An Artificial Intelligence Approach to Thrombophilia Risk

João Vilhena, Universidade de Évora, Évora, Portugal

Henrique Vicente, Universidade de Évora, Évora, Portugal

M. Rosário Martins, Universidade de Évora, Évora, Portugal

José Grañeda, Hospital do Espírito Santo de Évora, Évora, Portugal

Filomena Caldeira, Hospital do Espírito Santo de Évora, Évora, Portugal

Rodrigo Gusmão, Hospital do Espírito Santo de Évora, Évora, Portugal

João Neves, Drs. Nicolas & Asp, Dubai, UAE

José Neves, Universidade do Minho, Braga, Portugal

ABSTRACT

Thrombophilia stands for a genetic or an acquired tendency to hypercoagulable states, frequently as venous thrombosis. Venous thromboembolism, represented mainly by deep venous thrombosis and pulmonary embolism, is often a chronic illness, associated with high morbidity and mortality. Therefore, it is crucial to identify the cause of the disease, the most appropriate treatment, the length of treatment or prevent a thrombotic recurrence. This work will focus on the development of a diagnosis decision support system in terms of a formal agenda built on a Logic Programming approach to knowledge representation and reasoning, complemented with a computational framework based on Artificial Neural Networks. The proposed model has been quite accurate in the assessment of thrombophilia predisposition (accuracy close to 95%). Furthermore, the model classified properly the patients that really presented the pathology, as well as classifying the disease absence (sensitivity and specificity higher than 95%).

KEYWORDS