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Venous thromboembolism prophylaxis in medical ICU patients in Asia (VOICE Asia): A multicenter, observational, cross-sectional study

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ABSTRACT

Objectives: The VOICE Asia study aimed to establish the mode of thromboprophylaxis in medical patients admitted to intensive care units (ICU), and to describe the epidemiology of patients at high-risk of venous thromboembolism (VTE) and of patients who were prescribed low molecular weight heparin (LMWH).
Methods: This multinational, observational, cross-sectional study recruited medical patients admitted to ICU in whom a decision to give VTE prophylaxis had been taken. The treating physicians decided patient management. We recorded demographics, VTE risk factors, VTE risk assessment, thromboprophylaxis, and compliance to the American College of Chest Physicians (ACCP) guidelines.
Results: The study enrolled 2969 patients from 113 centers in 5 Asian countries. The most common VTE risk factors were age >60 years (57.1%), prolonged immobility (50.6%), respiratory diseases (41.3%), and acute infectious disease (36.2%). There was a wide gap between physicians' assessment of 'very high' risk for VTE (8.4%) and Caprini 'very high' risk stratification (54.9%). 2919 (98.3%) patients received prophylaxis (22.9%-only mechanical, 31.2%-only pharmacological, 44.2%-both, mechanical and pharmacological and 1.7%- no prophylaxis). Early mobilization (44.3%) and LMWH (66.2%, mean duration of prophylaxis-8.6 days) were the most common mechanical and pharmacological prophylaxis, respectively. 80.6% of patients were given thromboprophylaxis as per the ACCP guidelines (and 4.7% per Japanese guidelines).
Conclusions: There is substantial underestimation of VTE risk and non-adherence to guidelines for thromboprophylaxis in medical ICU patients in participating Asian countries. This emphasizes the need for increasing awareness about optimum VTE risk assessment and improved implementation of appropriate thromboprophylaxis in at-risk medical ICU patients.

Introduction

Venous thromboembolism (VTE) is a global health concern with substantial morbidity and mortality [1,2]. Approximately 30% of patients with symptomatic VTE manifest pulmonary embolism, whereas others manifest deep vein thrombosis (DVT) [3]. The incidence of VTE in Asian populations has been a moot point in the last few years. While some researchers believe VTE to be rare in Asians [4], others have shown that this incidence is not only growing [5–8] but is also comparable to that in Western countries [9]. Cohen, et al., have argued that this disparity is probably because of assessment techniques and diagnostic methods in the Western studies and a smaller population evaluated thus far in Asian studies [10].

VTE events are a relatively common cause of death in hospitalized patients [11,12]. Almost 75% of all VTE-related deaths are from hospital-acquired VTE [8]. Although VTE is often thought to be associated with recent surgery or trauma, 50% to 70% of symptomatic thromboembolic events and 70% to 80% of fatal pulmonary embolisms occur in

Abbreviations: ACCP, American College of Chest Physicians; DCF, data collection form; DVT, deep vein thrombosis; GS/ES, graduated stockings/elastic stockings; ICU, intensive care unit; IPC, intermittent pneumatic compression; IV, intravenous; LMWH, low molecular weight heparin; MI, myocardial infarction; NYHA, New York Heart Association; SD, standard deviation; VTE, venous thromboembolism.

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nonsurgical patients [13,14]. Hospitalization for an acute medical illness accounts for around 22% of all symptomatic VTE events in the general population [15].

Earlier evidence suggests that the risk of hospital-acquired VTEs can be reduced given the availability of effective prophylaxis [16–19]. Available guidelines – including the Eighth American College of Chest Physicians (ACCP) Conference on Antithrombotic and Thrombolytic Therapy: Evidence-Based Guidelines (ACCP guidelines) [20], and the International Consensus Statement [21] – help in the assessment of risk factors for VTE and recommend the appropriate use of prophylaxis to prevent VTE in patients at risk. VTE risk is assessed effectively using Caprini risk assessment tool. Despite the availability of guidelines for thromboprophylaxis in medical patients since 1986, studies suggest under-use or misuse of thromboprophylaxis in these patients [22–26]. Also in the absence of guidelines for treatment and prevention of VTE in critically ill patients [27], the administration of VTE prophylaxis in this setting is mostly based on subjective clinical judgment.

Hence, it is important to adopt measures to improve current practice for risk assessment and prevention of VTE in hospitalized medical patients. As the incidence of VTE has been confirmed to be common in Asian populations, there is an increasing need to use appropriate prophylaxis. However, little is known about use of thromboprophylaxis in medical patients at risk of VTE in Asia. We therefore conducted a multinational, observational, cross-sectional study, "VTE Prophylaxis in ICU Patients in Asia (VOICE Asia)", in medical patients admitted to intensive care units (ICUs). The objectives of this study were to evaluate current VTE prophylaxis, to describe the epidemiology of high-risk patients, and to characterise patients to whom low molecular weight heparin (LMWH) had been prescribed.

