Incidence of Thromboembolic Events in Patients with Burns and the need for Significant Prophylaxis

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AIM: To assess the incidence of thromboembolic events in patients with burns and determine the role of significant prophylaxis.

METHOD: The study was a single-centre, retrospective medical record data analysis in an acute care, teaching hospital. Data was obtained through the Medical Record Department with access to coding for Burns (T20-T30), Pulmonary Embolism (126.9) and Deep Vein Thrombosis (I80.2). Data was collected for patients admitted to Royal North Shore Hospital (RNSH) with a diagnosis of “Burns” who had been an inpatient for 22 days between the years 2008-2012 and had been accurately coded. Medical Record Number (MRN) for the patients who developed venous thromboembolic event (VTE) were used to search electronic medical records for further demographics. One multi-trauma patient who was coded for DVT was excluded from the data due to paper notes demonstrating no burn/trauma involvement. This highlights some limitations experienced with coding.

RESULTS: A total of 911 patients admitted RNSH with a diagnosis of “Burns” between the years 2008-2012. Of these 681 (74.8%) were male and 230 (25.2%) were female. Mean age at admission was 42.7 years (Range 0-98). Of the 911, 14 (1.4%) of patients had a thromboembolic event. A total of 3 (0.33%) patients had PE alone, 4 (0.44%) had both DVT and PE and the remaining 7 (0.77%) patients had a DVT alone. Solely male patients had a PE alone or DVT/PE combined, whilst a male dominance was also seen in those with DVT alone. Upon applying an unpaired t-test to compare with the whole cohort (mean 14.1 days) the average length of stay for those diagnosed with a thromboembolic event was 37 days for DVT (P=0.028), 30 days for PE (P=0.087) and 31 days for DVT/PE (P=0.108). The most number of thromboembolic events was 5 in 2009, with the maximum number of DVT cases seen in this year. A hospital history of admission for the those having a thromboembolic event was 38.07 years with a breakdown of 37.86 years (DVT), 33.7 years (PE) and 41.75 years (DVT/PE).

CASE STUDY: One 29 year-old male patient presented to RNSH with trauma following MVA with injuries involving thermal a burn to the left knee which was managed with debridement and SSG. Multiple fractures were also noted including but not limited to right acetabular fracture, compression fractures and scapular fractures. ORIF was necessary for right acetabular fracture under orthopedists. Despite being initially DVT free, he developed a DVT in both lower limbs following 7 days admission. CTPA was conducted on the same day as Doppler ultrasound demonstrating PE on both sides of the lung. Due to multiple risk factors, insertion of an IVC filter was necessary to limit secondary damage caused by the thromboembolic event. This was inserted on the same day as an emergency procedure and removed 26 days later.

DISCUSSION: Burns patients undergo complex haematological changes as a result of injury and possess all of the elements from Virchow’s Triad. Factors including developing antithrombin deficiency and platelet aggregation play a role in increased risk of thromboembolic event1. It is suggested that this risk increases over the duration of admission and recovery2. Past studies have demonstrated an incidence of VTE between 0.4%-7% in burns patients3-4 which is consistent with study data.

A search of incidence of thromboembolic events in burns patients has been indicated to be 40-43%5 which is slightly higher than study data. The higher rates of VTE in males is consistent with previous data6. The incidence of PE and PE and DVT in this study were lower than seen in previous studies consisting of burns patients. The incidence of PE is estimated between 0.61%-1.35%7,8,9,10 and incidence for DVT is estimated to be between 0.9%-6.09%9,10,11 in burns patients. General community Australian risk of VTE is estimated at 0.09%11 which is consistent with hospital data11.

Length of stay (LOS) for each group was compared with cohort data and shown as not statistically significant as a risk factor for VTE as demonstrated by the above P-Values.

Multiple risk factors for thromboembolic events in burns patients have been suggested including long periods of immobilisation, increasing TSBS and obesity12,13,14,15,16,17. All of the patients who developed VTE had received prophylactic heparin. This was changed to therapeutic cloxane and warfarin for management. There has been a substantial increase in IVC filter insertion over the past 20-30 years18 with limited risk of complications19,20. IVC filters have been shown to decrease hospital mortality in unstable and trauma patients21,22. There is strong evidence to support therapeutic IVC filter insertion23 and indications include augmentation of the use of anticoagulants24.

CONCLUSION: Study data is consistent with past research. Incidence of VTE was 1.4% with all receiving prophylactic heparin and one patient having insertion of mechanical IVC filter secondary to extensive PE. Early mobilisation is suggested in combination with chemical and mechanical prophylaxis advisable to decrease risk of VTE in burns patients. High risk patients with a confirmed DVT or PE in whom anticoagulation is contraindicated may also require an IVC filter.

REFERENCES: