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ORIGINAL ARTICLE

The postoperative venous thromboembolism (TREVO) study – Risk and case mortality by surgical specialty[☆]

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KEYWORDS

Thromboembolism,
venous;
Risk;
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Incidence;
Complication;
Patient safety

Abstract

Introduction and Objectives: Venous thromboembolism, risk of which is increased in surgical patients, is a preventable cause of morbidity and death. The primary objective of this study was to estimate the incidence of symptomatic postoperative venous thromboembolism in adults at a tertiary university hospital, overall and by surgical specialty. The secondary objective was to analyze severity of and mortality from thromboembolic events.

Methods: We performed a retrospective study to identify cases of in-hospital postoperative venous thromboembolism, encoded by the International Classification of Diseases, Ninth Revision, according to the Joint Commission International criteria. Adult patients admitted for surgery in 2008-2012 were included.

Results: Among 67 635 hospitalizations, 90 cases of postoperative symptomatic venous thromboembolism were identified (median age 59 years), corresponding to an incidence of 1.33/1000 admissions (95% confidence interval [CI] 1.1-1.6/1000). Neurosurgery had the highest risk (4.07/1000), followed by urological surgery and general surgery ($p < 0.001$). There were 50 cases of pulmonary embolism, 11 of which were fatal. Of the 90 cases, 12.2% occurred under neuraxial anesthesia and 55.1% in patients with American Society of Anesthesiology III physical status. At least 37.7% of patients with events received a prophylactic dose of injectable anticoagulant postoperatively. The overall risk decreased from 2008 to 2012. Venous thromboembolism-associated mortality during hospitalization was 21.1% (95% CI 13.6-30.4).

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PALAVRAS-CHAVE

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Conclusions: The incidence of postoperative symptomatic venous thromboembolism was 1.33/1000. Neurosurgery showed the greatest risk. Mortality was 21.1%.

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Estudo TRomboEmbolismo Venoso pós-Operatório (TREVO) – risco e mortalidade por especialidade cirúrgica

Resumo

Introdução e objetivos: O tromboembolismo venoso, cujo risco está aumentado no doente cirúrgico, é uma causa evitável de morbimortalidade. O objetivo primário deste estudo foi estimar o risco de tromboembolismo venoso sintomático pós-operatório global e por especialidade cirúrgica, num hospital terciário. Secundariamente, foram analisadas a gravidade e mortalidade dos eventos tromboembólicos.

Métodos: Foi realizado um estudo retrospectivo para a identificação de casos de tromboembolismo venoso pós-operatório intra-hospitalar, codificados pela Classificação Internacional de Doenças – 9.^a revisão, pelos critérios da *Joint Commission International*. Foram incluídos episódios de internamento de doentes adultos, operados, no período 2008-2012.

Resultados: Em 67 635 episódios de internamento com cirurgia identificaram-se 90 casos de tromboembolismo venoso pós-operatório (mediana de idades: 59 anos), correspondendo a um risco de 1,33/1000 episódios (intervalo de confiança a 95% [IC95%], 1,1-1,6/1000). A neurocirurgia apresentou maior risco (4,07/1000), seguida pela urologia e pela cirurgia geral $p < 0,001$. Houve 50 episódios de embolia pulmonar, dos quais 11 foram fatais. Dos 90 casos, 12,2% decorreram sob anestesia do neuro-eixo e 55,1% em doentes com estado físico ASA III. Foi administrada dose profilática de anticoagulante injetável no pós-operatório a, pelo menos, 37,7% dos doentes. O risco decresceu de 2008 até 2012. A mortalidade associada aos eventos de tromboembolismo venoso durante o internamento foi 21,1% (IC95%, 13,6-30,4).

Conclusões: O risco de tromboembolismo venoso sintomático pós-operatório foi de 1,33/1000. A neurocirurgia apresentou maior risco. A mortalidade foi de 21,1%.

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Introduction

Venous thromboembolism (VTE), which includes deep vein thrombosis (DVT) and pulmonary embolism (PE), is a leading cause of morbidity and mortality and results in high financial costs, and is considered a major public health problem. The estimated annual incidence rates of VTE range between 104 and 183/100 000 person-years¹; early mortality is 12.6% and five-year mortality is 50-60% for PE and 25% for DVT.²

It is difficult to obtain reliable and comparable estimates of VTE incidence, for various reasons. Symptoms and clinical signs are non-specific, and hence only 50% of cases are diagnosed and the predictive value of screening asymptomatic patients is low.³ These factors help explain the variations seen in epidemiological data from different studies, although there are also differences related to ethnicity.¹

Surgical patients are at increased risk for VTE, which in the absence of thromboprophylaxis ranges between 15% and 60% depending on the type of surgery; it is highest in major orthopedic procedures.^{4,5} Individual patient characteristics, type of anesthesia, and length of procedure and hospital stay also affect risk.^{4,5}

The ENDORSE study,⁶ which analyzed VTE risk in 32 countries, showed that of the 762 surgical patients assessed in Portugal, 69% were at risk. Despite the importance of awareness of outcome indicators, there have been few epidemiological studies on postoperative VTE in Portugal.

Objectives

The primary objective of the postoperative venous thromboembolism (TREVO) study was to estimate the incidence of symptomatic postoperative VTE, overall and by surgical specialty, at a tertiary hospital. The secondary objective was to analyze severity of and mortality from thromboembolic events, including the characteristics of the patients involved and their treatment.

Methods

TREVO is a retrospective epidemiological study of an adult population of surgical patients at Centro Hospitalar de São

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