HAE structure, patients can directly provide information on angioedema attacks and their treatment through a dedicated electronic app, web connection or paper support, which is then transferred into the registry at CHUGA.

Results: Since February 2018, 23 C1-INH-HAE patients from Grenoble Alpes University Hospital (CHUGA) outpatient clinic have been included (informed consent signed). Seventeen per cent of them provide prospective data on angioedema attacks. Within C1-INH-HAE, median age is 44 years (range 12-72), sex-ratio: 6/17 (M/F). Due to the frequency of symptoms, 52% of them are on long-term prophylaxis (LTP) with tranexamic acid (8%), danazol (8%), C1-Inhibitor (C1-INH) concentrate or C1-INH recombinant (16%) and 55% of women with progestin. Since February 2019, 8 additional french centers join the registry (Cloud-R HAE) and included 13 more patients.

Conclusion: Angioedema registry gives the possibility to gather information to define natural history of angioedema and to evaluate treatment efficacy in real life. The possibility that data from single countries merge into a global structure facilitates improvement and dissemination of the knowledge on this rare disease and its treatment.

LBTP1825 | Potential immunomodulatory effect of the house dust mite microbiome

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Background: The HDM microbiome might have an immunomodulatory role in allergic diseases owing to its ability to generate microbial-associated molecules, such as lipopolysaccharides and lipoteichoic acid. In this study, a 16S rRNA amplicon analysis using high-throughput sequencing technology was performed to determine the microbiome of *Dermatophagoides farinae*.

Method: Mites were cultivated for 6 weeks with or without ampicillin powder. 16S rRNA amplicon (V3_V4) analysis using high-throughput sequencing technology was performed with Miseq (Illumina). 16S rRNA cloning, cultivation of mite homogenates, and several stains were performed.

Results: Over 99% of reads were assigned to *Bartonella* and *Enterococcus*. this finding was supported by 16S rRNA cloning, cultivation of mite homogenates. *Enterococcus faecalis* were distributed throughout the intestine of *D. farinae* and were densely gathered in the stool at the hindgut region. *Bartonella* spp. were detected in the hemocoel. Antibiotics were applied to the mites to determine if the microbiome of them affects the allergy induction. The amount of total bacteria and the endotoxin concentration in mites were reduced. However, allergen (Der f1) concentration was not changed by antibiotics treatment. When the extract of antibiotics-treated mites was administered to the human bronchial epithelial cell line (BEAS-2B), the secretion of IL-6 and IL-8 was significantly lowered.

Conclusion: We found that *Enterococcus* and *Bartonella* are the core microbiome of *D. farinae* and that a change in the microbiome could affect the ability of the mite to induce allergic disease.

LBTP1826 | Hereditary angioedema with normal C1 Inhibitor with plasminogen (PLG) mutation: Phenotype characteristics of an additional five-generation affected family in the French cohort

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Case report: In HAE with normal C1 Inhibitor level (nC1-INH-HAE) some mutations have been described as F12 gene mutation (Bork et al, Deroux et al) and more recently a missense variant in angiopoietine-1 gene (ANGPT1, c.807G>1, p.Ala119Ser) (Bafunno et al) and a new mutation affected the plasminogen (PLG, NM_000301.3) gene corresponded to the mutation c.988A>G in exon 9. This mutation has been identified by Bork et al in 60 nC1-INH-HAE patients belonging to 13 different German families with a particular PLG-HAE phenotype described in this cohort. Belbezier et al, reported also in three additional PLG-HAE families a particular clinical phenotype such angioedema attacks preferentially located on tongue, face and laryngeal area confirming the results observed in other studies since then (Bork et al, Dewald et al). The penetrance is still not well known. Among the PLG-HAE French cohort we have identified an additional five-generation affected family at Grenoble Alpes University Hospital. For the 2 patients with PLG-HAE mutation, C1 Inh antigen and function are normal, and no FXII associated mutation found. Regarding the phenotype characteristics, PLG-HAE patients preferentially developed face and tongue swelling. The probant patient is a 90 years old woman who experienced angioedema since more than 30 years. Angioedemas' location is mainly tongue but also lips, face and pharyngeal. The frequency varies from every 2 weeks to every 5-6 months without any identified trigger factors. Angiodemas' duration varies also from few hours to 3 days. During her 2nd pregnancy the symptoms worsened with more frequent tongue swelling which means estrogen trigger is possible.

Five more family members among five generation present the same clinical phenotype with recurrent tongue swelling but the PLG mutation has not been tested for them yet: probant's father, probant's sister, niece, grand niece and probant's grand grand daughter. We have no genetic data for probant's father who is dead. Probant's sister is not genetic tested yet but she experienced the same recurrent tongue swelling symptoms as her sister.

Plasminogen activity has been tested for the probant patient and a low value (65% of the reference value) has been found. PLG mutation and activity need to be tested for other affected and non affected patients in this family, C1 Inhibitor antigen and activity dosage checked, to obtain more data regarding the PLG-HAE phenotype characteristics and also the penetrance of the disease.

LBTP1828 | Waldmann's disease—A case report

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Background: Waldmann's disease is a rare disorder characterized by primary intestinal lymphangiectasia (PIL), dilated intestinal lacteals resulting in lymph leakage into the small bowel lumen and responsible for protein-losing enteropathy (PLE) leading to lymphopenia, hypoalbuminemia and hypogammaglobulinemia. The first main symptom is predominantly limb edema.

Method: We present a 6-years old girl suffering from this disease. She has congenital lymphedema (LE) of upper right limb which was confirmed by indirect lymphoscintigraphy at her age of 4 months. Genetical consultation at her age of 2 months regarded LE as an isolated characteristic, her karyotype is 46XX. Her first PLE occurred when she was 6 years old. She was thoroughly investigated by the surgeons and then referred to gastroenterologists and immunologists.

Results: We present biochemical, immunological and imaginative parameters of our patient and compare these data with the current available literature sources about this rare syndrome. Immunological abnormalities involve both the B-cell and T-cell lineages. The B-cell defect is characterised by low immunoglobulin levels. The T cell-defect and T-lymphopenia is also present. Furthermore, PILs' patients peripheral blood samples contain extremely low counts of CD4+ T helper cells. This feature is also present in our patient. We discuss also differential diagnosis of Waldmann's syndrome and management and treatment .

Conclusion: Waldmann's disease occurring rarely might be a strange and hidden diagnosis. Although the patients present at first sight by limb lymphedema and do have immunological abnormalities, their main problem is the PIL resulting in PLE. The management of these patients should be operated by gastroenterologists.

LBTP1829 | Innate immune interactions of human rhinovirus-16 and grass pollen in grass pollen allergic adults

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Background: Sensitization to aeroallergens such as grass pollens (GP) have shown to be associated with increased risk of developing respiratory virus-induced wheezing and asthma exacerbations in children. Studies have revealed a counterregulatory effect on the innate antiviral response following co-exposure of virus and

allergen, corroborated by results of our preliminary studies. We aim to further elucidate these innate immune interactions in adults with human rhinovirus-16 (RV-16) and *Paspalum notatum* pollen (Bahia grass; BaGP), a relevant grass pollen allergen source in Queensland.

Method: Participants (GP-allergic, n = 23; non-atopic, n = 22) were recruited with informed consent in Queensland. Clinical history and skin prick test (SPT) were evaluated. PBMC cultures were treated as follows; no treatment, RV-16 only, RV-16 + BaGP, and BaGP only. RV-16 was applied at a multiplicity of infection of 1 and BaGP aqueous extract was applied at 30 μg/mL. IP-10 and IL-6 induction was measured by ELISA in culture supernatants at 24 hour. Induction of IFN-β, MxA, OAS, IL-23 p19, IL-12 p35 and 40 transcription was measured by RT-PCR in 6 hour cell pellets.

Results: IP-10 production was induced by RV-16 and significant inhibition was observed following co-incubation of BaGP regardless of GP-allergy status. IL-6 was induced strongly by BaGP but co-incubation with RV-16 had no effect on IL-6 induction by BaGP. MxA, OAS and IFN-β gene expression was induced by RV-16, but only MxA gene expression was inhibited by co-exposure with BaGP in allergic subjects. IL-23 p19 gene expression induced by RV-16 was significantly lower for allergic subjects compared to healthy subjects.

Conclusion: The innate antiviral response induced by RV16 in PBMC cultures was inhibited by co-incubation with BaGP in GP-allergic and non-allergic groups. This outcome indicates a role for grass pollen allergen exposure in modulating respiratory virus induced inflammation.

LBTP1830 | Venom immunotherapy causes serum protein/peptide profiles changes

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Background: Venom immunotherapy (VIT) is the most potent way to reduce the risk of anaphylaxis following *Hymenoptera* sting. In order to better understand the mechanism and impact of this treatment on the human organism, serum proteomic patterns obtained from *Hymenoptera* venom allergic patients undergoing VIT were studied and compared. For this purpose, an advanced analytical-bioinformatic method was proposed.

Method: Serum samples were derived from 22 allergic patients 1 day before starting VIT and on the 1st day of treatment, then on the 11th, 90th and 180th day. Control group was constituted by patients diagnosed with *Hymenoptera* venom allergy but not qualified to VIT. Samples from controls were collected twice, the second one 90 days after the first collection. Serum protein/peptide profiles were obtained with MALDI-TOF/TOF mass spectrometer. The spectra, after processing in the R programming environment, were submitted to statistical analysis in MetaboAnalyst software.

Results: A significant increase of IgG4 level was measured in patients undergoing VIT, whereas, in the control group, no statistically significant differences were observed in time. The non-parametric statistical analysis of serum proteomic profiles obtained 1 day before starting VIT with those acquired on the 1st, 11th and 90th day of treatment revealed changes within them. Among the discriminative peptides, parts of complement C3, complement C4A, mucin 3A and fibrinogen alpha chain were identified. However, the comparison of the proteomic patterns obtained from patients 1 day before VIT and on the 180th day showed no statistical differences. The differences between serum protein/peptide profiles of the control group obtained in two-time points were also negligible.

Conclusion: The results of this study revealed changes in serum protein/peptide patterns during VIT detectable until the 90th day after starting the treatment. Lack of differences between profiles derived from patients 1 day before starting VIT and on the 180th may result from the applied protocol of immunotherapy, in which from 90th day patients received only maintenance dose every 4 weeks.

Joanna Matysiak & Eliza Matuszewska contributed equally to this work.

LBTP1831 | Altered protein expression patterns of Blattella germanica by antibiotics show decreased IgE reactivity with allergic patients

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Background: Cockroaches bodies produce allergens that bind to IgE antibodies and play roles in allergic diseases. Recent studies have shown that arthropods such as house dust mite by antibiotics reduce the allergic response. In this study, we aimed to demonstrate whether antibiotics can reduce allergens of *Blattella germanica*.

Method: We reared *Blattella germanica* treated with ampicillin for 3 months. SDS-PAGE was performed to examine protein expression patterns. The specific IgE level to cockroach extract was detected using sera of cockroach allergic patients by ELISA.

Results: Our results showed that protein patterns of *Blattella germanica* were altered by ampicillin treatment. Most protein bands smaller than 43 kD were decreased and most proteins larger than 72 kD were increased by treatment of ampicillin. The specific IgE levels to cockroach reared under ampicillin were significantly reduced in certain patients (2 out of 14) when compared to the control.

Conclusion: We showed that antibiotics may alter protein patterns in *Blattella germanica*. We need further study to identify the altered proteins and their allergenicity.

LBTP1833 | Genetics variants in the TLSP locus here associated with eosinophilic esophagitis in Spanish population

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Background: Eosinophilic esophagitis (EoE) is an antigen-driven disease mediated by an abnormal immune T helper 2 (TH2)-type response. Thymic stromal lymphopoietin (TSLP) is a cytokine produced by esophageal epithelial cells, which acts by driving dendritic cells (DCs) towards a TH2 response. TSLP being identified as a major candidate gene involved in the pathogenesis of the disease by genome-wide association studies. Objective: To replicate the association of the TLSP gene with EoE in a Spanish population.

Method: Six tag single nucleotide polymorphisms (tSNPs) selected in candidate gene TSLP were genotyped in 218 EoE patients and 376 non-EoE controls (healthy ethnically matched bone marrow donors, were selected). All patients were recruited at two Spanish hospitals: Hospital Universitario Virgen del Rocío (Sevilla) and Hospital General de Tomelloso (Ciudad Real). Genomic DNA was extracted from blood leukocytes using QIAmp DNA Mini Kit (Qiagen, Hilden, Germany) according to the manufacturer's recommendations and stored at −20°C. Allele frequency distributions were compared using the χ^2 test and a corrected *P*-value (p_c) was calculated from 10 000 permutations (Haploview program). Skin prick-test was carried out in EoE patients with a panel of 17 common aeroallergens and 22 plant and animal-derived food.

Results: 218 adult patients with EoE (170 males and 48 females; mean age at diagnosis 35.4; range 9-74) and 376 healthy ethnically matched bone marrow donors, were selected. Five tSNPs located in the TSLP locus were significantly associated with EoE. Since the prevalence of EoE in males is higher than in females, a gender-stratified analysis of EoE patients and controls was carried out to determine whether TSLP variants contribute to this gender bias: significant differences remained unchanged between patients and controls in the male group, with only rs2289276 polymorphism in TSLP gene being not associated after p-correction ($P = 0.013$ and $p_c = 0.065$). Regarding female patients, no significant differences in the distribution of alleles were found, with a similar trend in the distribution to that observed in the male group; the TSLP gene polymorphism rs10062929 was found to be associated before p-correction ($P = 0.016$). Finally, no association between TSLP and sensitization to food or inhalant allergens was found.

Conclusion: We have replicated the association of the TSLP gene with EoE. TSLP variants don't contribute to gender bias.

LBTP1834 | Genetics variants in the TLR3 locus are associated with eosinophilic esophagitis in Spanish population

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Background: Eosinophilic esophagitis (EoE) is an antigen-driven disease mediated by an abnormal immune TH2 response. Disease risk variants and an altered esophageal transcriptional profile underlie the genetic background of EoE.

Objective: To investigate gene polymorphisms associated in regulating immune responses leading to disease susceptibility.

Method: Twenty-one tag single nucleotide polymorphisms (tSNPs) selected in four candidate genes (TLR3, TLR4, FOXP3 and FLG) were genotyped in 218 EoE patients and 376 non-EoE controls (healthy ethnically matched bone marrow donors, were selected). All patients were recruited at two Spanish hospitals: Hospital Universitario Virgen del Rocío (Sevilla) and Hospital General de Tomelloso (Ciudad Real). Genomic DNA was extracted from blood leukocytes using QIAmp DNA Mini Kit (Qiagen, Hilden, Germany) according to the manufacturer's recommendations, and stored at −20°C. Allele frequency distributions were compared using the χ^2 test and a corrected *P*-value (p_c) was calculated from 10 000 permutations (Haploview program). Skin prick-test (SPT) were carried out in EoE patients with a panel of 17 common aeroallergens and 22 plant and animal-derived food.

Results: SPT were performed in the overall group of 218 patients with EoE revealed aeroallergen and food sensitization in 72.22% and 61.46% of them, respectively.

The successful rate of genotyping was >98% for all the SNPs included, and the study population was found to be in Hardy-Weinberg equilibrium for all the polymorphisms analyzed ($P > 0.05$). No statistically significant differences were found between EoE patients and control subjects in the distribution of the allelic frequencies of any of the SNPs of TLR4, FOXP3 and FLG loci. However, one tSNP located in the TLR3 locus were significantly associated with EoE. TLR3 locus was found to be associated with aeroallergens sensitization and food allergy in EoE patients: the rs11721827C allele was more frequently found among EoE patients sensitized to aeroallergens (9.4% vs 1.1%, OR = 9.67, $p_c = 0.025$), and rs5743303T allele was found as a protective factor for food sensitization (17.5% vs 28.5%, OR = 0.53, $p_c = 0.048$).

Conclusion: This study describes the TLR3 gene as a novel genetic susceptibility locus for developing EoE for the first time.

The TLR3 gene was found to be associated with aeroallergens and food sensitization in EoE patients.

LBTP1835 | Identification of the major allergenic proteins of Bombyx mori moth's wings

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Background: Moths are a significant source of aeroallergens, which might trigger symptoms of asthma and allergic rhinitis in predisposed subjects, after home or occupational exposure. High prevalence of sensitization to *Bombyx mori* extract was demonstrated in individuals with allergic respiratory diseases. There are no studies on these moth species allergens involved in allergic respiratory reactions. The aim of this study was to determine the major allergenic proteins of *Bombyx mori* moth's wings responsible for allergic sensitization of individuals with rhinitis and/or asthma.

Method: We studied 36 patients submitted to skin prick tests using *Bombyx mori*'s wings and other six aeroallergens standardized extracts, as well as blood sample collection. They were divided into three groups: group 1 consisted of 21 allergic subjects whose skin prick tests were positive to *Bombyx mori* extract, group 2 consisted of 8 individuals whose skin prick tests were positive to mite extract and group 3 consisted of 7 non allergic subjects whose skin prick tests were negative, as controls. We performed Western blot using anti-IgE antibodies with moth's wings extract, which was analysed by mass spectrometry as well. Written informed consent was obtained from all participants.

Results: Among the 21 subjects from group 1, 19 reacted to moth extract by *Western blot*. All reacted to a protein at 80 kDa, five other bands (66, 50, 45, 37 e 30 kDa) were identified in more than 50% of individuals tested, considered major proteins. From 8 participants of group 2, seven showed reactivity to moth extract by Western blot. Sera samples from healthy individuals did not react to moth extract. Based on research databank of molecular mass already described to *Bombyx mori*, it was possible to identify 5 from 6 major proteins reactive on immunoassays. The 80 kDa protein, seen in all reactive participants from group 1 and in none of the patients from group 2, is a potential specific allergen from moth's wings. More studies are necessary to better characterize this protein. The 45 kDa protein, visualised in 84.2% of the group 1 patients, was identified by mass spectrometry as vitellogenin.

Conclusion: This was the first study to highlight the major allergenic proteins of *Bombyx mori* moth's wings in individuals with allergic respiratory diseases. The ones at 80 and 45 kDa are specific allergenic proteins of this moth species that require more studies to better understand its clinical importance on patients with asthma and/or rhinitis.

LBTP1836 | The use of omalizumab for dermatologic manifestations of Hyper-IgE Syndrome—Two case reports

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Case report: We described two cases of Hyper-Immunoglobulin E (IgE) Syndrome. The first concerns a 33 year old male diagnosed with STAT3 mutation, with a history of severe recalcitrant eczematous dermatitis, onychomycosis and multiple recurrent respiratory and cutaneous infections since childhood requiring repeated courses of antistaphylococcal antibiotics and antifungals. At the time of observation he held a poor control of his skin disease despite a daily dose of 80 mg of prednisolone. In order to control cutaneous symptoms, to diminish his high levels of IgE (11.802 kU/L) and his need for corticotherapy, omalizumab therapy was initiated on February 2018 with 375 mg every 2 weeks. Evaluation after 1 year of omalizumab treatment showed a significant improvement in skin lesions and pruritus, allowing a reduction to an intermittent dose of corticosteroids.

The second describes a 38 year old male with a heterozygous variant of the DOCK8 gene and IgE levels of 1435 kU/L. He presented a history of recalcitrant eczematous dermatitis with intense pruritus, folliculitis, frequent skin abscess formation, psychomotor impairment, intellectual disability and Hodgkin Lymphoma (14 years ago). At the time of observation he retained shortness of breath and wheezing without response to medication, severe recalcitrant eczematous dermatitis, intense pruritus and frequent cutaneous infections requiring daily corticotherapy and multiple courses of antibiotherapy. He started therapy with omalizumab in April 2018 with 300 mg every 2 weeks. After 10 months of treatment, he maintained his skin lesions but showed a slight improvement of pruritus, achieving a small decrease of his corticotherapy dosing. Both patients gave informed consent for publication regarding all information approached in this work.

Conclusions: Different response to Omalizumab between two cases of Hyper-IgE syndrome with distinctive types of mutations causes a deliberation on the use of this therapy on a case-by-case basis.

LBTP1837 | Omalizumab treatment in children with chronic spontaneous urticaria: Efficacy and safety

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Background: Chronic spontaneous urticaria (CSU) is defined as spontaneous occurrence of wheals and/or angioedema for ≥6 weeks.

Omalizumab is useful as add-on treatment in patients unresponsive to high doses of second generation antihistamines. The aim of this study was to evaluate the efficacy and side effects of omalizumab treatment in children with refractory CSU.

Method: CSU patients aged 12-18 years-old with the diagnosis of symptomatic CSU and unresponsive to the classical treatment were included to the study. All patients had an urticaria-activity-score (UAS7) of 16 or greater and they were treated with omalizumab 300 mg every 4 weeks. The UAS7 scores were recorded monthly. Complete response, partial response and no response was defined as more than 90%, 30% to 89% and <30% reduction in symptoms respectively. The relapse was considered to be the re-appearance of CSU symptoms after the end of treatment.

Results: A total of 29 patients were evaluated. The patients were predominantly females (n = 16;55%). The median age and symptom onset age of the patients were 15.2 (IQR,12.8-16.5) years and 14.0 (IQR,11.8-15.9) years, respectively. The median duration of urticaria was 8 (IQR,4-24) months. Eleven (37.9%) patients had angioedema and 10 (34.5%) patients had concomitant allergic diseases. Autolog serum skin testing was positive in 2/10 (20%) and SPT was positive in 5/10 (50%) of patients. The median age at the beginning of treatment with omalizumab was 15.4 (IQR;12.9-16.9) years. The median symptom duration was 12 (IQR;6.5-27.5) months before the omalizumab treatment. Twenty-eight (96.5%) of the patients (89.6% complete, 6.9% partial) achieved response with omalizumab however one patient was non-responder (3.5%). Adverse effect was observed in one (3.4%) patient as angioedema after 3rd dose of omalizumab. Twenty-three patients who completed the treatment were followed up for median 18 (IQR,13-27) months. Relapse was observed in 3 (13%). The relapse time of 3 patients were 4, 6, 12 months after end of omalizumab therapy.

Conclusion: Omalizumab is considered as an effective and safe treatment for CSU in children. Relapses mostly occur within the first year after the cessation of the treatment. Larger-scale studies in this population are warranted.

LBTP1839 | Mucosa-associated epithelial chemokine, thymus expressed chemokine, periostin and zonulin levels in infants with atopic dermatitis

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Background: Atopic dermatitis (AD) is a chronic inflammatory skin disease. Chronic inflammation exacerbates skin barrier impairment, and leads to the development and symptoms of AD. Chemokines and inflammatory markers are involved in pathogenesis of allergic diseases. Our aim was to investigate mucosa-associated epithelial chemokine (MEC/CCL28), thymus expressed chemokine (TECK/CCL25), periostin and zonulin levels in infants with AD.

Method: We examined 74 infants with AD and 63 healthy infants. Severity of AD was evaluated with the SCORing Atopic Dermatitis (SCORAD) index. Serum MEC/CCL28, TECK/CCL25. periostin and zonulin levels were measured.

Results: Infants with atopic dermatitis [9.9 (4.6-16.4) ng/mL] had higher median value of MEC/CCL28 than healthy infants [9.3 (4-16.4) ng/mL] ($P < 0.01$). Median value of zonulin were lower in infants with atopic dermatitis [51.5 (14.3-71.8) ng/mL] compared to healthy controls [58.3 (13.9-80.8) ng/mL] ($P < 0.001$). Duration of atopic dermatitis and SCORAD index score did not show correlation with MEC/CCL28, TECK/CCL25, periostin and zonulin levels. Infants with MEC/CCL28 levels »8.35 ng/mL, have 3.8 times more risk of developing atopic dermatitis than the infants with MEC/CCL28 levels <8.35 ng/mL. In addition, infants with zonulin levels ≤55.15 ng/mL have 5.84 times more risk of developing atopic dermatitis than the infants with zonulin levels >55.15 ng/mL.

Conclusion: Periostin and TECK/CCL25 do not seem to have roles in atopic dermatitis. However, MEC/CCL28 and zonulin are candidates to be investigated in infants with AD and might be used for determining risk for AD.

LBTP1840 | Vascular endothelial growth factor and interleukin-33 levels in children with recurrent wheeze

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Background: Recurrent wheezing (RW) is frequent in preschool children. Wheezing phenotypes, asthma predictive index (API) and modified API (mAPI) have been described for clinical purposes. Our aim was to examine Vascular Endothelial Growth Factor (VEGF) and interleukin (IL)-33 which are involved in inflammation, angiogenesis and remodelling, in children with RW.

Method: Ninety-four children who were under 4 years of age with the history of at least four episodes of wheezing during the last 12 months and age-matched healthy controls were included in the study. Children with RW were classified according to wheezing phenotypes as episodic viral wheeze (EVW) or multi-trigger wheeze (MTW), and positive or negative mAPI. Blood for VEGF and IL-33 levels were drawn during wheezing episode free periods.

Results: Mean ages of children with RW and healthy children were 2.6 ± 0.9 and 2.4 ± 1.02 years, respectively. Children with RW had similar levels of serum VEGF and IL-33 levels with healthy children. When we compared children according to wheezing phenotypes and mAPI, VEGF and IL-33 did not show difference between groups. VEGF levels of girls with MTW (51.5 ± 25.1 pg/mL) were higher than girls with EVW (22.9 ± 18.3 pg/mL) and control group

(32.7 ± 32.2 pg/mL) ($P < 0.01$). 38 children with RW were using inhaled steroid and/or montelukast treatment.

Conclusion: VEGF and IL-33 levels did not show difference between healthy children and children with RW in wheezing episode free periods. These results show that VEGF and IL-33 levels seem not to help in predicting asthma risk. However, serum VEGF levels in girls with RW may help to predict asthma.

SUNDAY, 2 JUNE 2019
LB TPS 03
FOOD ALLERGY

LBTP1841 | Visual communication of allergens on food labels: A qualitative assessment

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Background: An effective food labelling system is very important for health protection of allergic consumers. The last update on the European Food Information Regulations 2014 mandates the disclosure of any of the 14 listed allergens on food labels and establishes guidelines for their presentation. Yet, many consumers still face difficulties when shopping, particularly in the visibility and interpretation of allergen information. Therefore, we aimed to evaluate food allergens visibility and legibility properties considering the Regulation (EU) No 1169/2011 on the provision of food information to consumers.

Method: Twelve visual parameters concerning visibility and legibility were developed. These were validated in a pilot by eight graphic design specialists and PhD design students that employed a 5-point Likert scale in the analysis of food labels (n = 8). Eleven of those parameters were considered to have enough internal consistency ($\alpha > 0.7$) and were used in the analysis of an intentional sampling of food labels (n = 196) in a major supermarket store in Portugal.

