Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ihj

Original Article

Prevalence of venous thromboembolism risk factors and prophylactic adequacy among general surgical patients in a tertiary care hospital

Abin Chandrakumar [a,*], *A.M. Muhammed Sajid* [b], *T.N.K. Suriyaprakash* [c], *K.K. Ajmal* [a]

[a] *Department of Pharmacy Practice, Al Shifa College of Pharmacy, Poonthavanam, Kizhattur P.O., Perinthalmanna, Kerala 679325, India*

[b] *Department of General & Laparoscopic Surgery, KIMS Al Shifa Hospital Pvt. Ltd., Perinthalmanna, Kerala 679322, India*

[c] *Department of Pharmaceutics, Al Shifa College of Pharmacy, Poonthavanam, Kizhattur P.O., Perinthalmanna, Kerala 679325, India*

ARTICLE INFO

Article history:
Received 24 October 2015
Accepted 2 December 2015
Available online 12 January 2016

Keywords:
Venous thromboembolism
Risk factors
Caprini score
Bleeding risk
Prophylaxis

ABSTRACT

Introduction: Venous thromboembolism (VTE) is a disease manifested as deep vein thrombosis and pulmonary embolism. General surgical procedures are associated with significant risk of precipitating VTE, and despite the surging evidences, it is often overlooked. The study attempted at estimating the prevalence of VTE and bleeding risk factors coupled with the adequacy of thromboprophylaxis administered.

Methodology: The study spanning 1-year duration was executed through collection of data from patients older than 18 years, admitted to the general surgery department of a tertiary care hospital. The data were collected using internally validated data collection form and the appraisal of data was done using SPSS 18.

Results: Among the 400 subjects enrolled, number of patients in low, moderate, and high risk, as per the Caprini score, was 24%, 35%, and 41%, respectively, with the difference being significant with $p < 0.001$. Bleeding risk was positive in 28% subjects and 36% received any form of prophylaxis other than early ambulation. 28% subjects were identified to have received adequate thromboprophylaxis.

Conclusion: Although the prevalence of 41% individuals at high risk for VTE is comparable to the global prevalence of 41.5%, prophylactic adequacy of 28% was lower than the 33% observed globally. Meticulous planning coupled with operational interventions, such as institutional multidisciplinary thromboprophylactic team, can be an effective strategy at enhancing the prophylactic standards and thereby attaining optimal patient outcomes.

* *Corresponding author.*
E-mail address: abinchandrakumar@gmail.com (A. Chandrakumar).

http://dx.doi.org/10.1016/j.ihj.2015.12.003

1. Introduction

Thrombus comprising of platelets and fibrin is the terminal consequence of the blood coagulation pathway and helps perpetuate hemostasis. Despite its beneficial effect, it has the potential to dislodge from the site of injury and occlude blood vessels in other areas, producing a paradoxical effect.[1] Venous thromboembolism (VTE) is a disease that encompasses deep vein thrombosis (DVT) and pulmonary embolism (PE). With aptitude to produce significant morbidity and mortality, they jointly pose a global health concern. Oftentimes, VTE remains asymptomatic and underdiagnosed, culminating in chronic complications and truncated survival.

VTE is precipitated by several factors and humanity's comprehension on its probable association with surgical procedure is not novel. The patient at highest risk involves those undergoing major orthopedic procedures, where 50–60% patients have propensity to develop DVT.[2] Although the prophylaxis in orthopedic procedures is given due importance, risk associated with general surgical procedures has been consistently downgraded across the globe. A patient undergoing major surgical procedure has 20-fold risk enhancement for VTE and the risk is increased by 30% when there is absence of optimal prophylaxis.[3] The risk associated with VTE in general surgery varies between 10 and 50% depending on the type of surgery and patient risk factors.[4] Accurate estimation of thromboembolic risk is therefore quintessential and attempts have been made since 1970s for fabrication of several risk assessment models (RAMs) based on clinical and laboratory parameters. Despite profuse RAMs available, none provided a comprehensive guidance covering all patient groups.[5]

