INFLUENCES ON THE INCIDENCE OF CLINICAL DEEP VEIN THROMBOSIS AND PULMONARY EMBOLISM IN A PROSPECTIVELY COLLATED POPULATION OF 21,000 NEUROSURGICAL INPATIENTS

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This treatise is submitted in partial satisfaction of the requirements for the Degree of Master of Public Health (Honours), The University of Sydney
ABSTRACT

Records of all neurosurgical inpatients admitted to Royal North Shore Hospital since 1976 have been prospectively kept in a relational database. Demographic details, diagnoses, operations and complications have been entered continuously since 1982 by the author of this study. Complications are monitored at monthly review meetings attended by medical staff. The recurrence of deep vein thrombosis (DVT) and pulmonary embolism (PE) at these meetings, despite continual improvements in patient care, prompted this study. It aims to use the database to study changes in the incidence of DVT and PE over the previous twenty years; to find what database variables predict these complications; and whether use of mechanical and pharmacological agents has had an impact on DVT and PE rate. Univariate analysis of the incidence of DVT and PE by age, sex, length of stay (LOS), admission month, diagnosis, operation and surgeon over time was run. Any significant variables were then analysed by multivariate logistic regression. The DVT rate was low by world standards, but rose from 0.6% in 1979-83 to 1.2% in 1984-88, then rose exponentially to 3.60% in 1994-98 with a significantly increasing trend over the twenty years ($\chi^2_{MH} = 114.20$, with IDF, $P<0.001$). PE rate doubled significantly over the twenty years from 0.6% to 1.2% ($\chi^2_{MH} = 17.94$ with 1DF, $P<0.001$). Age, LOS, diagnosis, operation and surgeon were significant predictors of DVT and PE. After adjustment for LOS, time period and age, vascular surgery was found to be the strongest predictor of DVT (OR=2.82, 95% CI: 2.08-3.82, $\chi^2 = 43.91$, $P<0.01$). Vascular diagnosis was the strongest diagnosis predictor. No effect of sex or month of admission was shown. After adjustment for LOS, time period and age, spinal fusion was the strongest predictor of PE (OR=4.04, 95% CI: 1.81-9.03). Anterior communicating artery aneurysm was the diagnosis most highly associated with PE. The rise in DVT rate may be due to increased complexity of surgical and nursing management, and some screening of patients with the introduction of duplex scanning. The doubling of PE rate is unexplained. The risk of brain or spinal cord haemorrhage makes prophylactic anticoagulation a difficult choice. This study reveals groupings which can be used to determine appropriate prophylaxis. Use of mechanical and pharmaceutical agents is not recorded consistently in the database, but it is known approximately when they were introduced. No impact on the rate of DVT and PE can be demonstrated by these agents. More vigilant and widespread use of mechanical prophylaxis might be just as effective in controlling DVT and PE.
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NOTE ON THE AUTHOR’S CONTRIBUTION

With the exception of the assistance mentioned above in the acknowledgements, all the data coding, entry and analysis, and decisions regarding the direction of this treatise, have been undertaken by the author at Royal North Shore Hospital over the last eighteen years.
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