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VTE Prophylaxis in the Neurosurgical Population: A Real Brain Teaser

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Background

Hospitalised neurosurgical patients are at high risk of venous thromboembolism (VTE)[1], however their inherent risk of bleeding and requirement for neurosurgical intervention complicates the use of pharmacological prophylaxis.

Aim

To review prophylaxis prescribing patterns in neurosurgical patients in relation to local guidelines, including time to initiation, peri-operative management and use of documented risk assessment tools.

Method

A retrospective audit of patients admitted under neurosurgery from August to October 2016 was conducted through review of electronic medical records. Demographics, diagnosis, time to and type of prophylaxis, surgery timeframes and documentation of risk assessments were recorded.

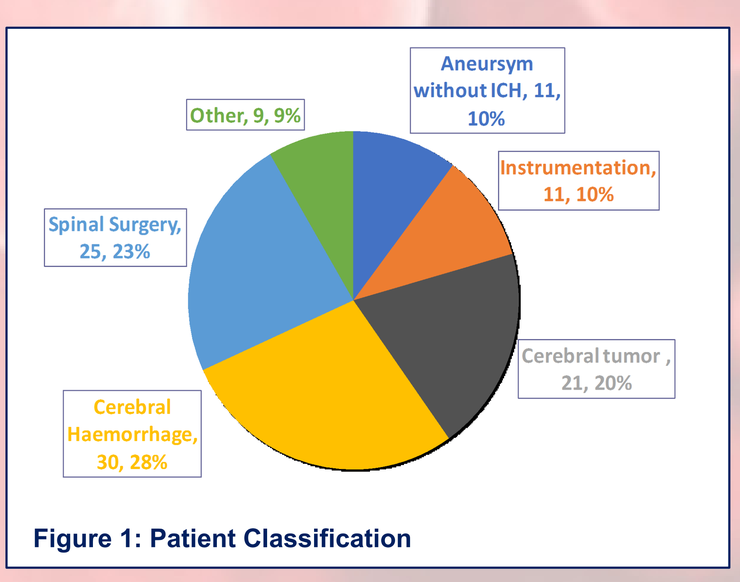

Figure 1: Patient Classification

Results

107 Records were included in the audit. 76% (82) of patients received chemoprophylaxis during their admission with 97% being Heparin 5000units twice daily. Of the 24% of patients without chemical prophylaxis; 60% of these had mechanical prophylaxis charted.

Only 14% of patients had the National Inpatient Medication chart (NIMC) VTE risk assessment completed (Figure 2).

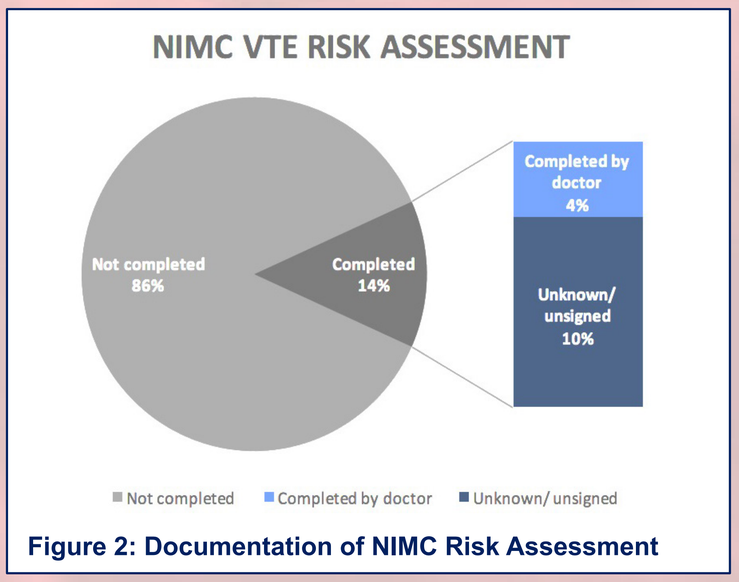

Figure 2: Documentation of NIMC Risk Assessment

53% of patients had the VTE component of the nursing "Patient Risk Assessment" completed on admission to the ward and the daily "Patient Cares" nursing assessment was completed 85% of the time.