Results: All the analysed food labels disclosed the presence of allergens via typographic signal (mostly bold, capital letters or underline) within the ingredients list. The majority of the labels (n = 193) identified the allergen in text by at least one instance of their common name. The mean x-height value of the text of the sample (M = 1.2; SD = 0.2) sits right over the minimum value defined by EU standards of 1.2 mm, and 34 food labels (17%) were found to have that value below the legal limit. The defined typographic parameters found to have the lowest scores were the leading (M = 3.34; SD = 1.13), width-to-height ratio (M = 3.47; SD = 1.17) and tracking (M = 3.71; SD = 1.08), while conspicuity (M = 3.58; SD = 1.16) was the visibility parameter in greater need of improvement.

Conclusion: Our findings support the need to review regulation concerning the principles of visual communication of allergens. Solutions to be developed should respond to functional requirements such as legibility, but also facilitate perception, understanding and decision making, thus providing clear and accurate food allergen labelling for consumers.

LBTP1842 | Identification of hypoallergenic peach and nectarine cultivars by quantification of Pru p 3 content in 102 core peach collections

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Background: The lipid transfer protein Pru p 3 is the most important fruit allergen. Pru p 3 content is variable in different cultivars which affects the severity of allergic reaction. Peach is originated in China with rich genetic diversity. Selection of hypoallergenic variety is beneficial for peach allergic patients.

Method: Pru p 3 content was quantified in peach fruits from 102 core peach collection by double monoclonal antibodies ELISA in 2016-2018. Pru p 3 immunofluorescence was localized in four selected varieties.

Results: As whole fruit, there was up to 18-fold difference in Pru p 3 content among the 102 core peach accessions. Most nectarine cultivars had low Pru p 3 content ranged from 4.8 μg/g-FW to 31 μg/g-FW (fresh weight), while a large variation was observed in peach (with hairy skin): the lowest 3.5 μg/g-FW in a wild peach used as rootstock, to the highest 64.4 μg/g-FW in ripening delicious yellow flesh peaches. Pru p 3 allergen levels were related to flesh color: lowest in the red flesh cultivars, medium for white flesh and highest in yellow flesh varieties. Lower Pru p 3 content varieties usually ripen early, in both nectarine and peach cultivar group, with lower soluble solid content and aroma intensity. Immunofluorescence experiment demonstrated Pru p 3 was localized predominantly in the peel, with a major difference in both peel and pulp between the low and high allergenic cultivars.

Conclusion: Pru p 3 contents are 18-fold variable depending on cultivars, related to fruit type, flesh color and ripening date. We identify several hypoallergenic peach and nectarine cultivars.

LBTP1843 | Sensitization to Ana o 3 in tree nut and peanut allergy

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Background: Ana o 3, a 2S albumin, is known as a major cashew allergen and seems to be an important predictive of both cashew and pistachio allergy. Tree nuts (TN) are a common cause of anaphylaxis and their widely distribution in snacks and processed food raises important concerns. The aim of this study was to evaluate the relevance of Ana o 3 in TN allergy in our Food Allergy Department.

Method: A retrospective analysis was performed assessing clinical and demographic data of TN and peanut allergic patients, and those with positive specific IgE to Ana o 3 (ImmunoCAP-Thermofisher®) were selected.

Results: From 51 patients with TN allergy, 7 sensitized to Ana o 3 were included, 6 male, with a median age of 7 years [4-51]. Six were atopic, with other allergic co-morbidities found in 5. The median age of the first reaction was 4 years [2-35] and the median age at diagnosis 6 years [2-50]. The suspected TN involved were cashew (n = 2), walnut (n = 1), Brazil nut (n = 1), cashew and pistachio (n = 1), cashew and peanut (n = 1) and hazelnut, almond and peanut (n = 1). Clinical manifestations were anaphylaxis (n = 5) and urticaria/angioedema (n = 2). One patient reported anaphylaxis with contact/inhalation and the remaining reactions resulted upon ingestion. All patients had positive skin prick tests (SPT) to cashew and pistachio (exclusive in 3 patients), with the remaining also positive to walnut (n = 3), soy (n = 2), hazelnut (n = 1) and peanut (n = 1). All were sensitized to Ana o 3 [0.39-19.3 kUA/L]; 1 also to Jug r 1 (3.6 ISU-E) and Jug r 2 (0.4 ISU-E); 1 to Jug r 1 (1.7 ISU-E) and Ara h 1 (0.4 ISU-E) and 1 to Pru p 3 (0.51 kUA/L). All patients avoid pistachio and cashew, but 5 patients referred tolerance to other TN; almond (n = 4), hazelnut (n = 3), walnut (n = 3), peanut (n = 2) and pine nuts (n = 1). Only one patient reported accidental exposure, with facial local erythema after a kiss from his father who had eaten pistachios.

Conclusion: In our population prevalence of Ana o 3 sensitization was 14%, it occurred in early life, and was associated with anaphylaxis (71%) and reactions occurring after contact/inhalation. The best predictor of Ana o 3 allergy was positive SPT to cashew and pistachio. As described in the literature, Ana o 3 was associated to cashew and pistachio allergy and the little cross-reactivity observed should alert us to the importance of seeking tolerance to other TN, avoiding unnecessary diets restrictions and improving quality of life.

LBTP1845 | Crustacean characterization: Identifying the seafood allergic patient, co-morbidities and associated atopic risk factors

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Background: Shellfish allergy represents a common acquired food allergy in later childhood and adulthood. Questions often arise on risk of cross reactivity to other food allergens (i.e. finned fish) and risk of shellfish allergy development in patients presenting with other forms of atopic disease. Characterization of the shellfish allergic population would assist in identifying patterns of co-morbid food allergy and atopic disease.

Method: A retrospective chart review in a community allergy clinic serving a population of 2 million in southwestern Ontario was performed to review patient presentation of shellfish allergy. Data on other confirmed food allergies, inhalant allergies and atopic co-morbidities were captured to help identify trends in shellfish allergic population.

Results: Twenty-five patients were confirmed as shellfish allergic from Dec 2015 to Feb 2019. Clinical presentation ranged from oral pruritus to anaphylaxis. Mean age of diagnosis was 42 years and males accounted for majority (19/25, 76%). House dust mite sensitization was the commonest aeroallergen (20/25, 80%) followed by animal dander (16/25, 64%). Atopic dermatitis was found in half (12/25), Asthma in 8/25 (32%) and Allergic Rhinitis in 5/25 (20%). Finned fish allergy as a co-morbidity was identified in 28% of shellfish allergic patients (7/25). Of these seven combined shellfish and finned fish allergic patients, 6/7 (86%) had co-morbid food allergens (tree nuts) and 5/7 (71%) had Atopic Dermatitis. The shellfish-only allergic population was identified with lower co-morbid food allergy (8/18, 44%) and co-morbid Atopic Dermatitis (7/18, 39%). There was no difference in rate of asthma in the shellfish-only allergic group and the combined seafood allergic group.

Conclusion: In the shellfish allergic population, co-morbid finned fish allergy is present in the minority of patients. The combined shellfish and finned fish allergic patient is often more atopic with co-morbid food allergies and atopic dermatitis. Identifying these higher risk shellfish allergic patients for screening of finned fish allergy may be warranted.

LBTP1847 | Study of the effects of Pru p 3 sensitization in the MALT

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Background: Within the study of alimentary allergy, previous reports have shown different aspects of the micro and macromolecular

changes that happen in the mucosa associated lymphoid tissue (MALT). Even with the wide knowledge regarding the sensitization process, there are still several events that remain unclear, making it impossible to achieve definitive treatments against the disease yet. For that reason, we propose to deepen in these studies by analyzing the effects of Pru p 3 (major allergen of peach) sensitization in different MALT systems.

Method: Both in vitro and in vivo approaches were developed for our studies, employing Pru p 3 and its lipid ligand as a model for food allergy sensitization. For the first case, a wide variety of cell lines from different tissue origin were used and multiple parameters, including allergen transportation and cytokines production and release, were studied. For the in vivo analysis, mice were sensitized using different routes and several cellular and histological events were studied.

Results: Pru p 3 administration in epithelial cell lines from skin, gut and lung showed differential transportation of the allergen, together with a differential pattern in the cytokines expression. Similarly, the in vivo studies showed differential tissue remodeling and lymphocyte infiltration, depending on which route was used for Pru p 3 sensitization (nasal, gastrointestinal or epicutaneous).

Conclusion: Allergy is a systemic disease in which very different factors take part, from external barriers to cellular signaling all over the body. These results provide new insights in our understanding of the MALT. Although previous studies already reported changes occurring in this tissue in in vivo models of peach allergy, this is the first report comparing different routes and analyzing them simultaneously, allowing us to understand sensitization effects happening both near the sensitization pathway and through other tissues and systems away from it.

LBTP1849 | Identification and characterization of almond allergens

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Background: Almond, a drupe of *Prunus dulcis* tree from the Rosaceae family is one of the most commonly produced and consumed nuts all over the world. According to studies on the prevalence of tree nut allergies, almond allergy usually ranks fourth. An accurate diagnosis in patients with suspected almond allergy is important because almond is a source of nutrition and milk products for children with other food allergies. Current diagnostic often made on the basis of routine skin prick testing and/or almond specific-IgE levels testing with whole almond protein extract is complicated by a low specificity and thus high rate of false positives. Our aim was to isolate individual known and unknown IgE-binding proteins from almond nuts and evaluate their clinical importance and involvement in cross-reactivity with other tree nuts.

Method: For the isolation of seed storage proteins, a combination of precipitation and chromatographic techniques was used. MALDI-TOF and high accurate tandem mass spectrometry were applied in order to identify the mass and the amino acid sequences of the purified proteins. Further, the immunological activity was evaluated by IgE-ELISA using sera from 31 almond allergic patients.

Results: Preliminary results showed that we purified three IgE binding almond proteins: putative almond vicilin, legumin (Pru du 6) and a 13 kDa antimicrobial peptide. When tested in ELISA, 68% of almond allergic patients' sera had sIgE to almond extract. Of those, 76% contained IgE specific for Pru du 6. Initial testing showed that almond vicilin and 13 kDa antimicrobial peptide were recognized by majority of sera containing almond-specific IgE.

Conclusion: Identification of other IgE-binding almond proteins as well as further biochemical and immunological characterization of the purified proteins will be performed to evaluate the relevance of these proteins for diagnosis of almond allergy based on the concept of component-resolved diagnosis. We will include in the study an equal number of patients who are only sensitized but without symptoms to almond to try to distinguish between allergens specific for clinical reactivity and those involved in cross-reactivity with allergens from peanut or other tree nuts.

LBTP1850 | Sensitization to cow milk components in children with different phenotypes and endotypes of food allergy

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Background: The variety of causes of the food allergy development, complex pathogenesis, and the unequal response of patients to therapy have led to the identification of phenotypes and endotypes of allergic diseases. Studies on the study of food allergy phenotypes and endotypes are rare.

Method: 216 children with cow's milk allergy (CMA) were examined to study the frequency of sIgE to cow's milk protein and its fractions. sIgE was determined by the Immunocap method. IgE-mediated CMA was confirmed in 68.5% of children (n = 148), non-IgE-mediated—in 31.5% of children (n = 68). It was revealed that in most children (n = 87, 58.8%) sensitization was determined to nBos d 8, in 45.9% of cases to nBos d 4 (n = 68).

Results: The conducted clinical and laboratory analysis allowed us to isolate the skin, gastrointestinal, and mixed phenotype CMA in children. The skin phenotype (SPh, n = 72, 33.3%) was characterized by an isolated lesion of the skin. Ig E positive endotype prevailed and was determined in 54 children (75% among children with SPh), the

average level of total Ig E was 27.16 + 3.68 kUA/L. No sIgE for cow's milk protein and its fractions (Ig E negative endotype) were detected in 28 children with SPh. The gastrointestinal phenotype (GIPh, n = 46, 21.3%) was characterized by an isolated lesion of the gastrointestinal tract. This phenotype was represented predominantly by Ig E negative endotype (71.7% among children with GIPh). Ig E positive endotype was determined in 13 children with GIPh (28.26%), the average level of total Ig E was 34.71 + 5.92 kUA/L. Mixed phenotype (MPh) prevailed in our study, n = 98 (45.4%) and was characterized by a combination of skin and gastrointestinal manifestations, 7 children have symptoms of skin, gastrointestinal tract lesions and respiratory manifestations. Ig E positive endotype prevailed, it was determined in 81 children with MPh (82.7%), the average level of total Ig E was 21.58 + 5.24 kUA/L. The analysis showed that sensitization to nBos d 4 has the greatest value on the formation of the GIPh. In the formation of skin manifestations in children with SPh and MPh, the combined sensitization to nBos d 8 and nBos d 6, as well as the combination nBos d 8 and nBos d 5.

Conclusion: Selection of individual phenotypes of CMA will allow explaining the clinical, pathophysiological, functional features of each specific patient and choosing personalized therapy.

LBTP1851 | Cross-reactivity in wheat-dependent, exercise-induced allergy

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Background: Omega-5-gliadin (O5G), a wheat protein, is the major allergen in wheat-dependent, exercise-induced allergy (WDEIA) with high sensitivity and specificity. Anti-O5G IgE cross-reacts with proteins present in rye and barley (secalins and hordeins, respectively), due to structural homology. Therefore gluten-free diets are currently recommended for WDEIA patients. This study looked at the degree of cross-sensitisation between the grains and whether in vitro tests could inform advice on avoidance of rye and barley.

Method: The study included 34 patients, 24 with WDEIA (of WDEIA patients, 83.3% were male, age at diagnosis ranged from 21-72). Specific IgE (sIgE) to O5G, gluten, wheat, rye and barley was measured. The prevalence of patients simultaneously sensitised to wheat, gluten, rye and barley was used to determine the extent of the cross-reactivity.

Results: Of the patients with WDEIA (sIgE to O5G = 9.57 ± 2.28), 75% were sensitised to rye (r = 0.68, significant) with sIgE of 2.00 kua/L ± 0.59, whereas 29% were sensitised to barley (r = 0.33, non-significant) with sIgE of 0.73 kua/L ± 0.39. This indicates that there is significantly less cross-reactivity between barley and O5G than rye and O5G. Of the patients sensitised to wheat, 88% were sensitised to rye and 41% to barley (r = 0.70 and 0.50 respectively, both significant). 17/24 WDEIA patients tested positive for sIgE against wheat. 15/18 of the WDEIA patients tested had anti-gluten sIgE. We found a positive correlation between specific sIgE to wheat and barley but not O5G and barley, suggesting cross-reactivity between barley proteins and wheat proteins other than O5G.

Conclusion: Currently available tests confirm WDEIA patients sensitised to O5G can also be sensitised to proteins in rye and barley. Not all of these patients tested positive for sIgE against wheat or gluten. This suggests that the sensitivity of these tests is lower and may be less specific. This may also be true for tests for barley and rye. If specific IgE against secalins and hordeins could be measured the results might demonstrate a higher level of cross reactivity. Therefore, at present, WDEIA patients cannot be accurately told whether they are safe to eat rye and barley-containing products, even if specific IgE to those grains is negative.

LBTP1852 | Profile of children with persistent peanut allergy

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Background: Peanut allergy is increasing in prevalence, often severe and typically life-long. Treatment requires food avoidance and access to injectable epinephrine. The aim of our study was to describe epidemiological and clinical features of children with persistent peanut allergy.

Method: We conducted a retrospective descriptive study of children with persistent peanut allergy, collected in 1 year (2018) at Infanta Leonor University Hospital (Madrid, Spain). Epidemiological and clinical data were registered from clinical records: gender and age; type of reaction and age at initial reaction; other legumes and nuts tolerance; presence of rhinitis, asthma or atopic dermatitis; and familiar history of atopy. Diagnostic studies performed included skin prick tests and specific IgE (sIgE) to peanut. Persistent peanut allergy was identified in patients with any symptom after peanut ingestion, skin prick test >8 mm and high levels of sIgE to peanut.

Results: A total of 28 children were enrolled in the study (17 males, 11 females). Age range: 3-15 year old (Mean 8.9 year old, median 9 year old). The mean age at the time of the first reaction was 4 year old. All patients were diagnosed by skin prick tests, with a wheal mean size of 13.44 mm (range 8-21 mm) and positive sIgE to peanut, with a mean value of 76 kU/L (14 to >300 kU/L). From the total, 46% were sensitized only to peanut and 56% also to other nuts: hazelnut 21%, cashew 15% and nut 13%. Most patients (89%) tolerated other legumes. Regarding clinical symptoms, the skin (either urticaria or angioedema) was the organ most frequently involved (46%). Anaphylaxis was present in 29% of children, OAS in 7% and gastrointestinal symptoms in 4%. Concerning

concomitants diseases in 61% of patients other allergic pathologies were present, being the most frequent atopic dermatitis, followed by rhinoconjunctivitis and asthma. In addition 64% of cases referred family history of atopy.

Conclusion: Peanut allergy is responsible of severe reactions, with 29% of anaphylaxis in our study. In our population, as described, the profile of persistent allergy to peanut in children is a male, with urticaria-angioedema as clinical manifestation, that tolerates other legumes, and with personal and family history of atopy.

LBTP1853 | Transplantation acquired egg and almond allergy in patient under tacrolimus immunosuppression

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Case report:

Background: Transplantation Acquired Food Allergy (TAFA) is a common phenomenon described after orthotopic solid organ transplantation, especially after liver or kidney transplantation. This occurrence is mostly reported in childhood and the etiology of TAFA is still unclear. However, it is known that immunosuppression with calcineurin inhibitors (CNIs), especially tacrolimus, compared to other CNIs, may play an important role in TAFA by inducing a shift towards T-helper 2 cells.

Case report: A 53-year-old patient underwent intestinal transplantation due to a desmoid tumor associated with Familial adenomatous polyposis (FAP). Immunosuppressive treatment with tacrolimus was given. Five years after transplantation, the patient presented with dysphagia, nausea, abdominal pain, vomiting, facial erythema and diarrhea related to the immediate intake of raw or poorly cooked egg. Six years later, the patient presented the same symptoms after almond intake. Both foods were previously throughout his life.

Methods and results: Skin prick-test with egg commercial extracts, prick by prick with almond, general IgE and specific IgE Immunoassay were performed. Skin prick testing was positive for commercial extracts of egg white (EW) (7 mm), egg yolk (EY) (6 mm), ovoalbumin (OVA) (7 mm), ovomucoid (OVM) (14 mm). Prick by prick was positive for almond (11 mm). The presence of Egg-specific IgE antibodies with positive results for EW 3.14 kUA/L, EY 0.91 kUA/L, OVA 1.67 kUA/L OVM 1.08 kUA/L and almond 0.56 kUA/L confirmed the sensitization with no evidence of sensitization to other nuts, profilin or LTP.

Conclusion and clinical relevance: As displayed in this report, we present a rare case of de novo egg and almond allergy, appearing in adulthood after intestinal transplantation. Given the limited experience in intestinal transplantation, increasing awareness of allergen sensitization following transplantation may help to prevent serious allergic reactions in transplant recipients. This case emphasizes the importance of the avoidance diet, thanks to which, it was not necessary to change the immunosuppressive treatment.

Keywords: anaphylaxis; egg allergy; almond allergy; transplant-acquired food allergy (TAFA); intestinal transplantation.

LBTP1854 | First report of monosensitivity to the Atlantic wolffish (*Anarhichas lupus*)

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Case report: The Atlantic wolffish (*Anarchichas lupus*) is a fish type belonging to the classification of the *Perciformes*, which also comprises tuna and mackerel. The wolffish thrives in moderately deep and cold water and can be found mostly in the North Atlantic Ocean. Here, we report a case series of two patients with a unique allergy only against wolffish, whereas they tolerate many other types of fish. Patient 1, a 44-year old female, developed throat swelling after consumption of wolffish. Specific IgE (sIgE) tests (*ImmunoCAP*, *Phadia Thermofisher*) were negative for all fish, including mackerel and parvalbumin. Skin prick tests (SPT) were positive for wolffish, shrimp and house dust mite, and negative for oyster, salmon, codfish, tuna, flatfish and sole. SPT for mackerel, which belongs to the *Perciformes* as well, was dubious. The patient tolerated all these fishes, including crustacean and mollusca. Patient 2, a 70-year old man, developed diffuse urticarial rash and hypotension with an acute serum tryptase increase to 23.6 μg/L 2 hours after ingestion of wolffish. Two years before, he already had an allergic reaction after eating wolffish and crustacean, however, at that time, the crustaceans were thought to be the culprit as he had tolerated all species of fish in between. SPT were positive for wolffish, scampi and oyster, and negative for salmon, codfish, trout and shrimp. SPT were dubious for tuna, mackerel, tilapia and sole. sIgE was positive for mackerel (1.18 kU/L) and negative for all other tested fish, including parvalbumin. Additional basophil activation tests (BAT) in both patients showed reactivity towards defatted wolffish and untreated wolffish, but not to codfish and swordfish. An immunoblot using wolffish, codfish, swordfish and shrimp extracts and the serum of both patients showed a strong binding to multiple protein bands with a molecular weight between 37 and 50 kDa. Protein bands with higher molecular weight showed reactivity as well, although less intense. On top of that, one of the patients reacted very strong to a protein band around 30 kDa. No protein bands were

identified to codfish and swordfish. An oral provocation test with codfish and salmon in patient 2, was negative.

To our knowledge, we hereby report the first case series of unique sensitization to Atlantic wolffish or *Anarhichas lupus*, demonstrated by SPT, BAT and immunoblotting.

LBTP1855 | Component-resolved study in microarray format of cow milk and chicken egg white major allergen proteins in allergic patients in Moscow region, Russia

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Background: The cow milk and chicken eggs are well-known allergen sources and ones of the main food products in Russia. However there is still shortfalls of information about IgE reactivity to individual allergens from these sources in this region. Here we aimed to determine the profile of IgE reactivity to three major chicken egg white allergens (Gal_d1, Gal_d2, Gal_d3) and five major cow's milk allergens (Bos_d4, Bos_d5, Bos_d6, Bos_d8, lactoferrin) in allergic patients in Moscow region, Russia.

Method: The study was conducted using sera from 60 anonymous subjects: 30 and 10 patients with ≥0.35 IU/mL serum levels of IgE to cow milk extract (f2, ImmunoCAP) and to chicken egg white extract (f1, ImmunoCAP) respectively and 20 negative controls. Allergens were purified from chicken egg white, cow milk and blood serum using modified published methods. IgE levels were measured using specially developed microarray method.

Results: Gal_d1 was found to bind IgE from 6/10, Gal_d 2 from 9/10 and Gal_d 3 from 9/10 of the patients sera tested. Bos_d4, Bos_d5, Bos_d6, Bos_d8 and lactoferrin were found to bind IgE from 21/30, 22/30, 20/30, 12/30 and l 3/30 of the patients sera tested respectively. We found a moderate positive correlation between total IgE and specific IgE to all chicken egg white allergens and to Bos_d4, Bos_d5, Bos_d6 and Bos_d8. Only two samples classified by ImmunoCAP as negative showed positive signal to cow milk protein, one of which was positive in ImmunoCAP f 27 (beef) test. About 95% of the patients could be diagnosed as egg white or milk allergic using the combination of these 8 allergens.

Conclusion: Sensitization to chicken egg white and cow milk individual allergens in Russia is comparable to previous studies in other regions. Eight investigated proteins together (Gal_d1, Gal_d2 and Gal_d3; Bos_d4, Bos_d5, Bos_d6, Bos_d8 and lactoferrin) are suitable for use as a sensitization markers equally as well as extracts in in vitro molecular (serological) diagnostics. Developed method of protein extraction from native sources will allow to investigate the diversity of protein composition of different commercially available food products that could be useful in correction of diet plans of allergic persons.

LBTP1856 | Food allergy profiles observed within ethnic group populations in West Birmingham and Sandwell, UK

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Background: Studies in America have shown that there are differences in food allergy profiles seen in African American, Latino and white populations but there is a paucity of data for the UK. The population within the West Birmingham and Sandwell area in the UK is ethnically diverse so data were collected to ascertain any differences between the ethnic groups regarding allergenic foods.

Method: Data on the ethnicity of paediatric allergy patients and their food allergies seen by a paediatric allergy dietitian at Sandwell General and City Hospitals were collected for 6 months in 2018.

Results: Data were collected on 221 patients and 13 ethnicities. Only milk was divided into IgE mediated and non IgE mediated (See table). Nuts, milk and egg were the top three allergens in all ethnic groups. The most common nut allergy across all the groups was peanut, except for Black Afro-Caribbean where it was cashew. Egg was the commonest allergen in Black African and white European children. The most common food allergy for white British children was non IgE mediated cow's milk allergy whereas for Bangladeshi children it was jointly fish and peanut, for Black Afro Caribbean it was cashew and for Indian, Pakistani and Black Afro Caribbean it was egg.

Milk allergy (IgE and non IgE) was common in all ethnicities, except white British, there was more IgE mediated than non-IgE mediated milk allergy.

Conclusion: There were differences in the most common food allergens between ethnic groups. This may be a reflection of the types of foods eaten within these communities but may also reflect weaning and genetic differences. This would need to be explored further. A nut or milk allergy featured in the top 3 food allergies in the majority of the ethnic groups. Egg featured in the top 3 food allergies for all groups. The ethnically diverse population means it would be potentially be useful to develop more culturally appropriate dietetic resources, and in relevant languages.

	White (N = 80)	Indian (N = 36)	Pakistani (N = 33)	Bangladeshi (N = 15)	Black Afro-Caribbean (N = 14)	Black African (N = 14)	White European (N = 9)	Other (N = 20)
NUTS	32%	69%	58%	67%	36%	58%	12%	55%
Peanut	19%	42%	33%	33%	21%	50%	11%	90%
Cashew	5%	42%	30%	13%	30%	33%	11%	54%
Pistachio	5%	36%	18%	13%	14%	33%	11%	18%
Almond	1%	25%	3%	13%	7%	30%	0%	9%
Brazil	1%	3%	3%	7%	7%	33%	0%	9%
Walnut	3%	25%	6%	27%	7%	30%	0%	9%
Hazelnut	4%	22%	15%	20%	14%	33%	11%	18%
Egg	30%	53%	51%	27%	21%	67%	44%	80%
Milk **Of which**	63%	33%	30%	47%	43%	50%	33%	50%
IgE	25%	30%	18%	27%	29%	50%	22%	40%
Non IgE	38%	3%	12%	20%	14%	0%	11%	10%
Wheat	4%	14%	9%	0%	0%	21%	0%	5%
Fish	4%	0%	9%	33%	21%	21%	0%	0%
Sesame	3%	6%	3%	0%	7%	7%	0%	5%
Soya	3%	14%	3%	0%	7%	0%	0%	0%
Lentil	1%	11%	9%	13%	0%	0%	0%	0%

The information from this survey would suggest that producing supportive literature about egg, milk and nut avoidance in a variety of languages would be beneficial. It would also suggest that leaflets on baked milk and egg introduction should contain more culturally appropriate foods. Further studies on weaning practices in these diverse populations would need to be explored further.

LBTP1857 | PIPE cloning: Fast production of human monoclonal IgG1, IgG4 and IgE antibodies specific for the major milk allergen beta-lactoglobulin

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Background: Polymerase Incomplete Primer Extension (PIPE) cloning (Ilieva et al., 2017) is the newest technique to produce allergen-specific monoclonal antibodies. Antibodies against beta-lactoglobulin could be useful tools in order to study the mechanisms of cow's milk allergy and for the tracing of beta-lactoglobulin (BLG) in milk samples. Some infants suffer from cow milk allergy during their first years of life, but the allergy can be "outgrown" after some years. The role of IgE vs IgG1 and IgG4 antibodies during the development of cow's milk allergy, or during re-establishment of tolerance against cow milk on the other hand needs to be explored. We aimed to generate IgE, IgG1 and IgG4 antibodies against the major milk allergen beta-lactoglobulin (BLG) by Polymerase Incomplete Primer Extension (PIPE) cloning.

Method: The antibodies, containing the variable region against BLG (Jylhä et al. 2016), were assembled using the PIPE cloning method, transformed into E. coli and finally transfected into Expi293F cells for expression. After purification with affinity chromatography, correct assembly of the antibodies was determined by SDS-PAGE, their specificity to BLG was investigated by dot blot, ELISA and ISAC 112 allergen microarray. The functionality of the blocking capacity of IgG4 was checked by inhibition immunoassays.

Results: One transfection (30 mL) yielded 2.2 mg of IgE, 0.8 mg of IgG1 and 1.9 mg of IgG4 antibodies. Correct assembly of all antibodies was confirmed and their specific binding to BLG was double-checked in dot blot and in an allergen microarray with 112 allergens. In vitro, concentration-dependent specific binding of all antibodies to BLG was observed. Furthermore, IgG4 antibodies achieved a significant inhibition of the binding of IgE to BLG in a concentration-dependent manner in ELISA assays.

Conclusion: PIPE-cloning yielded high amounts of anti-BLG IgE, IgG1 and IgG4 antibodies with high specificity. They are ready to be applied in functional studies of milk allergy. They will also be suitable to detect trace amounts of BLG in milk products to enhance patients' food safety.

LBTP1858 | Changes in skin prick-tests and serum specific IgE in patients under Cow's Milk Oral Immunotherapy (OIT): A 48 months follow-up evaluation

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Background: Cow's milk (CM) allergy is one of the most frequent food allergies in children and the probability of acquiring natural tolerance is low after the age of 5. OIT to CM is an effective treatment to induce desensitization for these patients. We aimed to assess the long-term effect up to 48 months follow-up (FU) of CM OIT on serum specific IgE (sIgE) and skin prick-test (SPT) in patients who were desensitized to 200 mL of CM.

Method: We carried out a retrospective analysis of 58 patients that began cow's milk OIT protocol (Ethical approval nr. 05/345) between January 2006 and May 2013 and who were desensitized to 200 mL of CM. SPT and sIgE (ImmunoCAP) to CM, Casein, alpha-lactalbumin (ALA) and beta-lactoglobulin (BLG) were measured at baseline, at the end of desensitization (when 200 mL of CM were well tolerated on a daily basis), at 6, 12, 24 and 48 month FU. During the FU period, patients continued to have 200 mL of CM daily and/or free CM diet. IBM SPSS Statistics V. 21.0 and R V.3.2.2 were used for statistical analysis including time dependent linear regression models.

Results: The mean age of patients at baseline was 7.1 years (4-15 years), 57% were boys, their first allergic reaction with CM had been on average at 4.8 months with the main presenting symptoms being urticaria, angioedema, erythema, vomiting and bronchospasm. Baseline SPT mean values in mm were: 8.47 for CM, 7.54 for Casein, 9.40 for ALA and 8.40 for BLG. Baseline sIgE median values in kUA/L were 20.95 for CM, 15.00 for Casein, 5.48 for ALA and 2.33 for BLG. All patients had a persistent CM allergy confirmed by an entry CM oral challenge. The mean duration of the OIT was 96 days (range between 23 and 399 days). All SPT significantly diminished overtime with respect to baseline values: CM ($P < 0.0001$), Casein ($P < 0.0001$), ALA ($P = 0.001$) and BLG ($P = 0.005$). The same pattern was observed in the sIgE for CM ($P = 0.0007$), Casein ($P = 0.0003$), ALA ($P = 0.01$) and BLG ($P = 0.07$).

Conclusion: SPT and sIgE to CM, Casein, ALA and BLG significantly decrease overtime following successful OIT to CM and support the immunomodulatory effect of OIT.

LBTP1859 | Clinical and serological characterization of a large cohort of red meat allergic patients from Sweden

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Background: Red meat allergy is a novel form of food allergy recognized worldwide. The patients experience severe allergic reactions several hours after meat consumption and have IgE antibodies directed against the carbohydrate galactose-α1,3-galactose (α-Gal), which is present in mammalian meat. The onset of the disease is associated with tick bites. Here, we characterize a cohort of red meat allergic patients from Sweden on a clinical and serological level.

Method: A total of 137 patients were enrolled in the study by a physician experienced in allergic disease, after they were diagnosed with red meat allergy. All had answered to a detailed questionnaire regarding symptoms related to meat intake and tick exposure. The patient sera were analysed for IgE reactivity against protein extract from the European tick Ixodes *ricinus* (streptavidin ImmunoCAP) and birch and timothy pollen using the ImmunoCAP System (Thermofisher Scientific, Uppsala, Sweden). The limit of detection was set at 0.1 kU_A/L.

Results: All patients were IgE positive to α-Gal and the median α-Gal IgE level of the cohort was 17.4 kU_A/L (range 0.26-144 kU_A/L). Sensitization to pork and beef was observed in 98% and 98.5% of the patients, respectively. They all suffered from the "classical" α-Gal-syndrome with delayed severe symptoms after mammalian meat consumption. Nearly half (47%) reported anaphylaxis. The majority reported urticaria (91%) and gastrointestinal symptoms (75%) and more than half (60%) experienced angioedema. Neither the anti-α-Gal IgE/total IgE ratio nor the anti-α-Gal levels were associated with symptom severity. The median age of the patients at time of inclusion was 49 years and men and women were in equal numbers. All but three belonged to the B-negative blood groups (A/O). All patients but one reported that they had been tick bitten and 77% were IgE positive to *Ixodes ricinus*. Also, 44% of the patients were clinically diagnosed with airborne allergies, and sensitization to birch and timothy was observed in 72% and 63% of these subjects respectively.

Conclusion: The awareness of the α-Gal syndrome is increasing in Sweden. In this large cohort of patients almost half experienced anaphylactic shock pointing to the severity of the disease. All but one patient had been tick bitten underlining the strong relationship with tick bites. Pollen sensitization and the traditional atopic phenotype with airborne allergy was found to be common among these patients.

MONDAY, 3 JUNE 2019
LB TPS 04
AIR POLLUTION AND ENVIRONMENTAL ALLERGIES

LBTP1860 | In-depth quantitative profiling of post-translational modifications of Timothy grass pollen allergome in relation to environmental pollution and oxidative stress

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Background: An association between pollution (e.g. from traffic emissions) and the increased prevalence of respiratory allergies has been observed. Field-realistic exposure studies provide the most relevant assessment of the effects of the intensity and diversity of urban and industrial contamination on pollen structure and allergenicity. The significance of in-depth post-translational modification (PTM) studies of pollen proteomes, when compared with studies on other aspects of pollution and altered pollen allergenicity, has not yet been determined; hence, little progress has been made within this field.

Method: We undertook a comprehensive comparative analysis of multiple polluted and environmentally preserved *Phleum pratense* (Timothy grass) pollen samples using scanning electron microscopy, in-depth PTM profiling, determination of organic and inorganic pollutants, analysis of the release of sub-pollen particles and phenols/proteins, and analysis of proteome expression using high resolution tandem mass spectrometry. In addition, we used quantitative enzyme-linked immunosorbent assays (ELISA) and immunoglobulin E (IgE) immunoblotting.

Results: An increased phenolic content and release of sub-pollen particles was found in pollen samples from the polluted area, including a significantly higher content of mercury, cadmium, and manganese, with irregular long spines on pollen grain surface structures. Antioxidative defense-related enzymes were significantly upregulated and seven oxidative PTMs were significantly increased (methionine, histidine, lysine, and proline oxidation; tyrosine glycosylation, lysine 4-hydroxy-2-nonenal adduct, and lysine carbamylation) in pollen exposed to the chemical plant and road traffic pollution sources. Oxidative modifications affected several Timothy pollen allergens; Phl p 6, in particular, exhibited several different oxidative modifications. The expression of Phl p 6, 12, and 13 allergens were downregulated in polluted pollen, and IgE binding to pollen extract was substantially lower in the 18 patients studied, as measured by quantitative ELISA.

Conclusion: Quantitative, unrestricted, and detailed PTM searches using an enrichment-free approach pointed to modifications of Timothy pollen allergens and suggested that heavy metals are primarily responsible for oxidative stress effects observed as oxidative post-translational modifications of pollen proteins.

LBTP1861 | Association between sensitization to grasses and molds as cause of exacerbation asthma in autumn

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Background: Mold airborne and grass pollen are important aeroallergen sources with different seasonal behaviour: whereas pollen levels have a marked seasonality (high levels in late spring and early summer), fungal spores are an ever component of the environment, reaching highest levels in late spring and early autumn. In Central Spain, clinical evidences about patients with grass pollen allergy who suffer from asthma attacks in September-October have been reported, when pollen is not longer present but grass straw is.

Method: In the current study, several assays have been performed in order to prove a possible co-sensitization phenomenon between grasses and associated-fungi. After identifying fungal species present in grass straw harvested in autumn, IgE immunodetection assays were performed to detect sensitization to both grass straw proteins and associated-mold proteins in a group of grass pollen sensitized-patients.

Results: After having identified five fungal isolates from grasses which have long been associated with allergy, immunodetection assay revealed that a high percentage of grass pollen sensitized-patients have sIgE against fungal proteins, having these patients IgE against grass straw proteins too. Moreover, results suggest that allergens present in pollen could be conserved in grass straw.

Conclusion: With the present study, we observed that grasses harvested in September-October could be infected with mold spores from species that play an important role in respiratory allergy. Patients with grass pollen sensitization showed a positive recognition to mold and grass straw proteins. But also, allergic grass pollen proteins interact with fungal spores, acting spores like vehicle of transmission of straw allergens. In summary, co-sensitization

process between both aeroallergen sources could be happening, being the base of asthma attacks observed in autumn.

LBTP1862 | Sensitisation and respiratory symptoms induced by a new allergen from Peach tree pollen in children and adolescents

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Background: Peach tree pollen (PTP) is relevant in sensitisation in children and adolescents in areas of peach cultivars and can induce several clinical entities involving airways. We studied the frequency of sensitisation to peach tree pollen as well as Pru p 9, a new allergen identified by our group.

Method: We carried out a population-based study in Blanca (Murcia region, South-East Spain). We evaluated subjects who referred seasonal respiratory symptoms. Their parents signed a written informed consent and the subjects answered an adapted questionnaire supervised by their caregivers. We did skin prick tests (SPTs) to prevalent pollens, PTP and Pru p 9 as well as Nasal provocation test (NPT) with PTP and Pru p 9 in 11 randomly selected children and adolescents with positive SPT. The response was measured by symptoms score and acoustic rhinometry.

Results: We included 615 subjects aged between 3 and 19 year old. No differences were found in gender. The 34% of them were sensitised to pollens: *O. europaea* 33%, *P. pratense* 26%; *S. kali* 19%, *C. arizonica* 17%, *P. Judaica* 13%, *P. acerifolia* 10% and *A. vulgaris* 9%.

The 20% of them had positive SPT to PTP (median age 12 years old, 61% male, 89% atopic). These subjects referred Rhinitis (67%), Conjunctivitis (57%) and Asthma (18%). In a randomly selected subgroup of subjects sensitised to PT pollen, the 30% were SPT+ to Pru p 9. Nine out of 11 NPT with PTP were positive. In those who had a positive challenge with PTP we performed NPT with Pru p 9, being positive in four subjects.

Conclusion: In exposed children and adolescents, PTP is the third most prevalent in sensitisation after olive and grass pollen and induced symptoms after specific nasal challenge. The new allergen from PTP, Pru p 9, can elicit respiratory symptoms in sensitised children and adolescents. Other allergens in addition to Pru p 9 seem to be also implicated.

LBTP1863 | Prevalence of asthma and obesity and the role of environmental factors

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Background: Air pollution and environmental factors is a well-known risk for lung diseases, including asthma. Growing evidences suggesting Air pollution and environmental factors as a novel risk factor for the development of obesity. Several Epidemiological studies have ascertained an association between various ambient and indoor air pollutants and obesity by medium of endocrine disruptive chemicals that can disrupt the normal development and homeostatic controls over adipogenesis and energy balance and induce obesity. Several obesity-induced mechanisms have been proposed that increases this vulnerability of obese individuals to harmful effects of air pollution rendering them more susceptible to developing Air pollution and environmental factors driven incident asthma or worsening of already existing asthma.

Method: Asthmatic and control subjects were divided into 2 groups: obese and non-obese. The asthma group consisted of 24 women (10 obese and 14 non-obese). Among the 22 women in the control group, 14 were of normal weight, while 8 were obese. Mean age of the obese asthma patients (n = 40) was 35.4 ± 10.5 year, whereas mean age of the nonobese asthma patients (n = 33) was 30.8 ± 6 year. The control group consisted of 14 women of normal weight (mean age: 30 ± 7.5 year) and 8 obese women (mean age: 32 ± 9.5 year).

CD4+, CD8+ T cells, leptin, interleukin-6 (IL-6) and Vitamin D were compared between obese, asthmatics and control subjects of normal weight. Respiratory function tests and allergy skin tests were also performed in the patients with asthma.

Results: Interleukin-6 (IL-6), and leptin levels in obese asthma patients were higher than in the healthy controls ($P < 0.01$). IL-6 and leptin levels were higher in obese asthma patients than in non-obese asthma patients ($P < 0.01$). No association was found between CD4+, CD8+ T cells, Vitamin D,allergy test results and obesity ($P > 0.05$).

Conclusion: It is well documented that increased exposure to indoor allergens and selected outdoor allergens (grass pollen and molds) are important risk factors for development of asthma and allergic sensitization. We identified, inflammation markers were at their highest levels in obese asthma patients. Leptin levels were considerably higher in obese patients than in normal weight controls. Like obesity, leptin is suggested to play a role in the pathogenesis of asthma.

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LBTP1864 | Atmospheric pollutants NO_2 and O_3 enhance allergenic potential of *Dactylis glomerata* pollen

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Background: Airborne pollen during its transport become in contact with a variety of atmospheric chemicals, including the common air pollutants O_3 and NO_2. Nevertheless, the effect of these pollutants, alone or in combination, is not fully elucidated. With a strong oxidizing potential, ozone may affect pollen redox balance and contribute to change the ratio of ROS scavenging enzymes and in the presence of NO_2, may also contribute to the nitration of proteins, including allergens, affecting pollen allergenicity. Traffic-related pollution may as such contribute to an increased prevalence of pollen driven allergic diseases in urban areas.

The goal of this research was to study the effects of O_3, NO_2 and the mixture of both pollutants on IgE-reactivity patterns to *Dactylis glomerata* pollen, as well as on the levels of Dac g 5 and profilin by immunoblot.

Method: *D. glomerata* pollen was treated in an environmental chamber during 6 hours. Protein extracts from unexposed (Control) or exposed to air pollutants (O_3, NO_2 or O_3+NO_2) pollen samples were prepared in phosphate buffered saline (PBS) and frozen until analysis. SDS-page separated proteins were blotted and used to obtain IgE-reactivity patterns with pooled sera (from four *D. glomerata* EAST-positive sera) and with antibodies against grasses group 5 allergens and profilin.

Results: IgE-reactivity have shown bands with MW of 15, 29, 33, 37, 46, 52, 57, 60, 69 and 142 kDa (intensity >4%). Bands with 15, 57 and 60 kDa were intensified by NO_2 exposure compared to control. Pollen exposure to O_3 induced an amplification of IgE-reactivity in 40% of the detected bands (29, 33, 60, 66, 69, 74 and 80 kDa). Pollen exposed to O_3+NO_2 showed augmented IgE-reactivity in bands with 14, 15, 18, 57, 66 and 80 kDa. Some of the bands identified to be affected by the pollen exposure to air pollutants of MW 29, 33 and 60 kDa, have correspondence to known allergens, respectively, Dac g 5, Dac g 1, Dac g 4. Additionally, immunoblot performed with IgG anti-Dac g 5 and anti-profilin confirmed overexpressed bands with, respectively, ~30 kDa and ~13 kDa, in O_3 treated pollen.

Conclusion: *D. glomerata* pollen exposure to O_3 and NO_2 showed enhanced IgE recognition of several proteins, some of which are described allergens. These results suggest that common air pollutants contribute to an increased pollen allergenicity and directly correlating with the higher incidence of respiratory allergic diseases in urban areas.

LBTP1865 | Performance of the personalized allergy symptoms forecasting system

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Background: The current study presents the performance of the symptom forecasting model of Personalized Pollen Allergy Symptoms Forecasting System that has been run over the pollen season of 2018 in Europe in a format of a web-page (www.pasyfo.lt) and free-of-charge mobile application developed in Medical University of Vienna. The software is available in nine languages, including four languages (Lithuanian, Latvian, Russian and English) for Latvia and Lithuania.

Method: The system consists of numerous segments, and several forecasting models developed using statistical methods as well as the reference persistence-forecasting approach. The system provides instrumentation for combining the symptom entries with air quality and pollen concentrations predictions of the Copernicus Atmospheric Monitoring Service downscaled using computations of SILAM model (FMI) for Northern Europe.

Results: Users of the system in case of Latvia and Lithuania in 2018 are mostly (70%) women, with the age range 25-43 years. The current evaluation refers to the statistical model, which projects the environmental parameters to the user entries (i.e. symptoms). The result of the performance varies from user to user. Statistical analysis of the performance shows correlation coefficients fluctuation from very low to high (>0.85). The first preliminary results suggest that over 50% of the patients were predicted with >0.5 correlation coefficient, better scores obtained for nose and eye, worse—for lungs.

Conclusion: The evaluation corroborates with the results of the PASYFO feasibility study and the main hypothesis behind the system: symptoms can be successfully forecasted for a substantial fraction of the allergy sufferers.

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LBTP1866 | Temporal changes in molecular aerobiome diversity by applying DNA metabarcode sequencing across the pollen season

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Background: The importance of grass pollen to the global burden of allergic respiratory disease is well established but difference in

exposure to subtropical and temperate Poaceae pollens is difficult to discern. Current monitoring of airborne pollen relies on light microscopy limiting for most pollen identification of taxa to family level. We aimed to apply DNA metabarcoding to identify specific taxa contributing to the aerobiome of environmental air samples and assess temporal variation of Poaceae pollen across the season.

Method: Airborne pollen concentrations were determined by light microscopy over two pollen seasons in the subtropical city of Brisbane (27°S, 152°E), Australia. Daily pollen samples, collected simultaneously with a standard continuous flow volumetric pollen and spore trap, one every 7 days over 30 weeks, were subjected to high throughput DNA sequencing of the plastid rbcL amplicons. Frequency of amplicon reads for identified taxa, principal component and redundancy analysis of aerobiome community diversity and median-joining network analysis of taxa were performed.

Results: Amplicons from a pilot study of 12 samples collected during summer corresponded to plants observed in the local biogeographical region and airborne pollen observed by microscopy. During the following pollen season, 3238 different operational taxonomic units (OTU) were detected in 30 environmental air samples. The aerobiome sequencing data identified pollen to genus and species levels. Redundancy analysis of the OTUs and sequencing read counts indicated significant quantitative differences in aerobiome diversity between the months and seasons. Multiple peaks of Chloridoideae and Panicoideae grass pollen were evident over the season confirming these subtropical grasses as the dominant Poaceae pollen sources in this subtropical region in spring as well as summer.

Conclusion: DNA metabarcode sequencing of airborne pollen applied to routinely collected environmental air samples offers significant utility to track temporal changes in aerobiome diversity with potential to monitor short- and long-term shifts in pollen exposure. Precise identification of the composition and temporal distributions of airborne pollen is important for tracking biodiversity and for management of allergic respiratory disease.

LBTP1867 | Cathelicidin treatment reduces negative changes in the expression of genes involved in pulmonary fibrosis in mice model of hypersensitivity pneumonitis

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Background: Pulmonary fibrosis is more and more frequent pathology in aging global population. Unfortunately, this disorder is characterized by a bad prognosis: no treatment is known and the survival is dramatically low. Pulmonary fibrosis occurs in a number of respiratory diseases, including hypersensitivity pneumonitis (HP), which is one of the most frequent reasons for this phenomenon. As the main mechanism of pulmonary fibrosis is a pathology of repair of wounded pulmonary epithelium, we assumed that improvement of its regeneration by application the natural enhancer of this process—cathelicidin (CRAMP; antimicrobial peptides, a key component of innate immunity) could prevent or slow down the disease development.

Method: The studies were performed in mice model of HP, wherein pulmonary fibrosis is induced in mice strain C57BL/6J by chronic exposure to saline extract of *Pantoea agglomerans* (SE-PA). Cathelicidin was administering in a form of aerosol during and after HP development. CRAMP was used in dose needed to obtain in mice lung tissue concentration two times higher than the physiological. The influence of CRAMP chronic exposure on lung tissue was also investigated. Changes in the expression of genes involved in epithelial-mesenchymal transition (EMT) were examined in lung tissue homogenates by the Real Time PCR.

Results: Performed studies revealed that cathelicidin decreases the elevated level of myofibroblasts markers (*Vim*, *Acta2*, *Fn1*, *Cdh2*) as well as increase the lowered level of epithelial markers (*Cdh1*, *Ocln*) in mice model of HP. Cathelicidin also reduced the expression of *Snail1*, *Snail2*, *Zeb1*, *Zeb2* (transcription factors responsible for EMT process) up-regulated by SE-PA exposure. Cathelicidin also inhibited the expression of key representatives of signaling pathways leading to mesenchymal differentiation (*Tgfb1*, *Nfkb1*, *Ctnnd1*, *Wnt1*, *Wnt2*, *Wnt3a*, *Wnt5a*, *Notch1*, *Notch3*) accelerated by SE-PA treatment. The beneficial impact of CRAMP on the expression of mentioned genes was observed both during and after HP development. Nevertheless, cathelicidin was not able to completely neutralize the negative changes induced by SE-PA. Furthermore, it has to be noted that mice chronic exposure to cathelicidin did not cause any side-changes in the expression of investigated genes.

Conclusion: Our results suggested the possibility of cathelicidin using in the prevention and treatment of pulmonary fibrosis.

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LBTP1868 | Important of aeropolinologic study in children with risk of respiratory allergies

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Background: Aeropolinologic study and monitoring in modern clinical medicine acquired particular importance, as far as it is known that among the etiologic risk factors of respiratory allergies .

Method: The goal of the study was to determine frequency and character of dysfunction of bronchi in the children (n = 500, 275

boys and 225 girls) of the early school age (7-12 yy.) by the peak flow meter method and computer spirometry.

Results: It was found that 19.6% of the practically healthy children of the early school age had decreased peak expiration rate. Decreased peak expiration rate under the physiological conditions was revealed in 61.2%, dysfunction of external respiration with positive provocation test of the misty distilled water in 27.5%, the obstruction of bronchi with physical tension only in 11.3% of the sample. It was designated correlation between decrease peak flow rate and pulmonary function indices such as: (FVC) $r = 0.4$; (FEV1) $r = 0.6$; (FEV1/VC) $r = 0.2$; (PEF) $r = 0.3$; (MEF 50%) $r = 0.5$; (MEF 25%) $r = 0.4$. Thus the peak flow meter method and spirometry permits to reveal among the children of the early school age the patients with dysfunction of bronchi and to unite them into the risk group of respiratory allergies. The data of aeropolinometer "Burkard Trap" were defined in accordance with the calendar for distribution of aeroallergens reflecting concentrations of blossoming tree-plants and atmospheric aerosols in the air. Permanent monitoring of the aeropolinometer "Burkard Trap" data proved that in west Georgia the beginning of aeroallergens' increasing concentrations is in March and the ending—in October, respectively, the peak is in May, when atmospheric concentrations of approximately 21 plants are increasing in the air simultaneously. Ambrosia, plantain, common hazel, birch tree, alder, ryegrass, flowering period of which is given in the calendar, are widely spread and characterized with high allergenicity. Every above-mentioned diagnostic markers have high degree correlation with each other and correlation coefficient was $r = 0.6$, on average.

Conclusion: Calendar for distribution of aeroallergens in West Georgia, and updated information about the concentration of aeroallergens are constantly given to the children who are from high risk group of respiratory allergy. High degree correlation between the above-mentioned markers proves its clinical importance/value with respect to respiratory allergy. The publication has been prepared with the support of the «RUDN University Program 5-100».

LBTP1869 | Second and third-hand smoke: Public perceptions of the risks for children's health

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Background: Passive smoking is a form of secondary exposure to the components of cigarette smoke by nonsmoking individuals in the same environment as an active smoker. Third-hand smoking is the contamination of tobacco products that persists in the environment after the cigarette has been put off. Both are harmful to health, and it is believed that many diseases and conditions can be developed in children under its influence. This study evaluates the perception of the users of the Family and Community Health Unit (USFC) about the harmful effects of smoke in children's health.

Method: Through a questionnaire, the knowledge of the population about smoking and the health risks of children derived from smoke in its different forms were evaluated: in the same environment, in a different environment or in the external environment of the house where the child lives. It was questioned the relation of these types of smoke with asthma, low growth, obesity, frequent colds, pneumonia, otitis, hearing loss, tonsillitis and snoring.

Results: The results showed that, among the responses, there was a greater relationship between smoking and respiratory diseases, with percentages up to 96.4% in asthma in children in the same environment, up to 45.8% ($P < 0.005$) in outdoor settings. Besides that, the population does not believe that the other diseases, not directly connected to the respiratory system, are related to any type of smoke. As an example, hearing loss had a connection with smoking habits in the same environment for only 38.9% of the interviewed people, when smoking in external places could be connected with this disorder in 16.5% ($P < 0.005$) of the answers. Also, the present study revealed no significant relation between school degree, smoking habits or the presence of children cohabitating the house and the knowledge of the harms of passive and third-hand smoke.

Conclusion: The knowledge of the population about the topic showed itself to be unsatisfying; the majority of the people only associated the health problems in children due to cigarette smoking in the same environment and leading to respiratory diseases.

LBTP1870 | The impact of environmental conditions on the expression of the major fungal allergens Alt a 1 and Ulo c 1—A comparative study on an indoor and outdoor fungal allergen source

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Background: Fungi, ubiquitous organisms, are among the most important inducers of respiratory allergy. *Alternaria alternata*, a fungus omnipresent in the outdoor environment, is one of the best studied fungal allergen sources. The clinical significance of the species' major allergen, Alt a 1, has been well documented. In contrast, much less is known about the allergenic potential of the closely related fungus *Ulocladium chartarum*, a typical indoor-species. We recently identified Ulo c 1, an Alt a 1-homologous allergen, as the major *U. chartarum* allergen. The aim of the present study was to compare the effect of different growth conditions on the expression of Alt a 1 in the outdoor fungus *A. alternata* and Ulo c 1 in the indoor species *U. chartarum*.

