Venous thromboembolism after severe trauma: Incidence, risk factors and outcome

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A R T I C L E   I N F O

Article history:
Accepted 11 June 2009

Keywords:
Venous thromboembolism
Deep vein thrombosis
Pulmonary embolism
Trauma
Risk factors
Outcome

A B S T R A C T

Background: Venous thromboembolic events (VTEs) are common life-threatening complications after trauma, but epidemiology and reported risk factors still vary. The purpose of this investigation was to determine the incidence of VTEs among hospitalised trauma patients, to identify potential risk factors and to assess whether their presence was associated with: (a) the magnitude and pattern of injury, (b) therapeutic interventions and (c) outcome, all by using a large population-based registry.

Patients and methods: Patient data from the Trauma Registry of the German Society for Trauma Surgery (TR-DGU) including datasets from more than 35,000 trauma patients were screened for all clinically relevant VTEs, i.e. deep vein thrombosis (DVT) and pulmonary embolism (PE). A total of 7937 patients were identified for further investigation and multivariate logistic regression analyses were performed to assess potential risk factors for VTEs and to evaluate the effect of VTEs on outcome.

Results: One hundred forty-six of 7937 patients developed clinically relevant VTEs during post-traumatic hospitalisation corresponding to an overall incidence rate of 1.8%. Two-thirds (97/146) of all VTEs occurred during the first 3 weeks after admission.

At the time point of the event 118/146 (80.8%) patients were under either mechanical or chemical prophylaxis. Multivariate analysis with VTE as dependent variable identified injury severity score, the number of operative procedures, pelvic injury (abbreviated injury scale ≥ 2) and concomitant diseases (i.e. diabetes, renal failure, malignancies and congenital or acquired coagulation disorders) as independent risk factors. The presence of VTEs was associated with higher frequencies of sepsis (25% vs. 9.1%), single (63.6% vs. 41.3%) and multiple organ failure (49% vs. 25%) and prolonged in-hospital length of stay (52 ± 34 days vs. 29 ± 30 days; all p < 0.001). The mortality in the VTE group totaled 13.7% vs. 7.4% in the non-VTE group (p = 0.004). The presence of PE was associated with a mortality rate of 25.7%. The adjusted odds ratio of post-traumatic VTEs for hospital mortality was 2.08 (CI95 1.15–3.78; p = 0.016).

Conclusion: The occurrence of clinically apparent VTEs during post-traumatic hospitalisation is low but associated with increased morbidity and mortality. Conclusions about the effectiveness of different thromboprophylactic measures could not be drawn, since detailed information was not recorded. However, 80.8% of VTE patients had received thromboprophylaxis at the time point of the event.

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Introduction

Venous thromboembolic events (VTEs) comprise deep vein thrombosis (DVT) and pulmonary embolism (PE) and represent a significant cause of death, disability and discomfort after trauma-associated hospitalisation. While DVT may present clinically silent, PE is the third most common cause of death in patients that survive the first 24 h after trauma. The information on the frequency of VTEs among hospitalised patients after trauma varies widely, ranging from less than 1% up to 58% depending upon the demographics of the study population, the nature of the injuries and other factors. The increased survival of severely injured patients together with the aging population may implicate an increasing risk of VTEs after trauma.