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Risk Assessment Tools Applied to Deep Vein Thrombosis Patients Treated with Warfarin

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Abstract : Background: Vitamin K antagonists particularly warfarin is the most frequently used oral medication for deep vein thrombosis (DVT) treatment and prophylaxis. Time in therapeutic range (TITR) of the international normalised ratio (INR) is widely accepted as a measure to assess the quality of warfarin therapy. Multiple factors can affect warfarin control and the subsequent adverse outcomes including thromboembolic and bleeding events. Predictor models have been developed to assess potential contributing factors and measure the individual risk of these adverse events. These predictive models have been validated in atrial fibrillation (AF) patients, however, there is a lack of literature on whether these can be successfully applied to other warfarin users including DVT patients. Therefore, the aim of the study was to assess the ability of these risk models (HAS BLED and CHADS2) to predict haemorrhagic and ischaemic incidences in DVT patients treated with warfarin. Methods: A retrospective analysis of DVT patients receiving warfarin management by a private pathology clinic was conducted. Data was collected from November 2007 to September 2014 and included demographics, medical and drug history, INR targets and test results. Patients receiving continuous warfarin therapy with an INR reference range between 2.0 and 3.0 were included in the study with mean TITR calculated using the Rosendaal method. Bleeding and thromboembolic events were recorded and reported as incidences per patient. The haemorrhagic risk model HAS BLED and ischaemic risk model CHADS2 were applied to the data. Patients were then stratified into either the low, moderate, or high-risk categories. The analysis was conducted to determine if a correlation existed between risk assessment tool and patient outcomes. Data was analysed using GraphPad Instat Version 3 with a p value of <0.05 considered to be statistically significant. Patient characteristics were reported as mean and standard deviation for continuous data and categorical data reported as number and percentage. Results: Of the 533 patients included in the study, there were 268 (50.2%) female and 265 (49.8%) male patients with a mean age of 62.5 years (±16.4). The overall mean TITR was 78.3% (±12.7) with an overall haemorrhagic incidence of 0.41 events per patient. For the HAS BLED model, there was a haemorrhagic incidence of 0.08, 0.53, and 0.54 per patient in the low, moderate and high-risk categories respectively showing a statistically significant increase in incidence with increasing risk category. The CHADS2 model showed an increase in ischaemic events according to risk category with no ischaemic events in the low category, and an ischaemic incidence of 0.03 in the moderate category and 0.47 high-risk categories. Conclusion: An increasing haemorrhagic incidence correlated to an increase in the HAS BLED risk score in DVT patients treated with warfarin. Furthermore, a greater incidence of ischaemic events occurred in patients with an increase in CHADS2 category. In an Australian population of DVT patients, the HAS BLED and CHADS2 accurately predicts incidences of haemorrhage and ischaemic events respectively.

Keywords : anticoagulant agent, deep vein thrombosis, risk assessment, warfarin
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