Method: Strains of *A. alternata* and *U. chartarum* were cultivated at different temperatures (4°C, 37°C, room temperature), under different conditions of light exposure (darkness, constant light, natural light cycle) and on different carbon sources (glucose, cellulose, methylcellulose). Proteins were extracted from the fungal mycelium and spores and the expression of Alt a 1 and Ulo c 1 was investigated in Western blots using an anti-Alt a 1 antiserum.

Results: We observed that even though the carbon source had an influence on the growth of both fungi, it did not affect the production of Alt a 1 and Ulo c 1. In contrast, light exposure as well as the growth temperature had an impact not only on the fungal growth, but also on the production of both major allergens. While Alt a 1 was predominantly produced at room temperature, Ulo c 1 was also highly expressed at a temperature of 37°C. Furthermore, it was interesting to see that light increased the expression of the major allergens of both species.

Conclusion: In conclusion, we saw that the carbon source, the growth temperature as well as the conditions of light exposure influence the growth of both *A. alternata* and *U. chartarum*. Furthermore, we observed that the exposure to light and the growth temperature also affected the expression of the major allergens Alt a 1 and Ulo c 1. The obtained information will help to optimize the culture conditions for the two allergen sources to allow high allergen expression for the production of improved diagnostic and therapeutic fungal allergen extracts.

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LBTP1871 | Prophylaxis of allergic rhinitis in the light of own research

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Background: Allergic diseases are an important problem in environmental medicine and public health. Undoubtedly, allergic rhinitis absorbs to a large extent due to a number of factors costs, which can undoubtedly be minimized based on ready-made patterns of preventive measures. The purpose of this study was to assess the use of selected forms of secondary prevention by patients diagnosed with perennial allergic.

Method: The study population comprised 18 617 respondents, 4783 of whom were qualified to undergo a medical examination. The study used ECRHS and ISAAC questionnaires adapted for Europe.

Results: Nearly 20% of patients diagnosed with chronic allergic rhinitis used preventive measures against house dust mites; this is in contrast with 13% of the control group ($P = 1.358_{e}^{-07}$). The secondary preventive measures used most commonly in the study group were, in descending order of frequency, mattress protectors and anti-dust-mite spray. Undertaking preventive measures was most common among study participants with a higher education and residents of large cities.

Conclusion: The proportion of patients diagnosed with a dust-mite allergy who undertook preventive measures against perennial allergic rhinitis was relatively low.

LBTP1872 | Effect of living environment on IgE sensitization to the non-biting midge (*Chironomus flaviplumus*, *Chironomus kiiensis* and *Cricotopus bicinctus*)

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Background: Chironomids (non-biting midges) are widely and abundantly distributed near ponds, rivers, and artificially dammed pools used for irrigation. Chironomids contain allergens and cause airway allergic diseases in humans. In this study, we aimed to examine the allergenic potential of chironomids in inhabitants living near artificially dammed pools.

Method: We examined the IgE reactivity to chironomid extract in the sera of residents living around installed dams and assessed the correlations of IgE responses between chironomids (*Chironomus flaviplumus*, *Chironomus kiiensis*, *Cricotopus bicinctus*) and house dust mites (*Dermatophagoides farinae*). Specific IgE antibodies in sera collected from the participants against the extracts were tested using enzyme-linked immunosorbent assay (ELISA).

Results: The averages IgE-positive rates were 10.4%, 8.1%, 8.2% and 14.3% in *C. bicinctus*, *C. flaviplumus*, *C. kiiensis* and *D. farinae*, respectively. Interestingly, people living around installed dams were found to have higher IgE responses to *C. bicinctus* than those living in other places ($P = 0.013$). In addition, the results showed that there was a positive association between HDM-specific IgE reactivity and *C. bicinctus*-specific IgE ($P < 0.0001$).

Conclusion: Our data showed that people living around installed dams were more sensitized by *C. bicinctus* than those living in other places. Further studies are needed to investigate there is a unique allergens in *C. bicinctus*.

LBTP1873 | Respiratory symptoms induced by two new Peach tree pollen allergens: Pru p 9 and Ole e 6-like

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Case report: Peach tree (PT) pollen is entomophilous, not transported by air, and can elicit allergy symptoms in farm workers after occupational exposure. They are considered not relevant in non-exposed people. However in previous studies from our group PT pollen was the third most prevalent in sensitisation after olive and grass. These are data from a population-based study carried out in

Blanca (Murcia region, South-East of Spain) where there are high extensions of peach orchards. We have identified several allergens from PT pollen. These data were also confirmed in children and adolescents of the same region.

We report a case of 12 year old girl living in an area of PT cultivars who in the past 4 years developed symptoms from late February to early June consisting of nasal obstruction, rhinorrhea and sneezing often accompanied with wheezing treated with B_2 inhalers for control. Symptoms appeared at visits or stays in the family farm in the period of Peach tree (PT) flowering and required to avoid exposure by leaving the place. Skin prick test (SPT) were positive to olive, grass and PT pollen and negative to peach fruit as well as Pru p 3. SDS-PAGE immunoblotting showed two allergenic bands recognized by IgE antibodies. These were isolated, purified, sequenced and named: Pru p 9 and Ole e 6-like proteins. The SPTs were positive to both allergens. Nasal challenges with PT pollen and Pru p 9 were positive as well as with Olive tree pollen and Ole e 6-like.

Because sensitisation to Peach tree pollen is highly prevalent in regions of peach cultivars, children directly or indirectly exposed to PT pollen with symptoms in the flowering period must be evaluated. Pru p 9 and Ole e 6-like are peach tree pollen allergens that can be involved in the elicitation of symptoms.

LBTP1874 | Aerobiology of plane tree pollen (*Platanus hispânica* Miller ex Münchh) in Portugal

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Background: The plane tree is widely used as an ornamental in urban environments and its pollen is considered an important cause of pollinosis in Europe. The aim of this study is to analyse the prevalence and aerobiological behavior of *Platanus* pollen in Portugal.

Method: In this study, the daily data of *Platanus*pollen monitoring and meteorological data, between 2002 and 2017, of 9 monitoring centers of the Portuguese Aerobiology Network—RPA: 7 centers in Continent (Vila Real, Porto, Coimbra, Castelo Branco, Lisboa, Évora and Portimão) and 2 in islands (Funchal and Ponta Delgada, Madeira and Azores islands, respectively) were used. For airborne pollen monitoring a Burkard Seven Day Volumetric Spore-trap® and the associate methodology suggested and recommended by European Aerobiology Society—EAS were used. The influence of the meteorological factors on the atmospheric levels of *Platanus* pollen was analysed with Spearman's correlation.

Results: There were qualitative, quantitative and aerobiological differences among the regions. *Platanus* pollen presented, on average, the following representation in the pollen spectrum of the regions; 6% Porto, 9% Coimbra, 6% Lisbon, 8% Évora, 2% Vila Real, Castelo Branco, Funchal and Ponta Delgada and <1% in Portimão. In all localities, the pollination season was very short and occurred during the months of March and April. Concentrations of this pollen in the air outside this period were minimal. The highest daily levels and levels of pollen were recorded in Coimbra and particularly in Évora. There were significant correlations between their levels and the meteorological parameters.

Conclusion: Considering the allergenic potential of *Platanus* pollen and its prevalence in several Portuguese regions, this study provides useful and relevant information to health professionals and general population. As such, complains and pollinosis symptoms related with the aerobiology of this pollen type will be better correlated and accurately evaluated.

MONDAY, 3 JUNE 2019
LB TPS 05
AIRBORNE ALLERGENS AND UPPER AIRWAYS

LBTP1876 | Horse sensitization and allergy to mold, pollen, dust and storage mites, and culicoides in a horse population from southern Portugal

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Background: Allergy in horses may present different forms like recurrent airway obstruction with cough and dyspnea or pruritic hives and eczema, with scaly and crusty alopecia. Those signs may resemble human, cat or dog atopy, but some horses may also present food hypersensitivity, mostly to oat, wheat and corn. Identification of the most implicated allergen sources in each region is then useful for an effective allergy control. Clinical inquiry should be done in the presence of compatible clinical signs, followed by intradermal testing (IDT) for environmental sources and exclusion diets if food allergy is suspected. When environmental or culicoides allergy is suspected, diagnosis should proceed by specific IgE determination, especially if allergen-specific immunotherapy is equated. This study aimed to identify the main allergen sources for horses living in the region of Alentejo, Portugal, allowing better avoidance strategies or immunotherapy.

Method: Twenty one horses (16 males and 5 mares; 13 cross-breed, 5 lusitanic and 3 arabian cross) presenting with compatible clinical signs were selected from a consultation population. Each horse was submitted to clinical inquiry followed by IDT with a battery of 18 commercial allergen extracts from molds, pollens, dust and storage mites, and culicoides. IDT was performed on a left neck trichotomized area, by administering 0.05 mL of each extract and positive and negative controls. Results were read upon 15 minutes for wheal and flare reactions and scored from 0 to 4.

Results: Patients aged 3-29 years old (mean = 13.5 year; SD = 6.645). Twenty individuals presented largely with head and neck, flank, croup and dock pruritic-derived alopecia, and one with sneezing and coughing, with pulmonary wheezing and crackles, and dyspnea. Intradermal results were as follows (table):

Conclusion: No correlation was found between i) IDT response to molds, mites, pollens or culicoides and ii) predominant outdoor or indoor living and sensitization to molds, pollens or mites. Except for the majority of culicoides-sensitized, where a seasonal worsening was found, allergy signs appeared perennial due to a possible continuous prevalence of different molds, pollens and dust or storage mites in horse housing or to a possible food allergy.

LBTP1877 | Expression of estrogen receptor (ER)-α in nasal polyps and the effects of dexamethasone on ER-α expression and apoptosis in RPMI 2650 cells

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Background: Nasa polyps (NPs) are inflammatory outgrowths of sinonasal epithelium, with the most commonly observed association being chronic rhinosinusitis. Glucocorticoids are drug of choice for clinical treatment of NP. There is evidence that the nasal mucosa is affected by estrogen influence. Estrogen receptor (ER)-α, one of estrogen receptors, is known to be related to anti-inflammatory action and also to cell survival in certain tissues. In this study, we examined the presence or absence of ER-α in NP and healthy inferior turbinate mucosa. And we also investigated the effects of dexamethasone on ER-α expression, cell viability, and apoptosis in RPMI 2650 cells.

Method: Immunohistochemical staining and Western blot analysis were performed to determine the expression of ER-α in NP and healthy inferior turbinate mucosa. After treating RPMI 2650 cells with dexamethasone, expression of ER-α was analyzed using Western blot analysis, cell viability was determined using MTT assay, and Western blot analysis and Annexin V-phycoerythrin (PE) staining were used to examine apoptotic cell death.

Results: Western blot analysis showed that ER-α expression was up-regulated in NP tissues. Immunohistochemical staining for ER-α

		Aerogenous molds	Alt a	Asp f	Wild grasses	Art v	Que i	Dac g	Phl p	Lol	Fes r	Par j	Der p	Der f	Lep d	Aca s	Tyr p	Eur m	Culicoides
Positivity (0-4; n = 21)	No.	5	9	5	2	2	0	0	2	10	1	4	3	7	6	5	7	8	14
	Range	1-3	1-2	1-2	1	1	0	0	1-2	1-2	0	1-3	1-2	1-3	1-3	1-2	1-3	1-4	1-4
	Mean	1.75	1.44	1.2	1	1	0	0	1.5	1.3	0	1.75	1.33	1.71	1.33	1.8	1.71	2	2.3
	SD	1	0.53	0.45	0	0	0	0	0.71	0.5	0	0.96	0.57	0.95	0.81	0.45	0.76	1.06	0.9

confirmed the results of the Western blot analysis. When RPMI 2650 cells were treated with dexamethasone, ER-α expression was suppressed, and cell viability was decreased. Furthermore, treatment of RPMI 2650 cells with dexamethasone increased apoptotic cell death, as signified by the increased level of BAX and cleaved caspase-3, the decreased level of Bcl-2, and increased percentage of cells with positive Annexin V-PE staining.

Conclusion: ER-α expression was higher in nasal polyps than in healthy inferior turbinate mucosa. When RPMI 2650 cells were treated with dexamethasone, ER-α expression was downregulated, apoptosis increased, and cell viability decreased. The decrease in cell viability may be related, at least in part, to decreased levels of estrogen receptor α protein, which likely contributed to the induction of cell death in RPMI 2650 cells.

LBTP1878 | The changes of the prevalence of skin prick test in Juju Island based on a Korean multi-center study

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Background: Allergy is a very common condition. Allergic disease is highly affected by environmental changes like temperature or exposure to other people. Conditions to increase the prevalence of Allergic disease have changed dramatically in Republic of Korea (ROK).

Method: A total of 20 hospitals were selected based on population distribution in ROK. A skin prick test (SPT) panel comprising 55 aeroallergens was distributed to 18 hospitals for a prospective study. Results from SPTs done in 2006, 2010, 2014 and 2015 were collected and analyzed retrospectively from 20 hospitals.

Results: We compared allergen-positive rates among seasons. Overall, Positive test rates for D. farina, D. pteronyssinus, cat and dogs were increased over time. And the rates for Cult rye pollen was decreased over time. Although positive rate to pollens varied significantly according to temperature, precipitation, and humidity, the positive rates to house dust mite (HDM) were less susceptible to the changes to environment. But the positive rates to HDMs in Jeju island were higher than other are (Df $P = 0.03$, Dp $P = 0.0195$).

Conclusion: Traditionally the bed and indoor environments are regarded as the main sites of HDM exposure. But our results showed personal exposures to other people, social activity, transportation might be considered as the causes of the increasing positivity of house dust mites because the number of original residents was increased by 20% from 1987 to 2013 but the number of travelers in Jeju island was increased in 2012 by more than 200% since 2000. Therefore, regular follow-up and re-evaluation of allergic test are essential considering changes of society and environment for acceptable diagnosis and treatment.

LBTP1879 | Differentiating eosinophil and neutrophil inflammation in chronic rhinosinusitis with and without nasal polyps

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Background: Chronic rhinosinusitis (CRS) patients are traditionally classified as CRS with nasal polyps (CRSwNP) and CRS without nasal polyps (CRSsNP). CRSwNP is typically characterized by a Th2-biased eosinophilic inflammation, associated with asthma comorbidity, while CRSsNP is often related to a Th1-biased neutrophilic inflammation pattern. In asthma, Th17 is linked to neutrophilic inflammation and the presentation of a mixed Th2/Th17, associated with a mixed eosinophilic/neutrophilic inflammation, is associated with a more severe and harder to control phenotype. In CRS there is no direct link between Th17 and disease severity, while the most severe CRSwNP patient groups have increased concentrations of neutrophilic cytokines as MPO, IL6 and IL8. In CRSwNP, eosinophils have been shown to form EETs. Our aim is to further characterize and compare eosinophilic and neutrophilic inflammation in CRSwNP and CRSsNP.

Method: Neutrophils and eosinophils were quantified in nasal polyp samples (n = 15) and sinonasal mucosae of CRSsNP (n = 17) using IHC staining. Neutrophilic and eosinophilic extracellular traps (NETs and EETs) were visualized and quantified using IF staining. Tissue levels of IL17, IgE, ECP, GM-CSF, and Th2 cytokine levels were measured (Luminex) and correlated to the degree of neutrophilia and eosinophilia and presence of NETs and EETs.

Results: Both CRSwNP and CRSsNP show cases with explicit eosinophilic, a mixed eosinophilic-neutrophilic, or a profound neutrophilic inflammation. In CRSsNP sinonasal mucosa and low Th2-inflamed tissues, neutrophil counts and neutrophil/eosinophil ratios were significantly increased in tissues with high IL17 levels. This was not the case in nasal polyps and highly Th2 inflamed tissues. Neutrophils infiltrate to subepithelial regions in CRS mucosa, and migrate through the epithelium towards mucus in CRSwNP. In CRSsNP patients, NETs were observed and significantly correlated with levels of GM-CSF, indicating a potential role for GM-CSF in local NET formation. EETs were observed in both nasal polyps and CRSsNP sinonasal mucosae and correlated significantly with tissue levels of IgE, ECP and IL5 in both groups.

Conclusion: Variation in eosinophilic and neutrophilic inflammation and differences in EET and NET formation is observed between CRSsNP and CRSwNP. While neutrophilic inflammation and neutrophil/eosinophil ratios correlated with tissue levels of IL17 in patients

with low Th2 inflammation, neutrophilia appeared independent from IL17 in a severe Th2 context.

LBTP1880 | Rhinitis medication use in patients with persistent rhinitis: Belgian cross-sectional study with historical control

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Background: In 2012, we performed a cross-sectional observational study demonstrating a high level of nasal decongestant (over) use compared to nasal corticosteroid use in adults with persistent rhinitis. The results of this study received substantial media attention. In 2017, a comparable study was conducted. The aim of the current evaluation was to compare rhinitis medication use between the 2012 and 2017 study.

Method: In both studies, patients with persistent rhinitis were recruited from community pharmacies. Participants completed a questionnaire collecting data on sociodemographics, clinical characteristics and medication use. We compared rhinitis medication use and long-term use of nasal decongestants (defined as: at least 1 year chronic use) between the 2012 and 2017 study via Pearson Chi-Square tests.

Results: Participants in the 2017 study (n = 1523) had a median age of 50 years (IQR 26 years) and 62% were female. In comparison, participants in the 2012 study (n = 895) had a median age of 46 years (IQR 22 years) and 58% were female. Most frequently reported physician diagnoses were allergic rhinitis (48.1% of participants in 2017 vs 40.6% in 2012) and rhinosinusitis (41.6% in 2017 vs 34.0% in 2012). In the 2017 study, we identified a lower number of nasal decongestant users (37.2% of participants vs 69.6% in 2012, $P < 0.001$) and nasal saline irrigation users (33.4% vs 39.8% in 2012, $P = 0.002$). By contrast, nasal corticosteroid use was significantly higher (63.7% of participants vs 30.3% in 2012, $P < 0.001$) compared to our historical control group. No significant difference could be observed in the use of oral antihistamines (21.6% of participants in 2017 vs 19.4% in 2012, $P = 0.206$). The number of patients with long-term use of nasal decongestants was significantly lower (26.4% of participants vs 42.1% in 2012, $P < 0.001$) compared to the 2012 study group.

Conclusion: We noted a clear shift to more users of nasal steroids and less (long-term) users of nasal decongestants in patients with persistent rhinitis. This shift might be caused by increased public awareness in both patients and healthcare providers resulting from the media attention for our previous study.

LBTP1882 | Allergic factors affect outcomes after endoscopic sinus surgery in patients with chronic rhinosinusitis

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Background: Chronic rhinosinusitis (CRS) is a common health condition in the world. Patient symptoms and objective testing procedures play important roles in identifying appropriate surgical candidates, but discordance between objective testing and quality of life (QOL) has been observed by us and others. To investigate whether the allergic factors impact the severity of chronic rhinosinusitis (CRS), and to explore the correlation of allergy and outcomes after endoscopic sinus surgery (ESS) in patients with CRS.

Method: 145 cases were arranged to detect allergic serum relative index: the concentration of serum total IgE, specific IgE semi-quantitative test and the concentration of serum ECP; to survey QOL status with VAS, SNOT-20, and SF-36; as well as inquire medical record, Lund-Mackay CT system scoring, clinical classification of chronic rhinosinusitis. After FESS (>1 year), 82 cases were followed up.

Results: The improvements of VAS scores of the cases with increased serum total IgE were significantly lower than those without increased serum total IgE ($P < 0.05$). The objective outcomes of the cases with positive allergen (≥3) were significantly worse than those with the positive allergen (<3) ($P < 0.05$). The objective outcomes of the cases with strong positive allergen were significantly worse than those without strong positive allergen ($P < 0.05$). VAS scores and SNOT-20 scores after endoscopic sinus surgery of the cases with strong positive allergen were significantly worse than those without strong positive allergen ($P < 0.05$). The concentration of serum ECP of the invalid cases was significantly higher than ineffective cases ($P < 0.05$). The concentration of serum ECP was positively correlated with Lund-Kennedy endoscopic scores ($r = 0.529$, $P < 0.05$). The objective outcomes of the cases with increased serum ECP were significantly worse than those without increased serum ECP ($P < 0.05$), VAS scores and SNOT-20 scores after endoscopic sinus surgery of the cases with increased serum ECP were significantly worse than those without increased serum ECP ($P < 0.05$), the improvements of VAS scores of the cases with increased serum ECP were significantly lower than those without increased serum ECP ($P < 0.05$).

Conclusion: Those allergic serum relative indexes make some negative effect on subjective and objective outcomes. The results might help to choose immunotherapy to combine with endoscopic sinus surgery for those selected patients to improve the outcomes of CRS.

LBTP1883 | Acceptability and short term efficacy of nasal phototherapy in a small paediatric population, a patient and nursing perspective

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Background: The reported incidence of allergic rhinitis in the U.K. paediatric population is high, and can impact significantly on the child's and family's quality of life (QOL). Despite standard medication some children continue to experience symptoms resulting in poor school attendance, reduced academic performance, restrictions on social activities, and difficult to manage asthma. This service evaluation reports on findings from the first U.K. NHS Paediatric Allergy Unit to provide nasal phototherapy.

Purpose: Explore the acceptability and short term efficacy of nasal phototherapy in a small paediatric population, from the patient and nursing perspective.

Method: Nasal phototherapy was administered to 13, 8-17 year olds from a diverse ethnic and socio-economic background who, despite compliance with standard medical treatment, were all still experiencing rhinitis symptoms impacting on their QOL. 8 Treatments were provided for perennial symptoms and 6 treatments for seasonal symptoms. Treatment was delivered as shown in the methods table. Prior to commencing nasal phototherapy, a diagnosis of allergic rhinitis was made by a paediatric consultant. All children were either Skin Prick Test, sIgE or component test positive to at least one of house dust mite, tree pollen or grass pollen. All children were asked to complete a Total Nasal Symptom Score Sheet (TNSS) prior to commencing each treatment.

Results: All 13 children completed their treatment programme. All patients reported improved TNSS and improved at the end of the treatment. Treatment was well tolerated. The reported side effects were mild, consisting of nasal dryness and mild epistaxis. Children reported that the treatment was fast, effective and pain free. From the nursing perspective the treatment was well tolerated, simple and quick to administer, with few, mild side effects.

TABLE 1. Treatment Protocol

Seasonal	Per nostril mins:secs	Perennial	Per nostril mins:secs
WEEK 1 1	2:00	WEEK 1 1	2:00
2	2:15	2	2:15
3	2:30	3	2:30
WEEK 2 4	2:45	WEEK 2	2:45
5	3:00	WEEK 3	3:00
6	3:00	WEEK 4	3:00
		WEEK 5	3:00
		WEEK 6	3:00

Conclusion: This small service evaluation suggests nasal phototherapy is an effective and acceptable treatment from the child and nursing perspective. The results warrant further investigation on a larger cohort and follow-up to monitor long term efficacy.

LBTP1884 | Cytological monitoring of the nasal mucosa in patients with non-allergic vasomotor rhinitis treated with a new nasal spray formulation

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Background: Non-allergic rhinitis (NAR) are about 23% of chronic rhinitis, reaching 57% of patients affected by rhinitis in the case of mixed rhinitis in which there is both an allergic and non-allergic component. Recently, on the basis of cytological findings, NAR are classified in NARES (non-allergic with eosinophils rhinitis), NARNE (non-allergic with neutrophils rhinitis), (NARMA non-allergic with mast cells rhinitis) and NARESMA (non-allergic with eosinophils and mast cells rhinitis). Treatment NAR has always been very controversial, requiring the use of systemic and topical medications. In this study, we wanted to evaluate the use of an innovative nasal spray containing ribes nigrum, perilla ocymoides, and hyaluronic acid. This nasal spray is designed for the hygiene of the nasal cavity, thanks to the presence of ribes nigrum and perilla oil extracts that exert a soothing and decongestant action in case of a congested nose. Hyaluronic Acid helps soften and heal the mucous membrane.

Method: We used this innovative spray in eight patients aged 26-74 with NAR and we performed a cytological sampling before starting treatment (T0) and after 30 days of treatment (T1). We also gave patients the patient-reported outcomes (PROs) and Sino-nasal outcome test (SNOT-22) questionnaires at T0 and T1.

Results: Six of eight patients treated had improved clinical scores (PROs and SNOT-22) and nasal cytology compared to the start of treatment. No patient discontinued treatment.

Conclusion: These preliminary data show how the nasal spray containing ribes nigrum, perilla ocymoides, and hyaluronic acid is effective in reducing nasal inflammation, expressed as eosinophilic, mastocyte and neutrophil infiltrate, in patients with NAR. Further studies will be necessary to confirm these data.

LBTP1885 | Allergy and cystic fibrosis—Risk factors for chronic rhinosinusitis at child

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Background: Chronic sinusitis defined as a chronic inflammation >3 months of the nasal mucosa and paranasal sinuses, is a rare pathology in the childhood but with a major impact on morbidity and the quality of life through the complications that it generates. Clinical manifestations are related to the anatomical and immune particularities associated with childhood age and some predisposing/aggravating factors, such as nasal allergy (AR) and cystic fibrosis (CF).

Objective: To identify the incidence and risk conditions associated with cystic fibrosis and nasal allergy for the chronic rhinosinusitis of the child.

Method: is a retrospective study on the 43 children diagnosed with chronic rhinosinusitis in the period 2014-2018 in the Department of Immunoallergology in Children's Emergency Hospital "St. Mary "Iasi.

Results: AR 17/43 (39.53%); CF 6/43 (13.95%); <6 years: AR 6/17 (35.29%), CF 2/6 (33.33%); localization: maxillary sinusitis—AR 9/17 (47.36%), CF 4/6 (66.66%); fronto-maxillary sinusitis—AR 8/17 (47.05%), CF 2/6 (33.33%); AR persistent severe 6/17 (35.29%), moderate 11/17 (64.7%); AR comorbidities: chronic adenoiditis 9/17 (52.94%), atopic dermatitis 4/17 (23.52%), bronchial asthma 7/17 (41.17%), upper respiratory infections 6/17 (35.29%) allergic polysensibilization: AR 15/17 (88.23%), CF 3/6 (50%); pollen mono allergic sensitization AR 2/17 (11.76%); aspergillus spp/alternaria spp mono allergic sensitization : AR 2/17 (11.76%), CF 3/6 (50%); IgA-immune deficit AR 8/17 (47.05%), CF 4/6 (66.66%); clinical manifestations: chronic headache/facial pain—AR 11/17 (64.7%), CF 6/6 (100%); chronic cough—AR 14/17 (82.35%), CF 6/6 (100%); chronic rhinorrhea—AR 15/17 (88.23%), CF 3/6 (50%); orbital cellulitis-AR 3/17 (17.64%), CF 2/6 (33.33%); sleep disorders AR 9/17 (52.94%), CF 5/6 (83.33%); halitosis—AR 4/17 (23.52%), CF 2/6 (33.33%); specific imaging (CT-SCAN/Rx) opacification of the sinuses—all cases; sinus hypoplasia: CF 4/6 (66.66%).