Methods

Study design

This was a multinational, observational, cross-sectional study of medical patients admitted to ICUs in five Asian countries: Indonesia, India, Korea, Pakistan, and Thailand. The participating physicians were free to use any modality of prophylaxis, mechanical and/or pharmacological according to their usual clinical practices.

Patients

Eligibility criteria included medical patients aged 18 years or above who were admitted to the ICU, and in whom the decision to give VTE prophylaxis had already been taken. The patients (or their authorized legal representatives) signed the data release consent form. Exclusion criteria included patients admitted to ICUs after undergoing any major surgical intervention or who received unfractionated heparin, LMWH or oral anticoagulants for treatment purposes (not prophylaxis).

Study objectives

The primary objective was to establish the mode of VTE prophylaxis in medical patients admitted to ICU. The secondary objectives were 1) to describe the epidemiology of patients at high risk of VTE, requiring VTE prophylaxis as assessed by the participating physicians, and 2) to identify characteristics of patients for whom the decision to offer prophylaxis with LMWH had already been made.

Study assessments

Patients' data were collected using data collection forms (DCFs) in a single visit, on the day of enrolment. The DCF captured detailed information regarding demographic, epidemiological and medical data (age, gender, weight, mobility, abnormal coagulation, renal disorders, and procedure-related information), VTE risk factors, VTE risk assessment as assessed by physicians and Caprini risk stratification [28], type and duration of thromboprophylaxis, and physician-reported compliance with the ACCP guidelines.

According to Caprini risk factor assessment [28], VTE risk factors are divided into four groups with an additional group for risk factors for women only. The risk factors in each of these groups are assigned 1, 2, 3, 5, and 1 points. We calculated the total risk factor score for each patient. The Caprini risk levels are assigned according to the total risk factor score as follows: low risk (total score: 0–1), moderate risk (total score: 2), high risk (total score: 3–4), and highest risk (total score: ≥ 5).

Statistical analysis

Data were summarized using mean, standard deviation and range for continuous parameters and counts and percentages for categorical parameters. Descriptive analyses were performed.

Results

Patients

Between August 2006 and July 2007, a total of 2969 patients were enrolled in the study from India (62.9%), Indonesia (6.8%), Korea (20.5%), Pakistan (3.3%), and Thailand (6.5%). There were 113 participating centers: India (90), Indonesia (1), Korea (4), Pakistan (10), and Thailand (8). The baseline demographics and characteristics of the enrolled patients are presented in Table 1. About 62.0% of the patients were male. The mean age $\pm$ SD of the patients was 60.4 $\pm$ 15.5 years. 59.1% of patients were 60 years of age or above. Majority of the patients (82.4%) were immobilized (complete bed rest) for a mean duration of 7.1 days. Table 2 presents data on the risk factors for VTE. Older age >60 years (57.1%) was the most frequently specified risk factor, followed by prolonged immobility (50.6%), respiratory diseases (41.3%), and acute infectious disease (36.2%). Only 1.6% of patients had a history of VTE. 59.5% of patients had ≥ 3 VTE risk factors.

Table 3 compares the VTE risk stratification when assessed by the study physicians and the Caprini scores. Physicians underestimated the risk in 73.1% of cases and in 23.0% the magnitude of this underestimation was by at least 2 points on the scale i.e. assessed as 'low' when it was 'high' or 'very high' or assessed as 'moderate' when it was 'very high'. Also, physicians classified only 8.4% of patients with 'very high' risk, while those indicated by Caprini stratification were 54.9%.

A total of 2919 (98.3%) patients received thromboprophylaxis: : pharmacological - 2238 (75.4%), mechanical - 1993 (67.1%), and both - 1312 (44.2%) (Table 4a). 31.2% and 681 (22.9%) of patients received only pharmacological and only mechanical prophylaxis, respectively. Early mobilization was the most commonly used mechanical prophylaxis, and LMWH was the most commonly used pharmacological prophylaxis. The most common prophylaxis in 'high' and 'very high' risk patients was combination of mechanical and pharmacological prophylaxis. In patients having active cancer, only 14.2% of patients received only pharmacological prophylaxis, 62.84% received only mechanical prophylaxis, and 22.30% received both. The most common reasons for not giving pharmacological prophylaxis (and hence for prescribing mechanical prophylaxis) were concern of bleeding (52.1%), low risk of VTE (27.6%) and early mobilization (10.3%). Among 2238 patients who received pharmacological thromboprophylaxis, the main reasons for prescribing drugs were to prevent thrombosis (30.2%), co-morbid conditions (25.2%), and high risk of VTE (19.4%).