The increasing number of evidences accumulated through meta-analysis studies has led to the development of American College of Chest Physician (ACCP) 9th antithrombotic guidelines in 2013, which unlike its predecessor of 2008 has distinctively emphasized the relevance of risk stratification by addressing nonorthopedic surgical thromboprophylaxis in a separate section.[6,7] The guideline advocates the use of Caprini score[8] as an effective RAM to appraise individualized risk in general surgical candidates. Although it was not devised using meticulous statistical procedures, it is relatively easy to use and has been successful in discriminating different tiers of risk among surgical patients. It has also been validated using a large retrospective study comprising sample of general, vascular, and urological surgery patients.[9] However, Caprini score has not been adequately validated in gynecological surgery subjects and the application of the same to this specific subgroup is unsubstantiated.

Although several studies have attempted to outline the distribution of VTE risk in surgical patients, very few have addressed the general surgical patients specifically. Estimation of prevalence of VTE and bleeding risk factors can assist healthcare practitioners contemplate on relevant issues with thromboprophylaxis in the specific population and meticulously plan strategies to tackle the same. The following study was aimed at assessing various VTE and bleeding risk factors prevalent in the population and the adequacy of prophylaxis provided in relevance to the ACCP 9th antithrombotic guidelines.

2. Materials and methods

The study spanning 1 year was carried out in the general surgical department of a private tertiary care hospital in Kerala. This cross-sectional study was conducted from February 2014 to January 2015 and enrolled subjects greater than 18 years of age, undergoing those surgical procedures, which are necessitated with inpatient admission. Pregnant patients, patients of non-Indian origin, those admitted solely for VTE treatment, or operated under local anesthesia were excluded from the study. Most of the local anesthesia procedures did not require admission and were performed on a day care basis. Ethical approval was obtained through written consent from the institutional ethical committee prior to enrollment of the first subject. Verbal as well as written consent was obtained either from the patients or relatives after duly informing them of the various aspects as mandated in the ICMR ethical guidelines.[10] A total of 400 subjects were enrolled during the study period and their demographics along with surgical data were collected using an internally validated data collection form. Caprini score was utilized for stratifying the patients into low-, moderate-, and high-risk groups.[8] Conditions, such as age 41–60 years, swollen legs, varicose veins, minor surgery, sepsis <1 month ago, history of inflammatory bowel disease, prior major surgery, abnormal pulmonary function, obesity (defined as BMI $>$ 25 kg/m^2), and other comorbidities (diabetes, hypertension, coronary artery disease, dyslipidemia), if present, were assigned 1 point each. 2 points were assigned for the presence of each of these conditions: age 61–74 years, laparoscopic surgery, major surgery ($>$45 min duration), history or presence of malignancy, bed confinement $>$3 days, and central venous access. Age $>$75 years and history of DVT were used to assign 3 points if present. Similarly, multiple trauma and lower limb fractures were assigned 5 points. The overall VTE risk score was assigned to each patient and was estimated through summation of the individual points assigned on the basis of presence of any of these mentioned conditions.

Conditions, such as active bleeding, prior major bleeding, known or untreated bleeding disorders, severe renal or hepatic failure, thrombocytopenia, acute stroke, uncontrolled systemic hypertension, concomitant use of anticoagulants, antiplatelet therapy, or thrombolytic drugs, were considered as risk factors for bleeding, as per the ACCP recommendations. Presence of these conditions was assumed as contraindications to administration of pharmacological prophylaxis. The thromboprophylactic therapy administered to each patient was scrutinized and compared against this guideline to estimate the compliance. The recommendations used for appraising the prophylactic compliance, as per the ACCP guidelines, have been summarized in Table 1. Statistical analysis of the data was performed using SPSS 18.0 and the results were interpreted in terms of p-value with level of significance set at 0.05.

3. Results

An aggregate of 400 patients who met the predetermined criteria were enrolled in the study. Among the total sample,