Conclusion: Chronic rhinosinusitis in children is heterogeneously clinical in relation to the particularities of immunogenic and anatomical responses reported in child's age. Multidisciplinary team collaboration can quickly diagnose the involvement of aggravating factors such as allergic rhinitis and cystic fibrosis.

LBTP1886 | NAPPREB study protocol: A pivotal clinical trial to investigate clinical efficacy and potential response biomarkers to Benralizumab treatment in chronic rhinosinusitis with nasal polyps

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Background: chronic rhinosinusitis with nasal polyps (CRSwNP) is a severe upper-airway inflammatory disease, with a high rate of recurrence after surgery, a significant impact on the Quality of Life of patients, and high disease-related costs. Most of the patients with CRSwNP have important eosinophilic inflammation in both upper and lower airways. Benralizumab is a monoclonal antibody against IL5-receptor alpha-chain and it is approved for the treatment of severe eosinophilic asthma.

Method: The aim is to describe the protocol for a clinical trial to investigate the efficacy of Benralizumab on CRSwNP and to explore, in an unbiased manner, potential response biomarkers.

Results: the "NAsal Polyps inflammatory & molecular Phenotyping of Responders to Benralizumab" (NAPPREB) study is a single-center, double-blind, placebo-controlled randomized trial on 20 patients with severe CRSwNP (requiring at least 1 g oral prednisone over the previous 12 months to control symptoms and with a nasal endoscopic score, NPS ≥5). Patients will be randomly assigned to treatment (Benralizumab 30 mg s.c. every 4 weeks for the first 3 doses, and then every 8 weeks) or placebo in a 1:1 ratio. Treatment duration will be 16 weeks, followed by a 36 weeks post-treatment follow-up. Primary outcome: significant reduction of NPS≥1.5 at week 24; secondary outcome: unbiased correlations between clinical response and biomarkers, including: blood eosinophils and tissue biomarkers (detected by proteomic analysis).

Conclusion: the NAPPREB study is a clinical trial investigating simultaneously clinical efficacy and potential response biomarkers in patients with severe CRSwNP.

Study funded by AstraZeneca

LBTP1887 | Glucocorticoid inhalation combined with olfactory training in the treatment of chronic sinusitis olfactory dysfunction

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Background: Olfactory dysfunction caused by chronic sinusitis was common; however the effective treatment is still under discussion.

Method: A total of 39 chronic sinusitis (CRS) patients with olfactory dysfunction (post chronic sinusitis) in China-Japan union hospital during Jan 2017 to June 2018 were recruited in this prospective study. EPOS 2017 was used for CRS diagnosis. Patients with malignant tumor, diabetes history, hypertension history, hyperlipidemia history, asthma and other chronic respiratory diseases were excluded from this research. The clinical data including age, gender, and duration of disease, smoking history, and alcohol history were collected and analyzed. All patients underwent Sniffin' sticks olfactory test twice (before and after treatment), which was evaluated by composite threshold-discrimination-identification score (TDI), sinonasal computer tomography scanning, as well as magnetic resonance scanning of the olfactory pathway. Nebulizing glucocorticoid (Budesonide) was inhaled once daily at the starting dose of 2 mg tapered to 1 mg after 2 weeks combined with olfactory training for 28 days. SPSS 13.0 software, paired t test were used to analyze the data.

Results: Thirty five patients received treatment, with a mean age of 49 (range from 31 to 67 years old), a mean olfactory dysfunction duration of 5 months (2.5-10 months). Around the patients, 10 were anosmia, 29 were hyposmia. After olfactory training and nebulizing glucocorticoid inhalation, the total scores of TDI increased with statistically significant (20.6 ± 6.2 vs 13.2 ± 5.5). The overall efficacy was 48.5% (17/35), complete recovery were achieved in 3 patients (8.5%), obvious improvement in 7 (20.0%), improvement in 5 (14.3%), no improvement in 2 (5.7%).

Conclusion: The outcomes suggest the efficiency and safety of glucocorticoid combined with olfactory training in the treatment of olfactory dysfunction caused by chronic sinusitis.

LBTP1888 | Multivariate regression analysis of epistaxis to predisposing site and treatment

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Background: Epistaxis remains the most frequent otolaryngologic emergency and the second most common reason for referral to an otolaryngologist. Over the years, many studies have sought to develop algorithms for treatment and prevention. Despite this, management of epistaxis remains a controversial and evolving topic. As a clinician, it is very important to find the bleeding point quickly and stop the bleeding in time. In order to explore the preexisting sites of nasal bleeding and the relationship between relevant factors affecting nasal bleeding, we conducted a retrospective analysis on the data of 152 patients with nasal bleeding who visited our department from September 2016 to August 2017.

Method: 152 cases of nosebleed patients admitted to our department from September 2016 to August 2017 were selected as research objects. Inclusion criteria :1. There were clear bleeding points in nasal endoscopic examination; 2. 2. Rare bleeding points were excluded after analysis and summary; 3. Exclude nosebleed caused by diseases of the blood system, surgery, trauma and nasal tumor. Survey contents include: 1. General items: gender, age; 2. Personal history: smoking and drinking habits; 3.Concomitant diseases;

Results: The four common parts of nasal hemorrhage were: Little's area, olfactory cleft, fornix of inferior nasal concha and middle meatus. The age of patients had a certain relationship with the bleeding site, and Little's area was the most common bleeding site, which can occur at any age. in addition, fornix of inferior nasal concha was the common site of bleeding of patients under the age of 50 patients while olfactory cleft of the elderly. There had no significant relationship between middle meatus bleeding and age. Patients under the age of 50 male were significantly more than female while there had fewer gender differences in patients over 50 years old. Hypertension, diabetes and cardiovascular disease are the most common accompanied disease associated with nasal bleeding.

Conclusion: The age of patients had a certain relationship with the bleeding site. Gender, age, history of tobacco and alcohol, accompanied with hypertension, diabetes and cardiovascular disease are important factors of epistaxis.

LBTP1890 | The analysis and study on the classification and clinical features of eosinophilic chronic rhinosinusitis

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Background: Chronic rhinosinusitis is a heterogeneous disease. In Europe and the United States, it has recently been divided into two subgroups: chronic rhinosinusitis with nasal polyps (CRSwNP) and chronic rhinosinusitis without nasal polyps (CRSsNP). The majority of CRSwNP cases have a strong tendency to recur after surgery and show eosinophil-dominant inflammation.

Method: According to postoperative histopathological examination and percentage of nasal tissue eosinophils, ECRS was determined as the percentage of eosinophil was 15% or more and NECRS as the percentage was <15%. Evaluated all patients' clinical features by recording symptom scores and duration, testing peripheral blood EOS% level, doing nasal endoscopy and sinus CT to assess the severity of nasal cavity, comparing symptom scores before and after surgery.

Results: There were no significant differences in the sex and age between the three groups of CRS cases with different histopathological type ($P > 0.05$). But the difference of three groups according to the degree of eosinophil infiltration in the tissue was obvious ($P = 0.000409$).

There was no regular trend in ECRS composition or percentage of nasal tissue eosinophils in the past 12 years.

There was no significant difference in sex and age between ECRS group and NECRS group ($P > 0.05$).

The duration of ECRS was 12.00 [5.50; 30.00] months, and the NECRS group was 9.00 [2.50; 36.00] months, the difference was not statistically significant ($P > 0.05$).

The peripheral blood eosinophil percent in the ECRS group was 5.10 [3.00; 7.60], which was significantly higher than that of the NECRS group (1.90 [1.20; 3.55]), and the difference was statistically significant ($P = 6.14\times10\text{-}10$). The tissue eosinophil percent was associated with peripheral blood eosinophil percent in ECRS ($r = 0.49$). When peripheral blood EOS% ≥4.15%, the sensitivity of diagnosis of ECRS was 64%, and the specificity was 81.8%.

Conclusion: CRS in the northeastern region of China can be classified according to the degree of eosinophil infiltration in the tissue. In the past 12 years, the trend of ECRS composition ratio has no significant characteristics. Compared with NECRS, ECRS had heavier sinus lesion range and extent, in which the ethmoid sinus was the most serious and the posterior ethmoid sinus and maxillary sinus were most vulnerable, and ECRS is more susceptible to the pansinusitis. Increased percentage of peripheral blood eosinophils can be used as a reference index for preoperative CRS typing.

LBTP1891 | Immunotherapy and medication supervision improved quality of life in adult with allergic rhinitis, a longitudinal study

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Background: Immunotherapy is widely used in the treatment of allergic rhinitis recently. However whether the quality of life in adult patients who underwent immunotherapy and medication supervision was improved or not is still under discussion.

Method: Permission for this longitudinal clinical study was obtained from the Research Ethics Committee of China Japan union hospital of Jilin University (Changchun, China). Informed consent was obtained from the study patients. All statistical analyses were performed using SPSS statistics (Version 17.0, IBM, NY, USA). The a-priori sample size estimation was performed at the 5% level of significance ($\alpha = 0.05$). One hundred and forty-two patients visiting our out-patient department, from March 2009 to August 2018, who were diagnosed as allergic rhinitis according to ARIA 2016 were collected. The patients were underwent immunotherapy or medical intervention during the study. The Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) was used for evaluating the treatment effect. Both the telephone interview and face-to-face questionnaire survey were used to fulfill the RQLQ. All the patients were dived into two groups by using immunotherapy or not: 37 cases underwent immunotherapy (defined as IT group), 105 cases didn't accept immunotherapy (defined as UIT group) but underwent medical intervention which following the guideline ARIA2016. The UIT group were dived into two subgroup by whether the patients accepted medication supervision or not.

Results: Nose and eye symptoms of patients who received immunotherapy were improved significantly ($P < 0.01$). The quality of life of patients with allergic rhinitis who received medication supervision was greatly improved compared with it before the treatment ($P < 0.05$). The quality of life of patients who accepted medication supervision was improved significantly compared with it of the patients who didn't accept the medication supervision ($P < 0.05$). Nose symptoms were significantly improved in patients of both the IT group and the UIT group who accepted medication supervision.

Conclusion: The quality of life of patients with allergic rhinitis was improved significantly, no matter the ones accepted immunotherapy or medication supervision.

LBTP1892 | Quality of life assessment before and after long-term treatment of allergic rhinitis in adults—10 years

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Background: Allergic rhinitis is a common disorder that is strongly linked to asthma and conjunctivitis. It is usually a long-standing condition that often goes undetected in the primary-care setting. The classic symptoms of the disorder are nasal congestion, nasal itch, rhinorrhea, and sneezing. A thorough history, physical examination, and allergen skin testing are important for establishing the diagnosis of allergic rhinitis. Using the quality of life questionnaire (RQLQ) related to nasal conjunctivitis, the effects of adult allergic rhinitis patients on quality of life before and after treatment were evaluated, and the theoretical basis was provided for improving the quality of treatment and treatment compliance.

Method: The patients who were diagnosed and treated by allergic rhinitis in the nasal clinic of the hospital between 2007.03 and 2008.08 were selected. The patients were followed by telephone and used the RQLQ. 142 patients were selected. Among them, 37 patients received specific immunotherapy. As a SIT group; The remaining 105 patients were divided into A1 and B1 groups, and the classification criteria were whether they had received guidance on drug application; Divided into A2 and B2 groups, the classification criteria are whether they have been supervised by drug applications. The research data are analyzed and processed using SPSS 17.0 software.

Results: The improvement of the quality of life after treatment was more obvious and statistically significant in AR patients receiving drug guidance and drug supervision than before treatment ($P < 0.05$). The improvement of nasal symptoms and eye symptoms after immunotherapy is more obvious than before treatment, and it has statistical significance ($P < 0.01$). Post-treatment drug guidance and drug supervision are significantly less effective in improving the quality of life than in the absence of drug guidance, which is statistically

significant ($P < 0.05$). The improvement of immune therapy in nasal symptoms is more obvious than drug guidance and has statistical significance ($P < 0.05$). In addition, there is no correlation between the influence of education on daily life and the influence of gender on emotion.

Conclusion: The quality of life of AR patients can be improved after receiving treatment. Strengthening the guidance and education of AR patients can improve the quality of life of AR patients.

LBTP1893 | The analysis and study of allergen features in chronic rhinosinusitis with or without polyps

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Background: Allergen features were compared in the two subtypes of CRS: chronic rhinosinusitis with nasal polyps (CRSwNP) and chronic rhinosinusitis without nasal polyps (CRSsNP). To study the distribution features and clinical significance of allergens in patients with chronic rhinosinusitis (CRS) and chronic rhinosinusitis with polyps (CRSwNP).

Method: A retrospective analysis was performed in 187 cases of CRS and CRSwNP. Differences of allergens features of CRS were analyzed, and they were compared to the allergens of 65 patients with allergic rhinitis (AR).

Results: The total allergen positive rate in CRS was 49.8%. The allergen positive rate, distribution proportion of inhaled and food allergens, distribution proportion of allergens subsets, distribution proportion of single and multiple allergens between two subtypes of CRS had no significant difference ($P > 0.05$). The major allergens of CRS were single inhaled allergens (72.3%). Some CRS patients were allergic to food allergen (8.6%). The minority allergens of CRS were a mixture of inhaled and food allergens (7.2%). Compared to AR, the distribution proportion of inhaled and food allergens ($\chi^2 = 17.81$, $P < 0.001$), the distribution proportion of allergens subsets ($\chi^2 = 15.51$, $P < 0.001$), and the distribution proportion of single and multiple allergens ($\chi^2 = 9.727$, $P < 0.001$) had a significant difference.

Conclusion: The allergen positive rate of CRS is much higher than the prevalence of allergic diseases in the general population, suggesting that allergic factors may be closely correlated to the pathogenesis of CRS. The clinical features of allergens are similar in the two subtypes of CRS, while there are significant differences in allergen distribution between CRS and AR patients. The detection of allergens may be helpful in the prevention and treatment of CRS.

LBTP1894 | Evaluation of olfactory function as a potential biomarker in patients with Mastocytosis

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Background: Mastocytosis is a clonal disease characterized by an accumulation of mast cells in various organs, such as skin, bones, lymph nodes, liver, spleen, peripheral and central nervous system, gastrointestinal and nose-pharyngeal tract. The serum tryptase, an enzyme produced almost exclusively by mast cells is considered as a biomarker. The serum concentration of tryptase can therefore be considered a quantitative sign and an indicator of activity of the organism's mast cells. The aim of the study was first to investigate odor threshold (OT), odor discrimination (OD) and odor identification (OI) in mastocytosis patients (MP) compared to age matches healthy controls (HC), then to correlate olfactory function with, serum tryptase.

Method: Eighty subjects were enrolled in this study (40 patients with mastocytosis, 18 women and 22 men, mean age 47.9, SD 14.4 and 40 healthy controls, 16 women and 24 men 47.9, SD 14.7). OT, OD, OI and their sum TDI score were evaluated using the psychophysical Sniffin' Sticks. The Montreal Cognitive Assessment (MoCA) was used to assess cognitive ability. One way between groups Multivariate analyses of variance (MANOVA) was carried out to assess the impact of olfactory function on the mastocytosis.

Results: Among MP group, 10 (25%) reported normosmia, one patient functional anosmia and the remaining showed hyposmia. Our results indicated a statistical significant differences between the two groups (MP and HC) for the olfactory function and the MoCA [$F_{(5,74)} = 504.7$, $P < 0.0005$, Wilks' Lambda = 0.03, partial $\eta^2 = 0.972$]. The analyses of each individual dependent variable, using Bonferroni adjusted alpha level showed significant differences between two groups for OT [$F_{(1,78)} = 866.6$, $P < 0.0005$, partial $\eta^2 = 0.917$], OD [$F_{(1,78)} = 76.6$, $P < 0.005$, partial $\eta^2 = 0.495$], for TDI [$F_{(1,78)} = 379.6$, $P < 0.005$, partial $\eta^2 = 0.830$] and for MoCA [$F_{(1,78)} = 146.3$, $P < 0.005$, partial $\eta^2 = 0.652$]. Instead, no statistical significant difference was found for OI [$F_{(1,78)} = 0.62$, $P > 0.05$, partial $\eta^2 = 0.008$]. Significant negative correlation was observed between the TDI vs serum tryptase ($r = -0.398$, $P < 0.05$).

Conclusion: Our data suggest that olfactory dysfunction could represent a potential biomarker to be more extensively evaluated for an early diagnosis of Mastocytosis.

LBTP1895 | Study of aero-allergens and mites in rural part of Eastern India by skin prick testing

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Background: Skin prick testing (SPT) is one of the most extensively used screening and diagnostic tool in contemporary allergy practice and considered the cornerstone of allergy diagnosis. It plays a vital role in diagnosis of type 1 hypersensitivity reaction in patients with rhinoconjunctivitis, asthma, urticaria, anaphylaxis, atopic eczema and suspected food and drug allergy. It can be used to incite an immediate hypersensitivity response in the skin when the stratum corneum is punctured resulting in exposure of the epidermis to an allergen solution.

Method: A total of 50 subjects (25 males and 25 females) were selected for the present study. Complete history and clinical symptoms were recorded according to ARIA guidelines. All the patients were subjected to SPT using 35 allergens. Informed consent was taken regarding the same. Positive sensitization was recorded in terms of frequency, measured in terms of wheal diameter and subjected to statistical analysis using STATA 14 software.

Results: The most common allergens observed were Gynandropsis gynandra (positive sensitization in 33 cases with wheal of 4.18 mm diameter) followed by Dermatophagoides farinae (25 cases, 6.12 mm diameter), Ageratum conyzoides (19 cases, 3.36 mm diameter), Cannabis sativa (17 cases, 3.52 mm diameter) and Cassia occidentalis (17 cases, 3.58 mm diameter). When the sensitivity was being compared between the most common allergens, statistical significance was obtained for Ageratum conyzoides and Cannabis sativa with Dermatophagoides farinae (*P* value −0.0001).

Conclusion: This study was an attempt to evaluate the pattern of allergenicity of aero-allergens and mites in the rural part of Eastern India using SPT. It is a reliable, minimally invasive procedure with immediate results useful in detection of tissue bound IgE and an atopic state in patients with type 1 allergy.

MONDAY, 3 JUNE 2019
LB TPS 06
RISK FACTORS, DIAGNOSIS AND QUALITY OF LIFE IN PEDIATRICS

LBTP1896 | The value of autonomic status for the control of bronchial asthma at children

Tush E[1]; Eliseeva T[1]; Bulgakova V[2]; Khaletskaya O[1]; Prakhov A[1]; Balabolkin I[2]

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Background: Violation of vegetative regulation (VR) is a component of the pathogenesis of bronchial asthma (BA). Assessment of autonomic function in the management of patients with asthma in routine clinical practice is not provided. However, the state of VR in patients with asthma continues to be of interest to researchers, especially in the aspect of the relationship of VR parameters with the parameters of control of asthma. Purpose: Determine the relationship of VR parameters with the parameters of asthma control level in children using methods available in a wide clinical practice.

Method: 88 patients (54 boys and 34 girls) aged 5-17 years with atopic bronchial asthma were examined. Quantitative assessment of bronchial asthma control was carried out using questionnaires Asthma Control Questionnaire-5 (ACQ-5), Childhood Asthma control test (ACT-C) in children under 12 years old, and Asthma control test (ACT) in children and adolescents aged 12 years and older. All children underwent a standard examination with determination of blood pressure, pulse, respiratory rate, with the calculation of Kerdo and Hildebrandt indices, characterizing vegetative regulation. Taking into account the age-dependent changes in heart rate, we used for the first time a relative heart rate index equal to the ratio of the patient's heart rate to the median heart rate for this age group.

Results: Correlation with ACQ-5 was obtained for the Hildebrandt index (r = 0.45 P = 0.0003), the respiratory rate (r = −0.27, P = 0.032) and the relative pulse index (r = 0.40, P = 0.0012). The association of Kerdo index with ACT-C test values (r = −0.32, P = 0.045) was established. In the group of patients with no BA control the Hildebrandt index was statistically significantly higher than in patients with control of the disease. In children with uncontrolled asthma it was 5.23 ± 0.25 units that exceeds normal values and may reflect a mismatch in the work of cardiovascular and respiratory systems.

Conclusion: The interrelation of changes of vegetative regulation and the level of control of bronchial asthma in children is established, as well as the mismatch of the functioning of the cardiovascular and respiratory systems in children with uncontrolled asthma.

LBTP1897 | Thyroid status at children with bronchial asthma (BA)

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Background: Despite numerous studies, there was no consensus about the effect of thyroid hormones on asthma. Purpose: To assess the relationship between the patient's thyroid status and the level of BA control.

Method: 51 children with BA were examined, of them 15 girls aged 105.1 ± 35.3 and 36 boys aged 114.2 ± 14.1 months. All children underwent general clinical examination, spirometry, ACQ5 assessment, determination of thyroid-stimulating hormone (THS) levels, free thyroxine (free T4) test, and levels of antibodies to thyroperoxidase (anti-TPO) by ELISA.

Results: Elevated TSH levels occurred in 12 (23%) patients, while all of them had no clinical symptoms characteristic of hypothyroidism, and the maximum TSH rise was 8.45 mIU/L, which made it possible to treat this condition as subclinical hypothyroidism (cGT). None of the patients had an increase in the level of anti-TPO. Another 15 people had a TSH level in the range of 1.16-1.97 mIU/L, the remaining 24 had 2.01-3.74. 18—had an excess of T4 free, but it was insignificant—a maximum of 23.1 pmol/L at the upper limit of the norm of 22 pmol/L, and was not accompanied by symptoms of thyrotoxicosis. We did not obtain a clear correlation between the level of TSH and free T4, R = 0.49, P = 0.4852. A weak negative correlation was found between the TSH level and the ACQ-5 score, R = −0.29, P = 0.033. Most often (in 33% of cases) subclinical hypothyroidism occurred in patients with complete control of BA (28, TSH 3.39 ± 1.96), and was completely absent in patients with uncontrolled disease progression (5, TSH 1.87 ± 0.73). In patients with partial BA control, TSH levels of 2.0-4.1 IU/L (18, TSH of 2.93 ± 1.5) prevailed, which may indirectly indicate iodine deficiency. These differences do not reach the level of statistical significance (F = 1.74, P = 0.1858). Free T4 levels were comparable in all groups (16.57 ± 1.93, 16.67 ± 3.04, 15.82 ± 4.93, respectively). Despite this, a negative correlation was noted between the level of free T4 and FEV1 (mL/s), R = −0.42, P = 0.01. Normal levels of TSH in the group of patients with poor BA control may not be associated with the best thyroid function in this group of patients, but with an inhibitory effect on the TSH synthesis of corticoid hormones (both exogenous glucocorticoids and endogenous—produced by the body on stress—exacerbation of BA).

Conclusion: Patients with achieved BA control have a rather high incidence of subclinical hypothyroidism (23%).

LBTP1898 | MMR immunisation practices in children with a history of egg allergy

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Background: Immunization is the most important primary care health measure for the prevention of certain infectious diseases. In the presence of food allergies, especially egg allergies, primary care providers in Turkey avoid vaccine administration and refer the children to the tertiary health care centers. In this study, we retrospectively evaluated the characteristics of children, who had allergies or suspected allergies and referred to our well child clinic in a university hospital for the administration of their vaccines.

Method: Charts of all children, who were referred to our outpatient clinic due to concerns for allergies in the last 2 years were retrospectively reviewed. Data regarding age, sex, allergy history, delay in the administration of vaccine, laboratory test results, referral of which vaccine, opinions of allergists before immunization and reactions after immunization were extracted from the charts. The study was approved by the local ethics committee.

Results: A total of 122 children with or without an allergist made diagnosis of allergies were referred by their primary health care providers. According to families' statement and notes from family physicians, 47 children (40.9%) had reactions with egg, 40 (34.8%) with multiple foods, 9 (7.8%) with milk, 8 (7.0%) with a previous vaccination,1 (0.8%) with medicine and in the remaining children the offending agent was either unknown or the data were unavailable in the charts. The most common reported reaction was rash (n = 84, 68.8%). Only 9 children had a history of anaphylaxis. Egg white allergy was positive in 51 (54.3%) children and 24 (19.7%) children had positive testing for egg yolk. Median delay in the administration of MMR vaccine was 20.0 days (Interquartile range 8.7-41.2). Twelve children were undergone skin prick testing with the vaccine (8 with MMR). In 6 children (4 with MMR and 2 with 4th month vaccinations), vaccines were administered in increasing amounts according to allergists suggestions. No allergic reaction was observed after vaccine administration except for one child reporting a slight rash several hours after MMR vaccination.

Conclusion: Food allergies, especially egg allergy, are the most common barrier of vaccine administration in children referred from family physicians to our outpatient clinic. Given the absence of any reactions, our practice supports the administration of MMR vaccine in primary care centers even in egg allergic children to prevent delays in national vaccine schedule.

LBTP1899 | Risk factors in IgE mediated allergy in infants—Cases study

Alexoae MM; Rugina A; Murgu AM; Azoicai AN; Criscov IG; Popovici P; Stana BA; Hogas MM; Ioniuc IK

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Background: The skin, respiratory and gastrointestinal allergy manifestations can evolves alternatively or concomitant in the first years of life; food sensitization is the common etiology. There are some risk factors there are common to major of country and other specific for some regions.

Method: The objective of this study is the assessment of IgE-mediated food allergy regarding clinical manifestations and their correlation with risk factors, the dietary and drug therapy impact during a 22 months monitoring. We performed a retro-prospective study on 116 infants and young children diagnosed with IgE mediated food allergy, admitted in II Pediatric Clinic, Sf Maria Hospital Iasi, Romania—4 years surveillance.

Results: The onset food allergy manifestations (mean age 5-11 months) involve skin (66 cases), respiratory (55 cases) and/or gastrointestinal tract (5 cases). We evidenced respiratory aeroallergens sensitization (bronchial asthma and/or allergic rhinitis) in 50 percent of cases. 43 children achieved oral tolerance for one or more foods, most commonly in milk and egg white allergy. The artificial feeding in the first hours of life, urban environment, the simultaneous exposure air pollutants, early food diversification, familial atopy, C section birth were the risk factors with an individual share over 40%. Early and repeated administration of antibiotics has been entered with a frequency of 29.3% of the total cases.

Conclusion: Inappropriate dietary practices during infancy, including the delayed introduction of complementary feeding and exclusive breastfeeding <3 months, and more frequent use of antibiotics during the first year of life, were associated with food allergy development. Cow's milk and eggs, were the most common allergens among children with food allergy and were associated with atopic diseases such as asthma and atopic dermatitis. Some of this risk factors can be avoid by promoting the breastfeeding and natural birth or by less antibiotic use in our country.