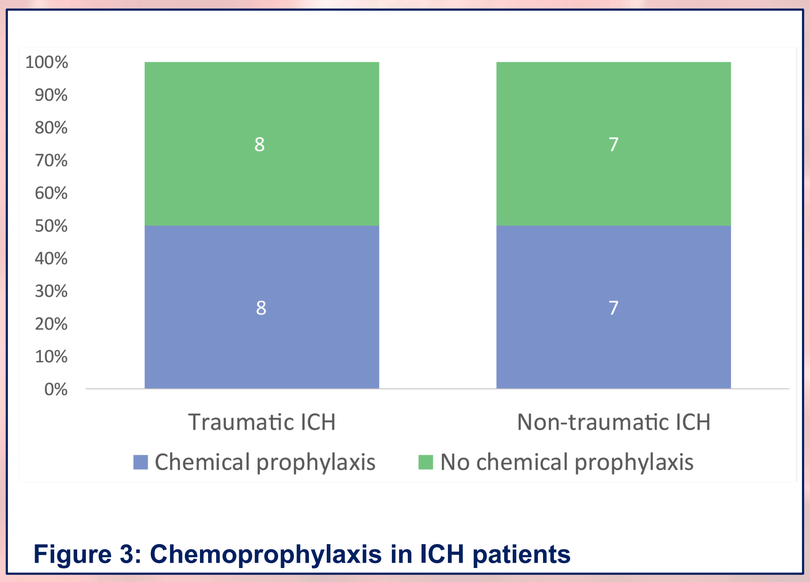

Figure 3: Chemoprophylaxis in ICH patients

30 Patients were classified as having an intracranial haemorrhage (ICH), encompassing subdural haemorrhage, subarachnoid haemorrhage, temporal bleeds and bleeding from malignancy. As shown in (Figures 3 and 4); 53% (16) were classed as traumatic, 50% of these received chemoprophylaxis initiated on average 5 days from admission, with a range of 0-10 days. Of the 14 non-traumatic, 50% had prophylaxis initiated on average 7 days post admission with a range of 1-14 days.

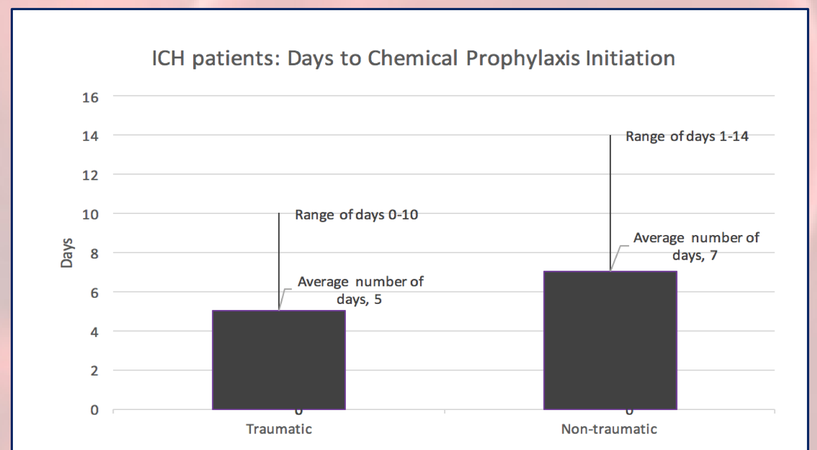

Figure 4: Days to Chemoprophylaxis in ICH patients

Eight patients underwent coiling during the study period. Prophylaxis was not instigated until after coiling with 75% having prophylaxis initiated the day following securement and 100% by day two.

84% of patients undergoing spinal surgery received prophylaxis with 75% initiated the day following surgery. All patients having neurosurgery for cerebral lesions and instrumentation (external ventricular drain, ventriculoperitoneal shunt) had prophylaxis initiated by the day following theatre. For patients already receiving chemoprophylaxis prior to any neurosurgery, therapy was withheld for between 0-3 doses.

Conclusion

Results indicated that whilst the majority of patients without a documented contra-indication received chemoprophylaxis there was a large variance in time to initiation which was most evident in the cerebral haemorrhage cohort. Management of prophylaxis post surgery was generally consistent. The majority of patients were prescribed chemoprophylaxis by 48 hours, however this is not in line with local recommendations of 12 hours. Based on these results the following areas for improvement were identified; consistent management of VTE around intracranial haemorrhage, earlier prophylaxis initiation post spinal, cerebral lesion and instrumentation surgery and increased consistency in withholding of doses pre-neurosurgical intervention. While length of surgery was not assessed in this audit, recent studies have indicated duration of neurosurgery is correlated with risk of VTE and would be a consideration to include in updated guidelines[2]. The areas for improvement will be progressed into updated local guidelines as will use of documented risk assessments to guide safe and timely administration.

References

1. Nyquist P, Bautista C, Jichici D, Burns J, Chhangani S, DeFilippis M et al. Prophylaxis of venous thrombosis in neurocritical care patients: An evidence-based guideline: A statement for healthcare professionals from the neurocritical care society. Neurocrit Care 2016; Feb;24(1):47-60
2. Bekelisk K, Labropoulos N, Coy S. Risk of Venous thromboembolism and operation duration in patients undergoing neurosurgical procedures. Neurosurgery 2017;80(5):787-792.