LBTP1900 | Extrahepatic manifestations with immune mechanism in children with chronic hepatitis

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Background: Besides hepatic manifestations and within the whole digestive system, there is a spectrum of extrahepatic manifestations in all chronic hepatitis, regardless of etiology but closely related to it and pathogenic ways of interrelation with the host organism. Formation

and storage of circulating immune complexes in tissues and organs represent the main action of these events. In children, they have a particular character and they can influence the long-term prognosis for the patient, so that should be evaluated and treated early.

Method: We have investigated a total of 239 patients followed during 2005-2011, with chronic hepatitis of various etiologies and extrahepatic manifestations, using the database for measuring and extracting data used in statistical processing. Extrahepatic manifestations were quantified, explored and correlated with parameters of evolution and prognosis.

Results: In patients with chronic HBV, the prevalence of extrahepatic manifestations was 21.28%, in children with chronic HCV 15.43%, and 35.55% in those with hepatitis B and D. The most common extrahepatic manifestations are hematological (8.78%), including lupus-related phenomena, dermatological (6.76%), rheumatic events (5.56%). There were also patients with autoimmune myopathy, cryoglobulinemia and glomerulonephritis. We reported also two patients with Overlap syndrome (autoimmune and chronic viral hepatitis). Also, behavioral disorders and depression were determined in some patients included in the study group. The most common subjective complaints involved arthralgia, myalgia, and asthenia. The most common extrahepatic manifestations related to clinical examination were adenopathies (41%), urticarial manifestations and respiratory pathology being rather rare. Extrahepatic manifestations-related comorbidities were represented primarily by acrocyanosis and bruising, followed by obesity and dermatologic disorders.

Conclusion: Immune-induced extrahepatic manifestations were found in pediatric patients, regardless of the type of chronic hepatitis. In some cases, interferon triggered or worsened some extrahepatic autoimmune manifestations (mainly cutaneous manifestations), requiring evaluation of the therapeutic options. Specific guidelines are needed for particular situations in order to minimize the side effects and to maximize the pathogenic disease-modifying therapy results.

LBTP1901 | What does mothers of children with food allergy searching on social media?

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Background: The widespread use and the ease of accessing information through the internet has been a source of many knowledge for parents of children with food allergy. Not only professional medical web sites but also non-qualified social media bloggers are constantly sharing their experiences and knowledge on food allergy. While this may help the family to cope with the idea of living with food allergy, the reliability of these information should be met with suspicion, since they can sometimes be misleading. The aim of this study was to investigate the effects of the social media on mothers of food allergic children who admitted to our clinic.

	Min-Max	Mean ± SD
Age of mothers (years)	18-54	29.87 ± 5.65

Education	N	%
Primary School	13	10.4
Junior High School	27	21.6
High School	38	30.4
University	47	37.6

	Min-Max	Mean ± SD
Age of children (months)	2-120	21.62 ± 21.56

	N	%
Sex of children		
Male	71	56.8
Female	54	43.2
Diagnosis of children		
Atopic Dermatitis	64	51.2
Urticaria	30	24.0
Anaphylaxis	10	8.0
Non-IgE food allergy	32	25.6
Culprit food		
Cow's milk	31	24.8
Hen's egg	35	28
Cow's milk and hen's egg	42	33.6
Multiple food	15	12
Others	2	1.6

Method: Mothers of food allergic children were asked to fill in a questionnaire including questions about socio-demographic data and usage of social media. Non-volunteers, non-native Turkish speakers and illiterate mothers were excluded from the study.

Results: There were 125 mothers who fulfilled the questionnaire, and 100 (96%) of them reported that they were using social media to gather information about food allergy. More than half of them (62%) were searching for an advice on management including allergen free recipes and physician name. One third (36%) of them were seeking for dietary advices. Of the responders, 16. 9% claimed that there was a discordancy about the content of diet between their physician's advice and the advice that they found online. Although 66% of the participants did not trust the information found from internet, 55% of them applied these advices to their children (Tables 1, 2).

Conclusion: Mothers of food allergic children frequently use social media. Professional websites of allergy associations, medical units and allergists should be easily accessible and must contain comprehensible knowledge to overcome misleading information on different websites and help food allergic children's parents to cope with the idea of living with food allergy.

LBTP1903 | The influence of atopic risk factors on evolution of subglottic laryngitis in children

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Background: Subglottic laryngitis is a common respiratory tract infection among children between 6 months and 6 years of age. The first aim of this study is to evaluate the effects of some sociodemographic parameters in the evolution of subglottic laryngitis and to compare the influence of this parameters on the incidence and evolution of subglottic laryngitis in a group with atopic risk factors.
Method: This retrospective study enrolled 304 children aged 0-6 years hospitalized in Emergency Hospital for Children "St. Mary" Iasi with subglottic laryngitis during a period of 3 years. The anamnesis regarding sociodemographic parameters was a key point in data collection.
Results: Age distribution, male sex, lower parental education, parental history of atopy, prematurity, neonatal respiratory diseases, previous hospitalization for a respiratory disease, living in a house, small home size, residence in green areas, smokers at home and absence of an air conditioning system at home were significantly more frequent in the atopic group than in the other lot.
Conclusion: There is a significant association between environmental allergens and the severity of the evolution of subglottic laryngitis. The main risk parameter factor was smoke and the presence of allergen factors in the atopic pediatric group. Recognition and avoiding these nocive factors can lead to a better evolution of the subglottic laryngitis in pediatric population, respectively 0-6 years of age, especially in the presence of atopy.

LBTP1904 | Evaluation of sports habits of children with asthma and factors effecting these habits

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Background: There are limited number of studies on sports habits and factors that affecting these habits in children. Therefore, in our study we planned to evaluate the sports habits of the patients with asthma, the approaches of their families about their sports habits and the positive/negative factors affecting these habits.
Method: Pediatric patients aged between 7 and 18 years who were followed up with the diagnosis of asthma at the Allergy clinic of our hospital were evaluated. Sociodemographic characteristics, disease control status and treatment follow-up compliance, family characteristics, sports habits of the patients and the attitude of families and teachers were questioned.
Results: The study was a cross-sectional observation study and 130 patients were examined. 51.5% of the patients were male. According to the sports habits, 24.4% had sports license and took part in a sports team and 39.8% were regularly involved in sports.
Conclusion: n our study, we identify that negative thoughts of the families, low education level, severe attacks, insufficient support of teachers and the physician insufficient information transfer to the patient are involved with sports behavior which is negatively affected in children with asthma. Therefore, it has been seen that parents, physical education teachers and sports trainers should be informed in more detail about this issue.

LBTP1905 | Investigation of factors triggering asthma attack in childhood

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Background: Acute asthma exacerbations are one of the most common causes of hospital admissions and hospitalization in childhood. There are limited studies about the triggering factors in children with asthma exacerbations. The aim of this study was to investigate the factors triggering asthma exacerbations in childhood.
Method: The patients who were admitted to the emergency and allergy outpatient clinics with an acute asthma exacerbation between the ages of 2 and 18 years were examined. Sociodemographic characteristics of the patients, home conditions, pre-attack conditions and treatment-follow-up compliance were questioned. The severity of the attack, laboratory data and vital signs were recorded.
Results: A total of 211 patients were evaluated. 132 (62.6%) of the patients were male. Of the patients, 149 (70.6%) had respiratory tract infection as a possible triggering factor and the most common factor in all groups according to age, season and sex. When the other triggers were examined, 55 of the patients were exposed to an irritant (26%), 142 to smoking (67.2%), 50 (23.6%) to inhalant allergens and 30 (14.2%) to stressful events before the exacerbation and defined these factors as possible triggers. In our study, it was observed that the frequency of respiratory tract infection as a possible trigger was higher in moderate/severe attacks (*P*: 0.030) and allergen exposure as possible trigger was more frequent in mild exacerbations (*P*: 0.041). Allergen exposure as possible trigger was reported to be more frequent in patients who did not regularly use asthma medications (*P*: 0.030) and in patients attending school (*P*: 0.021).

Conclusion: Children with asthma must be closely followed and every effort should be taken to prevent triggering factors, especially infections.

LBTP1906 | Allergic and non-allergic comorbidities in pediatric atopic dermatitis

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Background: Atopic dermatitis, chronic or recurrent inflammatory skin disease, has increased over the past half century. The etiopathogenesis of AD is complex and multifactorial, with genetic predisposition, skin barrier dysfunction, altered immune responses, and environmental and lifestyle factors, being suspected as the underlying and aggravating factors. Disease onset predominately occurs in childhood and it is well known the relationships between atopic dermatitis and atopic disorders such as food allergies, allergic asthma, and non-atopic comorbidities.

Method: The objective of this study was to underline the frequency and the impact of allergic and nonallergic comorbidities on the outcome and on the evolution of the disease, as well as those related complications may affect the quality of life in early age. We performed a retrospective study on 102 infants admitted in II Pediatric Clinic, between January 2017 and December 2017 with diagnosis of atopic dermatitis.

Results: The average age of studied patients was 3 years. The immunogram carried out shows the association of the immune deficit (primary or transitory) in 38% cases. The associated comorbidities was represented by infections (35 cases), gastrointestinal disturbances (15 cases), allergic disease (bronchial asthma and allergic rhinosinusitis—10 cases) and 1 case with neurologic impairment. In the relationship with atopic dermatitis, some of these comorbidities have led to the aggravation of symptomatology (associated with failure to comply with the doctor's recommendation treatment and in avoiding the risk factors), and others have been a side effect of the dermatitis itself or of the treatment (respiratory, metabolic or digestive dysfunctions).

Conclusion: The atopic dermatitis associated comorbidities emphasize the burden of this disease in pediatric patients. Even the mechanisms of associated comorbidity are not yet fully understood, both atopic dermatitis itself as well as the treatment and the lifestyle factors may contribute to their genesis and outcome.

LBTP1907 | Quality of life in children aged 8-18 with a diagnosis of confirmed drug hypersensitivity reaction

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Background: A significant increasing tendency has been observed in the incidence of drug hypersensitivity reactions in children. These reactions may affect the quality of life (QOL) of the patients. Studies investigating the effects of drug hypersensitivity reactions on QOL in children are limited. In our study, we aimed to evaluate the QOL and the factors affecting quality of life in children with a diagnosis of confirmed drug hypersensitivity. We also investigated the applicability of validated Turkish version of the drug-specific quality-of-life scale for adults for the children.

Method: Our study is conducted among the children aged between 8 and 18 who had confirmed drug hypersensitivity and healthy control group. Sociodemographic characteristics of patients and families, drug(s) causing the reaction, characteristics of reaction and diagnostic tests used to confirm drug hypersensitivity reaction were recorded. The Child Quality of Life Scale (PedsQL) parent and self-report forms, Drug Hypersensitivity Specific Quality of Life Questionnaire (DrHy-Q) patient form was used for quality of life evaluations.

The PedsQL findings of the patient group were compared with those of the healthy age group.

Results: The study is conducted on 46 patients (%63, 29 female). The mean age was 157.07 ± 33.87 months (min. 96, max. 216). Twenty-two (47.8%) patients had reaction with antibiotics, 21 (45.7%) with nonsteroidal anti-inflammatory drugs. The reactions were as follows: angioedema in 16 (34.8%) patients, maculopapular rash in 8 patients (17.4%), severe cutaneous drug reaction in 6 (13%) patients and anaphylaxis in 5 (10.9%) patients. There was no statistically significant difference between the patients and the control group's PedsQL scores that was filled by themselves and their parents ($P > 0.05$). There was a negative correlation between PedsQL and DrHy-Q ($r = -0, 54$ $P = 0.00$) thus we concluded that Turkish version of DrHy-Q that was validated for adults can be used for children aged 8-18 years.

Conclusion: There were no differences in regard of QOL between patients and control group. It was shown that the DrHy-Q developed for adults can be used in children.

LBTP1908 | Evaluation of underlying etiological factors in children with high serum immunoglobulin E levels

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Background: Immunoglobulin E (IgE) is an antibody that plays an important role in allergy and immunological defense against parasitic infections. Serum IgE level is mostly used in predicting both allergic and some immunological diseases.

Method: The aim of the study was to evaluate the etiological factors leading high serum IgE levels in children and to determine the optimal cut-off values for serum IgE levels in different etiologic factors. Children with serum IgE levels above 95th percentile that were followed-up between 2015 and 2016 were enrolled in the study. Data of the patients, including clinical characteristics, laboratory parameters, atopy, and diagnosis, were collected and analyzed.

Results: A total of 337 children (M/F: 222/115) with a median age of 8.2 (3.8-11.6) years was included in the study. Allergic diseases consisted of asthma, allergic rhinitis, atopic dermatitis, food and venom allergy occurred in 90.7% of the study population. Out of 337 patients, 4.8% had primary immunodeficiencies (PID), 2.7% had chronic lung diseases, and 1.8% had rheumatological diseases. Remarkably, serum IgE levels of the patients with PID [IQR: 793 (256-9892)] were significantly higher than the patients with the diagnosis of other disorders as well as allergic diseases [IQR: 441 (281-931)] (P = 0.041). Total serum IgE level >2500 IU/L was the optimal cutoff value [area under the curve (AUC) of 0.651 (P = 0.041)] in predicting PID with a sensitivity of 43.8% and a specificity of 94.1% (negative predictive value 97.1% positive predictive value 26.9%).

Conclusion: Allergic diseases constitute a large proportion of the children presenting with high serum IgE levels. Moreover, IgE levels below 2500 IU/L considerably excludes the diagnosis of PID.

LBTP1909 | Seeking early-life windows of opportunity to shape lifelong immune health through text mining

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Background: The first 1000 days of life is a period of growth and development in which the foundations of lifelong immune homeostasis are established. Unfortunately information on mechanisms involved in immune health in early life is scattered across thousands of scientific papers. We used INDRA (Integrated Network and Dynamical Reasoning Assembler), an automated software infrastructure that uses text mining and machine learning tools, to extract and structure information on causal mechanisms to generate early life immune-networks that help to identify sensitive periods for early immune priming for life.

Method: First an inventory of available literature (till July 2018) regarding 6 immune developmental periods (1st/2nd/3rd trimester of gestation, birth, newborn (0-28 days), infant (1-24 months)) in human and experimental animals was made using Scopus and PubMed. Articles were screened on title, abstract and full text to select relevant articles which were subsequently classified into the appropriate early life time-periods. Next the INDRA text mining platform rendered the full texts computationally accessible, identified relevant entities (e.g. genes/proteins/metabolites/processes/diseases) and extracted relationships between these entities. Next INDRA assembled all relationships into causal early life-immune networks each covering a different early life period.

Results: In total 2966 articles were selected using the literature databases of which 829 articles (451 original manuscripts, 378 reviews) were considered relevant after screening. This resulted in 249, 296, 344, 252, 287, and 215 articles classified into resp. the 1st, 2nd, 3rd trimester, birth, newborn and infant period (some articles covered multiple periods). From these full text articles, INDRA extracted resp. 2101, 3234, 3654, 1568, 2917 and 1487 unique relationships between entities, resulting in 6 large causal early-life immune networks each covering a different early life period.

Conclusion: For the first time, we extracted and structured relevant information from thousands of early-life papers to understand causal relationships of between genes, proteins and processes on immune health in different early-life periods by combining the text mining/machine learning tool INDRA with our immune domain knowledge. The resulting early-life immune networks generate knowledge on the dynamics of early life immune health development which opens opportunities for interventions to improve early life immune health.

LBTP1910 | A mixed methods investigation into a new Clinical Psychology service in Children's Allergy

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Background: The Children's Allergy Clinical Psychology service at The Evelina London Children's Hospital provides services to children, young people and their families. This study investigates the impact of the psychology service and explores how parents experience

Patient	Pre therapy goal ratings	Post therapy goal ratings	Average pre therapy rating	Average post therapy rating
1	5, 5, 5	10, 10, 10	5.0	10.0
2	4, 3, 1	9, 10, 9	2.7	9.3
3	4, 5, 4	6, 6, 5	4.3	5.6
4	5, 3, 3	9, 8, 8	3.7	8.3
5	5, 5, 4	10, 10, 10	4.7	10.0
6	2, 0, 5	10, 8, 10	2.3	9.3
7	5, 5, 5	10, 9, 9	5.0	9.3
8	5, 5, 5	10, 10, 10	5.0	10.0
9	4, 5, 1	10, 10, 10	3.3	10.0
10	4, 5, 4	6, 6, 5	4.3	5.6

the stepped care allergy psychology service, so as to inform future service development.

Method: A two phase mixed method quantitative and qualitative study. Phase 1: Quantitative sociodemographic and service data were collected from the establishment of the service in 2016 until 2018. Phase 2: A semi structured questionnaire was designed to gather parents' perspectives of the stepped care allergy psychology service. The questionnaire included open and closed questions about the different types of psychological intervention from referral to discharge.

Results: Phase 1: 254 patients were referred to the service from 2016-2018. These children ranged between 1 and 18 years, with the mean age 9.1 years. Of those who took up the service, patients were contacted within an average of 78.5 days. The mode of initial contact varied between phone, face to face and workshop. Average confidence ratings for subjective therapy goals before and after individual therapy and workshop interventions were both statistically significant at $P > 0.005$ level.

Phase 2: 36 parents were contacted by phone. The main reasons for psychology intervention were reported by parents to be for child anxiety and feeding difficulties. The majority parents reported that both therapies relieved anxiety and improved quality of life. All parents asked had a positive opinion of psychology in paediatric allergy with it being described as "important", "useful" and "essential". Negative aspects of the experience reflected the realities of service driven constraints including long waiting times, lack of provision for older children transitioning to adult services and availability of different appointment times.

Conclusion: Service user feedback is imperative to providing a high standard of care. This study highlighted positive experiences of a stepped care service and indicated areas for future improvement that we are attempting to address. Waiting times decreased and number of clinics increased with continued growth of the service showing increased provision of psychology helps to address negative aspects of parental reported experiences.

LBTP1911 | Seasonal variations in adverse reactions during pollen subcutaneous immunotherapy in children

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Background: Allergen immunotherapy induces immune tolerance by the usage of increased doses of responsible allergen and is an effective treatment strategy for allergic rhinitis. However, adverse reactions are important problems in subcutaneous immunotherapy (SCIT).

Method: We aimed to evaluate the risk factors for the reactions developing during pollen SCIT in a pediatric population. The data obtained from medical files of the children who had taken pollen SCIT between 2000 and 2018, retrospectively. Patients with local (LR), large local (LLR), systemic reactions (SR), and without any reactions were compared with respect to clinical and laboratory parameters. In addition, patients were analyzed for the predictors of large local and systemic reactions during pollen IT.

Results: A total of 261 patients (M/F:177/84) with a mean age of 12.0 (±3.0) years old were included in the study. Concomitant asthma and family history of atopy were present in 132 (50.1%) and 67 (25.7%) of the patients. Of 261 patients, LR, LLR, and SR occurred in 41.8%, 11.5%, and 13.4% of the cases, respectively. Although total number of injections resulting in LR were more frequent in the build-up phase (5.6% vs 2.0%, $P < 0.001$), the difference was not significant for LLR and SR. Moreover, injections resulting in LR and SR were significantly observed in pollen season ($P < 0.001$ and $P = 0.003$, respectively). Patients experiencing LLR and/or SR were frequently initiated SCIT in pollen season ($P = 0.016$) and had much more LR during SCIT ($P < 0.001$) compared to the children without LLR and/or SR. Risk analysis for the presence of LLR and/or SR during SCIT revealed the initiation of pollen SCIT in pollen season [OR:7.351, 95%CI:1.532-35.279, $P = 0.013$] and the presence of LR during

pollen SCIT [OR:4.214, 95%CI:2.159-8.224, $P < 0.001$] as independent risk factors.

Conclusion: Children underwent pollen SCIT experienced SR frequently both in pollen season and during build up period. Initiation of pollen SCIT in pollen season was found to be an independent risk factor for LLR/SR during SCIT. Choosing to start pollen SCIT out of the pollen season can reduce serious adverse reactions observed during SCIT.

LBTP1912 | Preschool wheezing and asthma in children: Systematic review of guidelines and quality appraisal with the Agree II Instrument

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Background: Wheezing, especially in preschool children, is a common time and resources consuming problem, that also poses a diagnostic challenge. In order to address this issue, an EAACI Task Force on Clinical Practice Recommendations on preschool wheeze was established. As a first step in developing guidelines for preschool wheeze, we aimed to perform a systematic review of existing guidelines on both, wheezing and asthma, with appraisal of their quality.

Method: The Cochrane Library, MEDLINE, and EMBASE databases were searched systematically in April 2017 in order to identify guidelines for diagnosis and management of wheezing and asthma in children. The methodological rigor, quality, and transparency of relevant guidelines were assessed by at least four independent researchers, with the use of the Appraisal of Guidelines for Research and Evaluation (AGREE II) tool.

Results: Of 24 included guidelines 5 achieved the highest scores (>90%), and 3 of which were developed by recognized scientific organizations. Further eight guidelines, were considered to be of high quality (i.e. overall quality scores >60%). The quality scores for each domain varied. Of all domains, clarity and presentation had the highest mean score, and applicability and stakeholder involvement had the lowest mean score. The scores (mean ± SD) for individual domains were as follows: domain 1 (score and purpose) 80 ± 17%; domain 2 (stakeholder involvement) 52 ± 24%; domain 3 (rigor of development) 55 ± 26%; domain 4 (clarity of presentation) 81 ± 17%; domain 5 (applicability) 52 ± 29%; and domain 6 (editorial independence) 59 ± 28%. Maximum possible overall score was 97%.

Conclusion: A number of guidelines on wheezing and asthma management in children are available; however, their quality varies vastly. Overall, the guidelines developed by recognized professional/scientific organizations were of the highest quality and these guidelines should be recommended for use. It is important that future guidelines for wheezy preschoolers aim to identify individuals who suffer from asthma, since its management is appropriately guided.

TUESDAY, 4 JUNE 2019
LB TPS 07
MANAGEMENT OF RESPIRATORY DISEASE

LBTP1917 | Forced oscillation technique as useful method to monitor the efficacy of mepolizumab in treating severe eosinophilic asthma

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Background: Severe eosinophilic asthma (SEA) patients with recurrent exacerbations, despite maximal ICS/LABA dose, are eligible for treatment with the anti-Interleukin (IL)-5 monoclonal antibody mepolizumab (MPZ) (1). During MPZ treatment, while symptoms and peripheral blood eosinophil counts (PBE) tend to reduce, changes in lung function parameters (LFP) assessed by spirometry are minimal (2). The forced oscillation technique (FOT) is a non-invasive test that measures within-breath impedance (WBI) of peripheral airways using sound waves at selected frequencies during tidal breathing. FOT was useful in monitoring severe asthma patients and, in one case, documented the efficacy of omalizumab in reducing peripheral airways impedance (3-5). The aim of our study was to assess whether FOT is able to monitor the changes in peripheral lung mechanics induced by MPZ (6), and if such changes correlate with clinical, laboratory and lung function tests results.

Method: We conducted a prospective study on 18 patients with severe eosinophilic asthma, scheduled to receive MPZ (Table 1). The following parameters were assessed at baseline (BL) and then at 1, 3 and 6 months of treatment: asthma control test (ACT); PBE (/mmc-%); LFP parameters FEV1, FVC (L-%), and FEV1/FVC (%) assessed by spirometry (Vmax™, Carefusion); WBI parameters expiratory 5 Hz resistance (R5exp), reactance (X5exp) and full-breath % of predicted (R5%, X5%) [7] assessed by FOT (Resmon PRO Full, Restech SRL).

Results: Significant improvement of ACT scores ($P < 0.001$), FEV1-FEV1% ($P = 0.004$), FVC-FVC% ($P = 0.012$) and significant reduction of PBE ($P < 0.005$) were observed from month 1 of MPZ therapy. While ACT scores improved over time, LFP and PBE parameters showed no further improvement at month 3 and 6. Statistically significant changes were observed in WBI parameters: X5% ($P = 0.02$) reduced from month 1, and X5exp ($P = 0.04$), R5exp ($P = 0.02$) and R5% ($P = 0.003$) from month 3. Changes in ACT scores correlated with changes in X5exp ($r = .660$, $P = 0.007$), FVC% ($r = .600$, $P = 0.030$), but not R5exp ($P = 0.054$), FVC, nor FEV1-FEV1% ($P > 0.05$). Changes in PBE correlated with changes in X5exp, R5exp ($r = .700$, $P = 0.036$), FEV1 ($r = .762$, $P = 0.028$) and FEV1% ($r = .738$, $P = 0.037$), respectively. The few non-responders to MPZ (3/18), despite the reduction in PBE compared to BL, did not show changes in WBI during treatment.

Conclusion: FOT could become a valuable tool to monitor the efficacy of MPZ treatment in SEA patients, whose changes showed to correlate with both ACT scores and PBE.

		Subjects (n = 18)
Demographic data	*Sex*	
	Female	11 (61.1%)
	Male	9 (38.9%)
	Age	54.5 (9.1)
	BMI	24.9 (4.1)
Clinical history and use of medications at baseline	Former smoker	10 (55.6%)
	Duration of asthma	19.1 (9.5)
	Current use of OCS	13 (72.2%)
	Equivalent PDN use (mg/day)	5.0 (5.7)
	OCS use	
	Chronic	8 (44.4%)
	On-demand	10 (55.6%)
	Current ICS use	18 (100%)
	Current LABA use	18 (100%)
	Current LAMA use	4 (22.2%)
	Current LRA use	6 (33.3%)
	Previous treatment with OMZ	6 (33.3%)
	Previous treatment with TP	2 (11.1%)
Clinical features at baseline	ACT	16.3 (3.7)
	Eosinophils (/mmc)	659.4 (300.9)
	Eosinophils (%)	7.9 (4.5)
	FVC (L)	3.29 (0.9)
	% of predicted FVC	89.2 (15.3)
	FEV1 (L)	1.9 (0.6)
	% of predicted FEV1	70.2 (20.1)
	FEV1/FVC	58.8 (12.1)
	R5exp ($cmH_2O/L/s$)	5.0 (1.7)
	% of predicted R5	159.8 (53.4)
	X5exp ($cmH_2O/L/s$)	-2.4 (1.6)
	% of predicted X5	174.1 (92.4)

Data expressed as mean (SD) or n (%).

Abbreviations: ACT, asthma control test; BMI, body mass index; FEV1, forced expiratory volume in 1 second; FVC, forced vital capacity; ICS, inhaled corticosteroids; LABA, long-acting beta-2

agonist; LAMA, long-acting muscarinic agonist; LRA, leukotriene receptor antagonist; OCS, oral corticosteroids; OMZ, omalizumab; PDN, prednisone; R5exp, expiratory resistance at 5 Hz; TP, thermoplasty; X5exp, expiratory reactance at 5 Hz.

LBTP1920 | Salbutamol and ipratropium bromide are high risk factors for atrial arrhythmias in patients with COPD and CVS diseases

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Background: Salbutamol being a beta-adrenergic stimulator may increase heart rate and the potential for cardiac arrhythmias in already compromised circulatory system of a CVS ailment patient. Ipratropium bromide, on other hand is non-selective muscarinic antagonist, which means the acetylcholine (ACh) released by these fibers binds to muscarinic receptors in the cardiac muscle, especially at the SA and AV nodes that have a large amount of vagal innervation and ACh released by vagus nerve binds to M_2 muscarinic receptors, a subclass of cholinergic receptors which produces negative chronotropy and dromotropy in the heart, as well as negative inotropy and lusitropy in the atria (the negative inotropic and lusitropic effects of vagal stimulation are relatively weak in the ventricles) now will behave the other way because of antagonist effects of ipratropium bromide.

Method: The effect of above mentioned drugs was evaluated in patients with COPD and CVS ailments in 2 groups of same age and equal sex distribution. Age bar of being 65-70 years. In this study, ECGs were evaluated before and after the usage of salbutamol and ipratropium bromide. Patients were evaluated before and after 4 weeks of treatment with above mentioned drugs: 1) salbutamol, 90 mcg (1 puff) every 4 hours 2) Ipratropium Bromide, 34 mcg (2 puffs) every 6 hours. The series of ECGs were performed pre-treatment and at Week 4th. We were able to find various arrhythmias such as atrial tachycardia, atrial fibrillation and ventricular tachycardia. There were 60 ECGs recordings in 30 treated patients (M = F). In total, Out of 30 patients, we could see ECG changes in 28 patients. The most common met ECG was with Atrial Tachycardia in 20 patients out of which 12 were females (60%) and 8 were males (40%). The least seen was atrial fibrillation in only one male patient. The ventricular tachycardia was seen in 6 males and 1 female patient.

Results: The percentage of patients with atrial tachycardia, post usage of the drugs mentioned was significantly higher with 71.4%, which is way higher than other types of arrhythmias occurred 3.57%(AF), 25%(VT) respectively. All treatment groups consistent monitoring and were under supervision.

Conclusion: In conclusion, in this study of COPD and CVS ailment patients with no other comorbidities, a high percentage of patients were observed to have atrial tachycardia before after the treatment. More serious arrhythmias were infrequent but were observed and noted.

LBTP1921 | Salbutamol and ipratropium bromide are risk factors for arrhythmias in patients with CVS diseases

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Background: A finding was noted that patients who were admitted with diagnosis of COPD and were known case of any CVS pathology treated with salbutamol and ipratropium bromide are at risk of developing arrhythmias. The patient who has COPD with a heart ailment has CVS which is already compromised with a disease and a respiratory component is also present in addition to it, worsening the scenario. Despite of the best modalities of diagnosis and treatment available, a treatment trend is followed as treating an exacerbation of COPD patient with or without CVS pathology with salbutamol and ipratropium bromide.

Method: The design was a case control study in 40 adult patients who presented with exacerbation of COPD out of which 20 were males and 20 were females of mean age group of 55 years. Out of them 10 male and 10 female patients were known cases of different CVS ailments and others were not. Patients in Group A was numbered from 1 to 20 and Group B was numbered from 21 to 40. Letter "m" was used for male patients and letter "f" was used for female patients. Patients were taking the SABA, Ipratropium bromide and ICS on, on and off basis for past 3-4 years as their treatment for COPD. And history was taken for any arrhythmias or ECG changes. This is how case and control were taken and ODD's ratio was calculated.

Results: The positive ODD's Ratio of 10.23, and considering the vitals monitored during the treatment as well, it simply explains the fact that salbutamol and ipratropium bromide has the potential to aggravate and cause arrhythmias in patients with CVS ailments.

Conclusion: The patients with COPD forehand are prone to arrhythmias because of electropathy hypothesis and underline autonomic neuropathy as the most possible mechanism of arrhythmias in hypoxemic, non-respiratory failure, and COPD patients. Hence, in adult patients with CVS pathologies, Beta 2-adrenergic receptors agonist and anticholinergic drug cause significant arrhythmias. Treating patients with Beta 2-adrenergic receptors agonist and anticholinergic drug can be pharmacologically aggravating the risk of development arrhythmias in already CVS and respiratory compromised patients and should be avoided or given with lots of caution and under strict monitoring.

LBTP1922 | Occupational asthma in patients exposed to Persulfate Salts. A 3 years experience (2016-2018) in an allergy department

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Background: According to the European Community Respiratory Health Survey, 10-25 percent of adult onset asthma is due to Occupational asthma (OA). Persulfate salts (PS) are low-molecular-weight chemicals, and the most important OA agents in hairdressers. Our aim is to study the basal conditions and the characteristics of the patients diagnosed with asthma induced by PS in our department.

Method: We established a descriptive study about the asthma characteristics in all patients referred to our service between January 2016 and December 2018, selecting those cases in which PS was the cause of their disease.

Results: 10 female hairdressers (mean age, 39 years; range, 26-52 years) were included. 5 were ex-smokers, 2 were active smokers, 2 were non-smokers. 3 patients had a previous diagnosis of asthma and rhinitis. Regarding the previous aeroallergen sensitizations: 50% of patients were sensitized to common inhalants. The mean occupational exposure was 221.3 months and 59.13 months for symptoms until they were sent to our department. Regarding the characteristics of the disease: 8 patients showed rhinitis, 8 dyspnea, 7 cough and 4 wheezing. The mean FeNO was 29.5 ppb. In 9 patients, the methacholine bronchial provocation test was positive (mean PC20 3.07 mg/mL). Bronchial provocation specific with PS was positive in the 10 patients, with a mean decrease of 19.28% in FEV1. The average time of sick leave during the study was 5.7 months.

Conclusion: We found a high prevalence of smokers (7/10 patients) and sensitization to aeroallergens; in the future, this possible association with PS OA should be studied. In addition, we find that is a great cause of concern the long period of exposure to PS and the onset of asthma symptoms before they are referred to a specialist. In our opinion, hairdressers should be studied in an allergy department before starting their jobs in order to check their basal pulmonary function and if they develop asthma symptoms or worsening in established ones the diagnosis and treatment could be established earlier.

LBTP1923 | Occupational asthma and rhinitis due to formaldehyde

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Background: Formaldehyde is a low molecular weight chemical that combined with a human protein is able to produce a sensitizing neoantigen. Formalin is a formaldehyde solution in water from 37% to 50% by volume. Cosmetics and personal care products that may contain formaldehyde include nail polishes, makeup, body washes, deodorants, shampoos or hair straightening products (also known as hair relaxers). It is also use as a sterilizing in the health care industry. The aim of our study is to describe five patients in which formaldehyde induced nasal or bronchial response.

Method: Case series of rhinitis and/or occupational asthma due to exposure to formaldehyde at Fundación Jiménez Díaz University Hospital, from 2005 to 2019, were evaluated. We perform the following tests: Patch tests with formaldehyde, FeNO, spirometry, methacholine challenge testing, specific bronchial challenge (SIC) with formaldehyde, monitored by spirometry and/or acoustic rhinometry (ARM).

Results: A total of 207 SICs were performed in our department between 2005 and 2019. 131 SICs had a positive result for asthma. 6 SICs corresponded to exposure to formaldehyde. The patients were four women and two men. The mean age was 48 years (34-58 years) There was only one case with positive formaldehyde patch tests.

After SIC, FEV1 showed a fall of 20% or more and in three cases. Only one patient had a positive nasal provocation test assessed by using ARM. A significant change in pc20 methacholine value was observed in the other two patients. No changes were observed in post challenge FeNO values.

Conclusion: To our knowledge this is one of the few reports of occupational asthma due to formaldehyde and the first case of occupational rhinitis assessed by ARM. This results enforce the idea of suspecting formaldehyde as a compound able to cause occupational respiratory diseases.

LBTP1924 | Atopic status and exercise-induced bronchoconstriction in high-school elite athletes

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Background: Physical exercise, though absolutely beneficial for human well-being, is a well-known trigger to induce bronchoconstriction. Exercise-induced bronchoconstriction (EIB) is defined as transient, reversible airway narrowing occurring during or after exercise and is common among elite athletes. Atopy is considered to be a risk factor for EIB. The purpose of this study is to investigate the atopic status of young elite athletes.

Method: High-school selected elite football players (12-18 years) (n = 66) performing at least 12 hours of sport per week (median = 15 hours) were recruited. Atopy was defined by a skin prick test (SPT) against 9 common allergens. Subjects were considered to be atopic if they had at least one positive SPT result. The eucapnic voluntary hyperventilation (EVH) test was performed according to ATS guidelines and adapted for this young age group (n = 57). The fractional exhaled NO (FeNO) levels were measured at baseline in a subgroup of elite football players (14-18 years, n = 18).

Results: A total of 23 football players were atopic (35%) of which 8 were poly-sensitized. The most common observed positive allergens in these football players were house dust mite (n = 16), followed by grass pollen (n = 11). FeNO levels were significantly higher in atopic athletes (median: 21.5 ppb, P25-P75: 18.3-37.8 ppb, n = 6) compared to non-atopic athletes (median: 10.5 ppb, P25-P75: 5.3-14.5 ppb, n = 12) (P = 0.0291). Moreover, athletes with FeNO levels higher than 18 ppb have a significantly higher risk to be atopic, with a sensitivity of 83.3% and specificity of 83.3% (P = 0.0312). Seven athletes were considered to be EIB positive (12%), including 3 atopic athletes. In contrast, football players self-reported shortness of breath (35%, n = 23) and/or wheezing (18%, n = 12) during exercise.

Conclusion: 35% of the young elite athletes demonstrates atopy, which is slightly higher than in the general population in Europe (15-20%). Atopic elite athletes have higher FeNO levels compared to non-atopic elite athletes. Accordingly, FeNO levels may be a useful indicator of atopic phenotypes among young elite athletes, using a cut-off value of 18 ppb. Despite atopy is a risk factor for the development of EIB in athletes, we could not find a correlation between atopy and the occurrence of EIB due to the low number of EIB positive elite athletes. Consequently, also young elite athletes of other sport disciplines need to be included.

LBTP1925 | Diagnosis of occupational respiratory allergic diseases in bakers and their exposition to flour powders

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Background: Exposure to flour powders and sensitization to mites play an important role in the development of bakers' respiratory disorders. The aim of this study was to evaluate the correlation between occupational exposure to flours and prevalence of respiratory signs, symptoms and inflammation biomarkers among bakers.

Method: A surveillance program was performed in 26 industrial and artisan bakeries in North-Eastern Italy, and 142 volunteer workers were recruited. We evaluated Skin Prick Tests (SPT) for the most common airborne, flours and storage mites allergens, spirometry, FeNO and Peak Nasal Inspiratory Flow (PNIF). A self-report symptom evaluation questionnaire (Sinonasal Outcome Test 22, SNOT-22) and a VAS for nasal symptoms were also administered. In select cases were collected personal samples of flour dust during the working hours and analysed with a gravimetric determination. The flour dust cumulative exposure was also calculated.

Results: We sampled 142 workers (99 men and 43 women, age 40 ± 13 years, length of service 14 ± 12 year), 60 (42%) of whom were active smokers; fourteen subjects (10%) reported upper respiratory symptoms, whilst 10 (7%) had lower respiratory symptoms. Atopy was present in 78 workers (56%); furthermore 59 of them (42%) were skin positive to at least one occupational allergen.

Abnormal findings were detected in 14% of spirometry and 24.5% of FeNO. The range of flour exposures was 0.097-14.005 mg/m^3.

At univariate logistic analysis, length of service was associated to a higher grade of sensitization to flours (OR = 4.50; 95%CI: 1.08; 18.69). Following the literature, a multiple regression model has been fitted on the square root of PNIF values with a forward stepwise selection of the variables (multiple R^2 = 30%). Given the positive effects of male sex, VAS for obstruction and hyposmia, and the negative effects of FeNO, VAS for headache and odour identification, we observed a significant negative effect of the prick test (regression coefficient = −0.88, P = 0.009) and an almost significant positive effect of rye and soy sensitization (regression coefficient = 0.83 and 1.14 respectively, P = 0.09).

Conclusion: Although many workers reported low prevalence of respiratory symptoms, we frequently found signs of upper and lower airways inflammation. It was also shown that occupational factors such as flour sensitization may affect nasal patency, considered as forced inspiratory flows. Further studies and on a bigger population are needed to confirm and better unfold these results.

LBTP1927 | Using an electronic nose to monitor airway dysfunction in elite swimmers: A pilot study

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Background: Endurance swimming exercises coupled to disinfection by-products exposure has been associated with increased airways dysfunction in swimmers, which is often referred as a precursor change leading to "swimmers' asthma". However, without continuously monitoring lung function parameters, it is challenging to understand the extent of the airway dysfunction associated with swimming practice. The electronic nose technology has been shown capable of identifying asthma-associated volatile organic compounds (VOC) in the exhaled breath. Therefore, this study aimed to

investigate if an electronic nose system is able to identify the airway dysfunction traces associated with swimming practice.

Method: A total of 10 elite swimmers (13-15 years old) and 15 elite football players (15-17 years old) participated in this pilot cross-sectional study. An asthma diagnosis was ruled out by a specialist, according to standardized guidelines. Participants performed spirometry with bronchodilation and exhaled nitric oxide measurements. Exhaled breath was collected through a 1 L Tedlar bag. The exhaled breath VOC were then measured through an electronic nose system with 32 nanocomposite sensors. Mann-Whitney tests were used to compare continuous variables between groups, and principal component analysis was performed to create discriminant factors from the measured VOC profiles. Finally, generalized linear models were performed to estimate how the VOC factors were associated with FEV_1 reversibility after bronchodilation.

Results: As expected, FEV_1 reversibility in swimmers was significantly higher than in football players ($P = 0.007$, Table 1). The factorial analysis of the participants' exhaled VOC was able to correctly discriminate 100% of the swimmers and 87% of the football players using a single factor ($P < 0.001$). Through linear modelling, the participants' FEV_1 reversibility was shown to influence the aforementioned component with a β value of 0.018 (CI 95% = 0.004 : 0.032, $P < 0.013$), even when adjusted for age, sex, body mass index, atopy and the type of sport. The whole model was significant at a P value <0.001.

Conclusion: These results show that, not only elite swimmers airways are more sensitive to β-agonists, but they also exhale configurations of VOC that are more associated with bronchodilator response than those from football players. A longitudinal study would be needed to further confirm and validate these results.

	Swimmers	Football players	*P*
n (males)	10 (2)	15 (15)	**<0.001**
Age (years)	14 (13 : 15)	16 (15 : 17)	**0.008**
BMI	20.6 (19.0 : 22.2)	20.8 (20.0 : 22.0)	0.657
FeNO (ppb)	14.0 (11.7 : 19.0)	21.0 (12.3 : 29.3)	0.165
Baseline FEV1 (L)	4.16 (3.06 : 4.56)	4.15 (1.85 : 4.34)	0.760
Chg from pred. FEV1 (%)	134.0 (128.2 : 155.7)	138.2 (124.4 : 146.3)	0.723
Post BD FEV1 (L)	4.47 (3.27 : 4.76)	4.26 (3.81 : 4.52)	0.934
Baseline FVC (L)	4.76 (3.75 : 5.13)	4.57 (4.22: 4.91)	0.967
PEF (L/min)	7.47 (6.51 : 8.99)	7.24 (3.28 : 8.18)	0.890
FEV1 reversibility (L)	0.24 (0.21 : 0.26)	0.16 (-0.10 : 0.22)	**0.008**
FEV1 reversibility (%)	6.65 (5.33 : 7.85)	3.49 (-2.62 : 5.71)	**0.007**

LBTP1929 | "Blockers" can benefit from 300IR house dust mite tablet—results of a large multicentre clinical trial in house dust mite induced allergic rhinitis patients

Demoly P[1,2]; Creticos P[3]; De Blay F[4]; Gevaert P[5]; Kowal K[6]; Le Gall M[7]; Nenasheva N[8]; Passalacqua G[9]; Pfaar O[10]; Tortajada-Girbés M[11]; Vidal C[12]; Casale T[13]; Corren J[14]

[1]Department of Pulmonology and Addictology, Arnaud de Villeneuve Hospital, Montpellier University, Montpellier, France; [2]Sorbonne Universités, UPMC Paris 06, UMR-S 1136 INSERM, IPLESP, Equipe EPAR, Paris, France; [3]Creticos Research Group, LLC in association with Charleston Allergy & Asthma, Charleston, United States; [4]Allergy Division, Chest Diseases Department, Strasbourg University Hospital, SC, France; [5]Upper Airways Research Laboratory, Strasbourg, Belgium; [6]Department of Experimental Allergology and Immunology, Medical University of Bialystok, Ghent, Poland; [7]Stallergenes Greer, Global Clinical Development, Bialystok, France; [8]Russian Medical Academy of Continuous Professional Education of the Ministry of Health of the Russian Federation, Antony, Russia; [9]Allergy and Respiratory Disease, University of Genoa, Moscow, Italy; [10]Department of Otorhinolaryngology, Head and Neck Surgery, Section of Rhinology and Allergy, University Hospital Marburg, Genoa, Germany; [11]Pediatric Pulmonology and Allergy Unit, Dr. Peset University Hospital, Marburg, Spain; [12]Allergy Department, Complejo Hospitalario Universitario de Santiago, University of Santiago de Compostela, Valencia, Spain; [13]Division of Allergy and Immunology, University of South Florida, Santiago De Compostela, United States; [14]Departments of Medicine and Pediatrics, David Geffen School of Medicine at the University of California, Tampa, United States

Background: Nasal congestion (or blocked nose) is one of the most prominent and troublesome symptoms for patients with house dust mite (HDM) allergic rhinitis (AR) and is strongly associated with a deteriorated quality of life, with negative impact on daytime functioning, sleep, and a significant decrease in daytime productivity. Therefore, in a large European and North American clinical trial, we aimed to evaluate how 300 index of reactivity (IR) HDM sublingual tablet relieves nasal congestion.

Method: In this Phase III study, adults and adolescents (aged 12-65 years) with HDM AR were randomly assigned to 12 months of daily treatment with either 300IR HDM sublingual tablet (Stallergenes Greer, Antony, France) or placebo. Patients were provided with an e-diary and instructed to score their four allergic rhinitis symptoms (i.e. itchy nose, sneezing, runny nose, blocked nose) on a scale ranging from 0 (absent) to 3 (severe) and were allowed to take rescue medication as required. As a secondary outcome evaluation, an ANCOVA was performed on the full analysis set to assess differences in the individual symptom scores between the 300IR and placebo groups during the primary evaluation period. Chi-Square test was used to compare use of rescue medication between the two groups during the same period.

Results: A total of 1262 patients (300IR n = 586; Placebo n = 676) completed their rhinitis symptom scores during the primary evaluation period. More patients used rescue medication in the placebo group (62.4% vs 55.8%; $P = 0.0169$). The Least Square (LS) mean for the blocked nose symptom score was significantly lower in the 300IR group vs placebo (300IR: 0.85; Placebo: 1.04; Least square mean difference = −0.19; $P < 0.0001$). This corresponded to a relative LS

Mean difference of −18.3% in favour of the 300IR group. LS means for the other 3 nasal symptom scores were also significantly lower in the 300IR group vs placebo ($P \leq 0.0004$), indicating a better overall nasal symptom improvement in the 300 IR group than in the placebo group.

Conclusion: AIT with 300IR HDM sublingual tablet among adults and adolescents with HDM AR significantly improved nasal symptoms compared to patients receiving placebo despite a higher consumption of rescue medication in the latter group. This treatment was particularly efficient at relieving blocked nose which is a troublesome symptom with a significant socioeconomic burden.

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Conclusion: AIT with 300IR HDM sublingual tablet among adults and adolescents with HDM AR significantly improved nasal symptoms compared to patients receiving placebo despite a higher consumption of rescue medication in the latter group. This treatment was particularly efficient at relieving blocked nose which is a troublesome symptom with a significant socioeconomic burden.

TUESDAY, 4 JUNE 2019
LB TPS 08
ANAPHYLAXIS

LBTP1930 | School board policies on prevention and management of anaphylaxis in Istanbul: Where do we stand?

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Background: Allergic diseases with a potential for anaphylaxis pose a critical public health issue in schools.
Method: Cross-sectional study. Schools were randomly selected from 11 different regions of Istanbul. A questionnaire was filled out by 2596 teachers/school principals from 232 public schools.
Results: A school safety committee was absent in 80% of elementary schools (ES) and 60.8% of preschools (PS). Although some form of health recording system was available in many schools, no such system was available in 24.5% of ESs and 10% of PSs. A specific inquiry for detecting children with food allergies was a routine practice in only 4% of ES and 10% of PS. Approximately 27% of teachers stated that monitoring children in school places was not possible at all times. Eighty four percent stated that no written anaphylaxis treatment protocol was available in their school and only around 2.3% in ES and 3.1% in PS stated that they would perform an epinephrine injection in the event of anaphylaxis.
Conclusion: Our survey demonstrated critical gaps in the organization of schools for the management of children at risk of anaphylaxis. Data derived from this study would provide the initiative for legislators to review the current situation of school health policies along with the relevant authorities to establish school anaphylaxis guidelines.

LBTP1931 | When adrenaline freezes over: Safety of epinephrine autoinjectors in the cold weather—A real-life pilot study

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Background: According to prescribing information, epinephrine autoinjectors should be stored at 20-25°C, with excursions permitted to 15-30°C. However, those recommendations appear in conflict with the idea of ensuring prompt accessibility to epinephrine in out-of-hospital setting, where strict adherence to storage conditions may not always be possible. The aim of this pilot study was to assess the effect of a single, 6-hour exposure to cold weather in real-life setting on the epinephrine autoinjector (EAI) mechanism.
Method: We purchased 4 0.3 mg EpiPen Senior® EAIs (Meda Pharma GmbH & Co. KG, Bad Homburg, Germany) from a local certified pharmaceutical wholesaler and brought them to a skiing resort in Trysil, Norway, while ensuring no extreme temperature excursions on the way. On the day of experiment, we left one EAI in an air-conditioned room with a constant temperature of 20°C. We brought the other 3 to a day of skiing-keeping one of the EAIs in the jacket breast pocket, one in the pants side pocket and one in a backpack. After spending 6 hours outside (from 9:00 AM to 3:00 PM), we took the EpiPens out, inspected them visually, injected the contents of each EAI into a test tube and measured its volume.
Results: During the experiment, the ambient temperature ranged from −22.1°C to −16.5°C, according to the data from the closest weather station. On visual inspection of EAI no discoloration, cloudiness, or visible particles were seen. We observed no malfunction of delivery mechanism when injecting contents of EAIs carried in pants and jacket pockets, as well as control, obtaining equal volumes of 0.3 mL from each. The injector carried in the backpack fired the needle correctly, but the solution was not expelled into the test tube.
Conclusion: While patients at risk of anaphylaxis should always carry their adrenaline autoinjectors with them, exposing EAIs to extreme cold can potentially result in critical underdosing of epinephrine. Concerningly, our study showed that the backpack, which for many would be the first choice place to carry their medication, was the only location in which the solution froze and was not expelled, despite the needle being fired thus mimicking correct function. Epipens kept in coat and pants pockets remained functional. We hypothesize that the body heat could play a role in keeping the EAI temperature high enough to prevent freezing, therefore carrying autoinjectors as close to the body as possible appears advisable.

LBTP1932 | Parenteral knowledge of anaphylaxis and their performance in epinephrine auto-injector use: A survey in Turkish patients

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[1]Çukurova University Faculty of Medicine, Adana, Turkey; [2]Sanliurfa Child Disease Hospital, Sanliurfa, Turkey

Background: Anaphylaxis is an increasingly common life-threatening allergic reaction and immediate recognition of signs and symptoms and quick initiation of therapy with Epinephrine Auto-Injector (EAI) is critical for recovery. Not only parenteral knowledge about anaphylaxis but also the correct use of EAI plays a crucial role in the

management of anaphylaxis. This study aimed to assess the knowledge and perception of patients' parents who were prescribed EAI for potential anaphylaxis. The study also examined their practical performance in administering EAI and identify possible misuse of the device.

Method: 106 families caring for children at risk of anaphylaxis were included in the study. All parents completed a questionnaire and the correct use was verified by the physician using a trainer with a five-step examination.

Results: Anaphylaxis was described as a life-threatening reaction by 93 parents (87.7%) and 84 parents (79.2%) stated that they can easily recognize anaphylactic reaction. However, when parents were asked to describe the symptoms of anaphylaxis, only 50 parents (47.2%) were able to describe anaphylactic shock symptoms requiring EIA use correctly. In case of a recurrence, only 64 parents (60.4%) stated that they would promptly use an adrenalin auto-injector. Regarding the measures to prevent anaphylaxis, 76 parents (71.7%) stated that they pay attention for elimination for prophylaxis, 18 parents (17%) said that they informed the other caregivers of children about anaphylaxis. Only 11 parents (10.4%) had an anaphylaxis action plan and only 1 parents' child had a warning necklace/wristband. Overall, only 49 parents (46.2%) carried EAI device with them consistently in daily life and only 12.1% of the parents used epinephrine IM when anaphylaxis recurred. The main reasons for not using EAI reported by parents were that there was no EAI with them (41.2%), they were afraid and did not feel sufficiently qualified (39.3%) (Table 1). 39 parents (36.8%) responded that they believed they knew the correct use of EAI, but only 12 parents (11.3%) were able to show all five steps of the correct use of the device (Table 2).

Conclusion: These data clearly indicate that parents' knowledge and practical performance regarding diagnosis and management of anaphylaxis in children are still inadequate.

TABLE 1. Knowledge of parents regarding the use of the EAI (Penepin) prescribed for 106 children

Indications for use of the EAI	Number (% of 106 parents)
Cutaneous symptoms (angioedema, urticaria)	30 (28.3%)
Respiratory symptoms (breathing difficulties)	23 (21.7%)
Collapse or feeling of faintness	3 (2.8%)
Anaphylactic shock	50 (47.2%)
EAI availability	
At daily life	49 (46.2%)
At school	8 (7.5%)
During sport activities	7 (6.6%)
During outdoor activities	29 (27.4%)
In restaurants	31 (29.2%)
Anaphylactic shock recurrence	33 (31.1%)
EAI use when anaphylactic shock recurred (% of 33 cases)	4 (12.1%)
Reasons for not using EAI (% of 33 cases)	
Not carrying device consistently	14 (41.2%)
Being afraid and feeling not qualified	13 (39.3%)
Waiting until the attack resolves spontaneously	3 (9%)
Prefer to attend nearest hospital	3 (9%)

LBTP1934 | Epinephrine prescription in emergency department

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Allergy Section General University Hospital of Ciudad Real, Ciudad Real, Spain

Background: Anaphylaxis is an acute severe life-threatening systemic hypersensitivity reaction which requires rapid recognition and treatment. Epinephrine is the first line of treatment for anaphylaxis, and its prompt administration reduces the mortality of this disease. Epinephrine autoinjectors (EAI) are recommended in patients at risk of anaphylaxis. The objective of our study was to determine the rate of epinephrine administration in patients with anaphylaxis attended in the emergency department (ED) of General University Hospital of Ciudad Real. We also reviewed the rate of prescription of EAI when the patient was discharged from the ED.

Method: We performed a retrospective study, reviewing the clinical history of patients attended in the ED during the year 2017. Patients with clinical criteria for anaphylaxis were included in the study. Data about age, gender, etiology, severity and prescription of epinephrine and EAI were collected.

Results: 95.552 patients were attended in the ED in 2017, 115 of them showed clinical criteria for anaphylaxis (0.12%). 61.7% of the patients were men, with a mean age of 33.78 (range from 1 to 94 years). 71% of the patients were adults and 29% children. Food allergy was the main cause of anaphylaxis (51%) followed by drugs (28%). 17.39% were severe anaphylaxis (Brown). Only 32.17% of the anaphylaxis were treated with Epinephrine in the ED. Treatment with Epinephrine was significantly higher in severe anaphylaxis. Excluding anaphylaxis caused by drugs (no indication for EAI), the rate of EAI prescription was 26.9% (vs 74% prescribed by allergist after study.

Conclusion: The rate of Epinephrine treatment and EAI prescription was very low in our ED. These data enforce the need to train ED staff in prevention and treatment of anaphylaxis.

LBTP1935 | Underdiagnosis of anaphylaxis in the County Emergency Clinical Hospital of Targu Mures: Misdiagnosed or miscoded?

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Background: Anaphylaxis has been defined as a severe, life-threatening generalized or systemic hypersensitivity reaction which is characterized by being rapid in onset with life-threatening airway, breathing or circulatory problems; it is usually, but not always, associated with skin and mucosal changes. Anaphylaxis is a clinical emergency and all healthcare professionals should be familiar with its acute and ongoing management, clinical findings vary markedly from patient to patient, sometimes the diagnosis is difficult.

Method: Of patients admitted to the ED of County Emergency Clinical Hospital of Targu Mures (nearly 70 000 per year) those with possible allergic diseases between 1 January 2013 and 31 December 2018 were included in this study (6300 allergic presentation in 6 years).

Results: The International Classification of Diseases-10 codes were used to search computer records and 25 patient were identified with hospitalization for anaphylaxis. Due to the fact to the non-specific nature of anaphylactic symptoms, the diagnosis can easily be overlooked.

Conclusion: For all these reasons under-diagnosis and under-reporting are likely to be common and as a result epidemiological measures are likely to underestimate the true disease burden. Emergency physicians should become more aware of the definition of anaphylaxis to avoid them being misdiagnosed as an allergic reaction only.

LBTP1936 | Evaluation of the safety of administration of yellow fever vaccine in patients with history of egg anaphylaxis

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Background: Yellow Fever (YF) is responsible for 200 000 cases and 30 000 annual deaths with 20-50% of fatality rate. Endemic disease in Africa and South America has an effective protection form, the vaccine. Yellow fever vaccine (YFV) is derived from strain 17D, composed of live attenuated amaryl virus vaccine, grown in hens' egg, with effectiveness of 95%. Anaphylaxis rate for YFV ranges from 0.8 to 1.8/100 000 doses related to egg allergy or other constituents, such as gelatin. Egg allergy in children has prevalence of 0.5-2.5%. In Brazil where YF is an endemic disease, the role of the allergist in researching and elaboration protocols for adequate immunization of egg allergic patients becomes essential.

Method: Longitudinal study was performed with patients referred to drug allergy unit with egg anaphylaxis diagnosis documented by clinical history and skin prick test (SPT) and/or ImmunoCap serum IgE (sIgE). They were submitted to SPT with undiluted YFV and/or intradermal test (ID) with YFV at 1:100 dilution. All patients received YFV in different protocols, according to the results of the tests.

Results: Ten patients aged 10 months-16 years were diagnosed with egg anaphylaxis. Common symptoms related were urticaria (90%), angioedema (60%), vomiting (80%), dyspnea (20%), sleepiness (20%) and hypotonia (10%). Of the 8 patients submitted to SPT with egg, 100% presented positive test; of the 8 patients submitted to sIgE, 75% had positive test (sIgE >3.5 kUA/L). All study patients comproved egg sensibility. Only 1 patient had positive SPT and 3 patients had positive ID with YFV. Subsequently, 5 patients were submitted to YFV administration in 4-steps according to the ASBAI protocol (Table 1), 2 patients in 2-steps (50% + 50% of the YFV) and 3 patients in single dose. All patients were observed for 60 minutes. Anyone had serious adverse events.

Conclusion: YFV has been shown to be safe even in patients with history of egg anaphylaxis. We suggest review the current protocols and make possible short-term YFV vaccination of patients with history of egg anaphylaxis in 2-steps or even single-dose not staggered.

Time (minutes)	Dose (mL)
0	0.05 (1:10)
30	0.05 (1:1)
60	0.15 (1:1)
90	0.30 (1:1)

Yellow fever vaccine produced by Bio-manguinhos/Fiocruz—lyophilized multidose with 5 doses.

LBTP1937 | Safety and efficacy data of AK002, an anti-siglec-8 monoclonal antibody, in patients with indolent systemic mastocytosis (ISM): Results from a first-in-human, open-label phase 1 study

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Background: ISM is a rare disease characterized by clonal proliferation of and excessive mediator release from activated mast cells (MCs). ISM patients (pts) experience debilitating heterogeneous symptoms and substantial quality of life (QoL) impairments. There are no approved therapies for ISM. AK002 is an antibody to Siglec-8,

Symptom	MSQ (0-10 Scale) (n = 8)*		MAS (0-4 Scale) (n = 11)*	
	Baseline Score	% Improvement at Week 21-22	Baseline Score	% Improvement at Week 21-22
Itching	3.7	56%	1.8	53%
Hives	4.2	38%	1.6	59%
Flushing	4.1	46%	1.7	57%
Abdominal pain	3.4	60%	1.4	84%
Diarrhea	2.9	49%	1.0	72%
Headache	3.7	50%	1.5	57%
Fatigue	5.1	47%	2.2	22%
Difficulty concentrating	3.9	59%	1.6	30%
Muscle pain	3.6	27%	2.0**	22%**
Joint pain	3.4	26%	(2.0**)	(22%**)

*3 pts were enrolled before MSQ PRO was available; one drop-out due to protocol deviation.

**In MAS PRO, bone, joint, and muscle pain were combined.

an inhibitory receptor selectively expressed on MCs and eosinophils (eos). Studies have shown that AK002 inhibits MCs, depletes eos, and improves symptoms in pts with MC- and eos-driven diseases. This study evaluated single ascending doses and multiple doses (MD) of AK002 in ISM. Here we present results from the MD arm of the study.

Method: Eligible pts were diagnosed with ISM per WHO criteria and had active symptoms despite treatment with antihistamines and other antimediator therapies. All pts provided informed consent. MD pts received 6 monthly doses: initial dose of 1 mg/kg and subsequent doses at 1, 3, 6, or 10 mg/kg. Primary endpoint was safety/tolerability. Pt-reported outcomes (PRO) were measured by Mastocytosis Symptom Questionnaire (MSQ), Mastocytosis Activity Score (MAS), and Mastocytosis-QoL (MC-QoL).

Results: 12 pts enrolled in the MD arm of the study. AK002 was well-tolerated and only mild/moderate treatment-related adverse events (AE) occurred. The most common AE was infusion-related reactions (flushing, feeling hot, headache, erythema, fatigue, or dizziness), which occurred mostly during the first infusion. MSQ and MAS scores improved from baseline (BL) to Week 21-22 across all measures (Table). MC-QoL scores improved from BL to Day 145 in all domains: skin (44%), symptoms (39%), social life/functioning (42%), and emotions (57%).

Conclusion: AK002 was well-tolerated and showed consistent and significant improvements in symptoms and QoL. These results support further evaluation of AK002 as a new therapy for ISM.

LBTP1938 | Anaphylaxis due to occupational allergy to *Locusta migratoria* and *Schistocerca gregaria*

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Case report: *Locusta migratoria* (migratory locust) and *Schistocerca gregaria* (desert locust) are two types of acridid grasshoppers belonging to the order of *Orthoptera*. Swarms of locusts are known to be accompanied by outburst of asthma. Moreover, allergies have been reported in laboratory workers, zookeepers or pet keepers of reptiles fed with locusts. The European Union recently allowed human consumption of *Locusta migratoria*, what will likely result in an increase of locust breeding. Here, we present the case of a 29-year old male PhD student with underlying house dust mite allergy. He was seen at the outpatient clinic due to gradually worsening of severe asthmatic attacks and even systemic symptoms (including skin rash) upon entering the building where both locusts were bred. Skin prick tests (SPT) were strongly positive for both locusts, including the faeces. Basophil activation tests (BAT) using raw extracts of different isolated parts of both types of locusts confirmed the reactivity. By means of a control, two of his colleagues were tested using SPT and BAT. One colleague with symptoms had positive SPTs, whereas an asymptomatic colleague had negative SPT results. However, BAT showed a strong positive result for the colleague who reported symptoms, but surprisingly, the asymptomatic colleague showed reactivity to all *Schistocerca gregaria* extracts as well. An immunoblot using the patient's serum showed strong binding to protein bands with a molecular mass between 50-70 kDa in the whole body

extract of both *Locusta migratoria* and *Schistocerca gregaria*, and the faeces of the latter. The symptomatic control reacts to proteins of the whole body extracts in the same range, although less strongly.

In conclusion, we report the case of a patient with occupational anaphylaxis to locusts, endorsing the allergenicity of *Schistocerca gregaria* and *Locusta migratoria*. Together with a presumed increased exposure of laboratory workers and farmers and increased consumption in future, we warrant for sufficient safety measures to reduce the sensitization in exposed employees or researchers.

LBTP1939 | Idiopathic Anaphylaxis or Allergic reactions to Carmine (E120)?

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Background: Nowadays there are a lot of additives used in the food industry. Fortunately only a few have been implicated in adverse reactions.
Method: We have to think about food additives in Allergic reactions (Urticaria, Angioedema, Anaphylaxis…). Cochineal extract ir Carmine (E 120) is a red food dye used in many foodstuffs. We can find it in jam, butter, cookies, yogurt, different meats. We present 2 patients with initially Idiopathic Anaphylaxis diagnosis. They refer reactions with different foods: pizza, sausage, jam sandwich, ice cream. In the evaluation of these patients we make screening with multiple foods skin prick test. We also make blood test with Ig E immunoassays for some food additives. Even we look for a purified preparation of the additive we suspect. Oral challenge is the best process to confirm food additives reactions.
Results: Multiple screening foods skin prick test was negative in both patients.

Carmine Ig E was positive in both patients (6.04, 4.17 KU/L). Purified preparation of the additive Skin Prick by prick with Cochineal extract (E 120) was positive in both patients. We made 4 negative controls. Both patients refused Oral challenge procedure. We recommended to avoid commercially prepared foods that contain Cochineal extract. Patients keep asymptomatic since they avoid cochineal extract.
Conclusion: Specific food additives like Cochineal extract or Carmin (E 120) could be implicated in true Allergic reactions (Ig E mediated). We have to think about it and excluding food additives as a cause of reactions.

LBTP1940 | Food anaphylaxis to quinoa seed

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Background: Anaphylaxis to quinoa is rare but could gain in frequency due to changing diet habits. We report 3 cases of food anaphylaxis to quinoa.
Method: Case 1: A 10-year-old girl with history of vulvar lichen sclerosus, eczema, asthma, outgrown egg allergy and persistent allergy to all nuts, lightly cooked chestnut and buckwheat presented a grade 2 anaphylaxis with urticaria, facial edema, rhino-conjunctivitis and breathing.

Case 2: A 12-year-old boy with history of eczema, asthma, outgrown IgE-mediated food allergies to milk and egg, persistent food allergy to nuts, fish and kiwi, and asymptomatic sensitization to wheat and buckwheat declared two episodes of grade 2 exercise-induced anaphylaxis with malaise urticaria, dyspnea and abdominal pain.

Case 3: A 64-year-old horticulturist without any history of allergy had a grade 3 anaphylaxis with deep faintness, urticaria, chest pain and trembling after eating a bulgur quinoa tuna salad.
Results: Prick tests and specific IgE to quinoa were positive in the 3 cases. Immunoblotting analysis identified a highly IgE-reactive band of 51 kDa with all 3 patient sera in crude quinoa extract, as well as a band of 63 kDa with sera of patient 1 and 2 and further highly reactive bands of 11, 49, 85 and 100 kDa with serum of patient 1.
Conclusion: Chenopodium quinoa is a drought and frost resistant gluten-free plant, rich in calcium and iron, in omega 3 and 6 polyunsaturated fatty acids and high quality protein, providing all essential amino acids with values close to those set by the FAO for ideal protein equilibrium and similar to milk casein. 11S globulins (chenopodin) and 2S albumins are its principal storage proteins.

Native chenopodin is composed of six 55-62 kDa heterodimers of A and B subunits, of 30-40 kDa and 20-25 kDa respectively, joined by disulfide bonds. Chenopodin A was found to be implicated in one of the 2 cases of quinoa allergy reported in the literature. The 51 kDa band we identified could correspond to the class of 7S globulins. Cross reactivity has been described between 11S and 7S globulins of quinoa and buckwheat. Because of its potential therapeutic effects in the prevention of cardiovascular disease, cancer and aging

TABLE 1. Immunoblot analysis with the 3 patient sera in crude quinoa extract

Quinoa proteins (kDa)	Patient 1	Patient 2	Patient 3
200	+		
150	+		
100	++	+	
85	++		
63	++	++	
51	++	++	++
49	++		
39	+		
36	+		+
30	+		
24	+	+	+
11	++		

process and as substitute for wheat, milk and animal proteins, quinoa is increasingly included in modern diets. Quinoa allergy may therefore be expected to increase in the future. It should be assessed by carefully taking the patient's medical history and by including it in food allergy testing panels.

LBTP1941 | Manioc anaphylaxis & Hevamine A: A new latex protein involved in latex-fruit syndrome cross-reactivity

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Background: Manioc or cassava is one of the foods involved in the latex-fruit syndrome. Up to now, all the manioc allergic patients published had skin-related symptoms or anaphylaxis to manioc and also to latex. Hev b 5 latex allergen has been implicated in clinically relevant cross-reactivity with manioc.

Method: We present a 47 years old woman suffering from anaphylaxis with elevated serum tryptase, after manioc intake. She has never had either previous symptoms to latex nor to fruits. 4 months later, she complained about possible cutaneous symptoms due to contact with domestic rubber gloves, to a sip of an almond drink and also to a chestnut intake. Normal baseline tryptase and positive dermographism was documented.

Results: In vivo study yield positive results for manioc prick-prick (5 × 4) and latex prick test (5 × 5). A prick test battery with most relevant latex related fruits including almond and chestnut was negative. Glove use test with sterile sanitary latex gloves, contact exposure to rubber gloves implicated in anamnesis and controlled provocation with the same almond drink, were also negative.

In vitro study showed a specific IgE by ImmunoCAP (Phadia) to manioc 3.89 kUA/L, rHev b 5 4.62 kUA/L and negative to rHev b 1, rHev b 3 and rHev b 6.02. The patient's serum revealed through Immunoblot with latex, avocado, chestnut and banana extract the recognition of a 26 kDa protein in all extracts and a 14 kDa protein just in manioc and latex. An immunoblot inhibition with latex was carried out with manioc, avocado, chestnut and banana extract and just one protein of 26 kDa was inhibited in all extracts. The 26 kDa protein was identified according to mass spectrometry analysis as Hevamine A.

Conclusion: Manioc allergy without clinical symptoms to latex nor to latex-fruit syndrome food, has never been reported before, although manioc and latex co-sensitization through Hev b 5 is well documented. We have identified Hevamine A as a new latex protein involved in the latex-fruit síndrome.

LBTP1942 | Recurrent acute urticaria as precursor of wheat dependent exercise-induced anaphylaxis

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Background: IgE-mediated allergy to the wheat protein omega-5-gliadin is associated with wheat-dependent exercise-induced anaphylaxis (WDEIA), where exercise acts as a cofactor, although other cofactors could trigger the symptoms. We present 4 cases of Tri a 19 allergy, all of them WDEIA but initiated as recurrent acute urticaria.

Method: Skin prick test with aeroallergens as well as with food allergen (Leti Laboratory, Madrid, Spain), blood test for study of urticaria, tryptase, total IgE as well as specific IgE to wheat and Tri a 19 were performed in the four patients.

Results: The average age of patients was 45 years old. They started with reactions between 3 and 7 years before being diagnosed. All of them presented recurrent acute urticaria before the episodes of anaphylaxis, and at least 2 episodes induced by exercise, although NSAIDs and stress were implicated in some episodes as other cofactors. Skin prick test with aeroallergens were positive to D. pteronyssinus in 3 patients and grass and olive pollen just in one. Skin prick test to wheat was positive in 50% patients, and negative the rest of food tested.

Blood test with blood count, ESR, coagulation, liver, kidney, thyroid function tests, autoimmunity and complement was within normal parameters. Total IgE was high in ¾ patients. Serum tryptase was normal in all patients.

Wheat IgE was positive in 2/4 patients and Tri a19 positive in all of them. The four patients tolerate cereals being at rest and tolerate exercise if avoid cereals 3 hours before. Challenges with culprit NSAIDs were performed with good tolerance at rest.

Conclusion: Specific IgE to Tri a 19 it must be considered in the diagnosis of patient with recurrent acute urticaria or idiopathic anaphylaxis. Exhaustive clinical history looking for cofactors is very important for diagnosing these profile of patients.

LBTP1943 | Case of anaphylactic shock to beer

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Background: Beer is one of the alcoholic beverages with more consumption over the world but despite this allergy reactions are unusual. We present a case report of an 18-year-old male with personal

history of mild intermittent asthma, who presented a severe anaphylactic shock (dyspnea, hypotension and unconsciousness with cardiorespiratory arrest) shortly after beer ingestion (Chimay Blue®).

Method: Skin Prick Test (SPT); Serum-specific IgE determinations (ImmunoCAP®); SDS-PAGE and Western Blot.

Results: SPT to aeroallergens: Positive to dust mites, molds, dog dander and pollen (grass mix, Chenopodium, olive).

SPT to commercial foods and cereals: Mild positive to rice (correct tolerance). Negative the rest, including non-specific lipid transfer proteins (nsLTPs).

SPT with beers (Steinburg Dark®, Bock-Damm®, Leffe Brune®, Duvel®): All positive.

Serum-specific IgE determinations (ImmunoCAP®) to Cladosporium (3.1 kU/L), Alternaria (8.63 kU/L), wheat (0.05 kU/L) and hops (0.28 kU/L).

SDS-PAGE and Western Blot with different beers, Chimay Blue® (1), Chimay Red® (2), Estrella Damm® (3), Estrella Galicia® (4), Daura Damm® (5), Leffe® (6), showed IgE-binding proteins between 35 and 75 kDa for the extracts number 1, 2, 5 and 6 and one IgE-binding protein of 18 kDa for the extracts number 1 and 2.

Conclusion: We present a case of anaphylactic shock in a patient with mild intermittent asthma and predominant sensitization to molds and grass. The immunological study (SPT and in vitro study) suggest that our patient is sensitized to a different allergen from those previously described (those related to cereals or nsLTPs, typical in our area). The several ingredients and methods used in beer elaboration launch a challenge in the identification of culprit allergens.

LBTP1944 | The healthy food paradox: Anaphylaxis to baobab

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Case report:

Background: Baobabs (Adansonia digitata) are plants characteristic of Sub-Saharan Africa, Madagascar, and North-West Australia, whose fruits have been largely used by the local populations as food and medications. Recently, the cosmetic, wellness, and food industries have promoted the baobab-based products, in the developed countries, to address the growing interest in natural/organic products (e.g. vegan lifestyle). However, not all the natural products are totally safe, regardless of their healthy properties. We report the first case of anaphylaxis due to baobab fruit food allergy.

Method: A 31-year-old Caucasian woman presented at the Emergency Room for anaphylaxis few minutes after ingesting, for the first time, a particular vegan snack. The allergologic diagnostic work-up included in vivo (skin tests) and in vitro (specific IgEs by ImmunoCAP, Immunoblot, and direct ELISA) testing with all the ingredients of the snack; moreover, ELISA inhibition experiments were performed to investigate if such event could be the result of a cross-reaction with food or airborne allergens.

Results: Out of all the tested ingredients, only the baobab fruit resulted positive, and potential cross-reactions were ruled out. Any other possible cause of anaphylaxis was excluded. The SDS-PAGE profile of baobab fruit showed different protein components, and the IgE-immunoblot analysis detected two IgE-binding regions at about 40 and 60 kDa, in the patient's serum. She was discharged with the indication of strict avoidance of all kind of baobab-based products and provided with self-injectable adrenaline.

Conclusion: This is the first case of food allergy to baobab fruit, that occurred with anaphylaxis, apparently at the first exposition to baobab. After ruling out possible cross-reactions, the episode could be explained by an overlooked previous sensitization to baobab, through alimentary (i.e. as an hidden ingredient in vegan foods) or percutaneous pathways ("natural" cosmetics). Baobab fruit may be an important allergen, able to trigger anaphylaxis due to food allergy. Taking into account the spreading fashion for natural products, special attention should be paid on new emerging "natural healthy" products (e.g. food and cosmetics), like the baobab. Prick-to-Prick proved to be a reliable diagnostic test to identify baobab fruit allergy.

LBTP1945 | Glutaraldehyde modified allergen extract immunotherapy are able to cause anaphylaxis as an adverse reaction?

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Background: Several studies have demonstrated that subcutaneous allergen immunotherapy is an efficacious and safe approach to treat allergic diseases. Glutaraldehyde-modified allergen extracts offer several benefits compare to native allergen extract vaccines. The principal objective was to evaluate the safety of immunotherapy, in an Allergy Clinic in Madrid (Spain) in the last 18 years using therapeutic vaccines comparing modified and unmodified allergen extracts.

Method: The period analyzed was from 01/01/2000 to 28/02/2019. All injections were administered in the immunotherapy unit of the Clinic and recorded using specific software (Inmunowin®). Patients were in their majority allergic to pollens and received therapeutic modified and unmodified vaccines. Safety was assessed by recording all side reactions related to immunotherapy.

Results: The total number of injections administered during this period was 236 259. From these, 132 769 (56.2%) correspond to unmodified allergen preparations and 103 490 (43.8%) to modified. In the last 8 years this proportion had change (79 366 injections), observing 68 368 (86.1%) for modified and 10 998 (13.9%)

for unmodified vaccines. The total immediate systemic reactions in 19 years was 338 (total), 136 (40.2%) for modified and 202 (59.8%) for unmodified (P = 0.189). However, we detected 2 severe adverse reactions (anaphylaxis: 1/70 000 injections) related with unmodified immunotherapy. On the contrary within 103 490 modified injections we didn't observed any anaphylaxis.

Conclusion: Anaphylaxis was detected only with unmodified immunotherapy but not with modified immunotherapy.

LBTP1947 | A complete honeybee "venome". Improving diagnostic and therapeutic tools

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Background: The knowledge of the composition of the Hymenoptera venom and the structure of the allergens that compose it is a prerequisite to carry out more accurate diagnosis and treatment. The composition of the honeybee venom (HBV) is a mixture of proteins with proteolytic activity in its majority. After application of the most recent proteomic models it has been revealed that there are more than 100 components, of which 12 have been described as allergens nowadays. The presence and the amount of these allergens in therapeutic and diagnostic extracts, might be easily affected by natural variations of the source material, different work-up strategies or even by degradation of particular components.

Method: Our aim has been to compare an autochthonal Spanish crude HBV with a referenced commercially available crude HBV extract (Latoxan, France) by using proteomic tools for demonstrate the total representation of the allergens so far described for *Apis mellifera* venom. The electrophoretic profile of both HBV was carried out by mono and bidimensional SDS PAGE at reduced conditions. The allergenic properties of both extracts were performed by Western blot using a pool of patients' sera with different profiles of sensitization to HBV. The biological potency and the enzymatic activity of Api m 1 were also determined.

Results: The electrophoretic profiles of both HBV were similar, revealing compatible bands with the component-resolved allergens described (Api m 1, Api m 2, Api m 3, Api m 4, Api m 5 and Api m 10), showing some differences possibly due to the natural variations of each extract. The allergenic profile, biological potency and enzymatic activity of Api m 1 did not present significant differences for both extracts.

Conclusion: Our data demonstrate similarities about the quality and characteristics of crude HBV extracts in terms of antigenic and allergenic content. This fact highlights the autochthonal Spanish crude HBV is a good candidate to be used in diagnosis and treatment of *Apis mellifera* allergy.

LBTP1948 | Latex immunotherapy: An exceptional improvement in quality of life

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Case report: Latex allergy is an emerging problem whose prevalence has increased in recent decades. It is important to highlight its presence in a number of products in our every day's life, making this disease dramatic for some patients, especially among certain professional categories. Specific immunotherapy has been suggested as the only therapeutic capable of influencing the natural history and inducing specific desensitization.

The authors describe a case of latex allergy in a 36-year-old woman, who worked as cultural animator. At the age of 26 she began to experience many episodes of palpebral angioedema and rhinitis symptoms, minutes after banana, kiwi and other tropical fruits ingestion. In one of these episodes, after eating banana, she presented at the emergency room with gradually worsening symptoms of facial angioedema, dyspnea and severe rhinitis symptoms. During the follow-up in Allergy and Clinical Immunology consultation she initiated symptoms of dyspnea and wheezing, often 3-4 times per week that were related to exposure to rubber balloons in the workplace. She even presented with palpebral angioedema, nasal obstruction and dyspnea after injection of Amoxicillin. Diagnostic workup started by skin prick tests (SPT), which was positive to latex, passion fruit, banana and negative to chestnut allergens. Blood-specific IgE (sIgE) were positive to Havea braziliensis, Hev b 5 and Hev b 6, with respectively values: 25.5 KU/L, 3.49 KU/L and 5.46 KU/L. Prick-to-prick tests (PTP) and sIgE for banana, chestnut and passion fruit allergens were negative. Skin tests to betalactams were negative and also oral challenge test with Amoxicillin. She started rush sublingual immunotherapy (SLIT) with latex at 27 years old and complied 3 years. During the SLIT she presented a significant improvement in respiratory symptoms, presenting only clinical exacerbations once a month, under adjuvant therapy with inhaled budesonide and formoterol (160/4.5 mcg) twice daily. During immunotherapy, the patient got pregnant and did not present clinical worsening. Under this period the inhaled therapy was adjusted to low dose of inhaled corticosteroid. At this moment, she tolerates banana and passion fruit ingestion and she presents only an oral allergy syndrome with exposure to kiwi and chestnut.

Finally, she changed her job by choice and is currently working as a Radiology Technician, tolerating exposure to a latex environment and using, as an alternative, vinyl gloves on direct contact.