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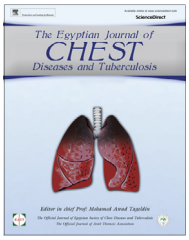

ORIGINAL ARTICLE

Thromboprophylaxis does not prevent venous thromboembolism after major surgery

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KEYWORDS

Thromboprophylaxis;
Pulmonary embolism;
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Abstract Pulmonary embolism (PE) is a life-threatening condition or complication and might be one of the worst nightmares for most surgeons.

The aim of this study was to evaluate the incidence of venous thrombo-embolism (VTE) in patients undergoing major abdominal surgery and major orthopedic surgery who received VTE prophylaxis.

Methods: Between January of 2010 and September of 2013 all the patients who underwent major abdominal surgery and major orthopedic surgery who received VTE prophylaxis, at King Fahad Hospital Dammam Kingdom of Saudi Arabia, were prospectively evaluated for the incidence of DVT and PE within 30 postoperative days.

Results: The incidence of symptomatic DVT and PE in the patients studied was 2.23% and 2.03%, respectively. The incidences of PE and DVT following abdominal surgery were 2.44%, and the incidences of PE and DVT following orthopedic surgery were 1.62% and 2.03%, respectively.

Conclusion: Despite the use of thromboprophylaxis, PE and DVT were important complications of major abdominal and major orthopedic surgery.

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Introduction

Pulmonary embolism (PE) is a life-threatening condition or complication and might be one of the worst nightmares for most surgeons. The embolus that causes the obstruction usually travels through the venous system from a distant site. PE causes symptoms such as dyspnea, chest pain or collapse. Moreover, the clinical severity of PE can vary, ranging from asymptomatic cases to sudden death. Despite advances in diagnosis and treatment, PE remains a significant cause of morbidity and mortality and is still one of the most common preventable causes of death, which is easily overlooked [1,2]. Risk factors for deep vein thrombosis (DVT) and PE are prior

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medical history of DVT or PE, recent surgery, general anesthesia lasting longer than 30 min, pregnancy, prolonged immobilization, age >40 years, obesity or underlying malignancy [3,4]. Moreover, gynecologic surgery, major trauma and indwelling venous catheters are risk factors for DVT at any location. Otherwise, venous thrombosis commonly involves lower limbs, affecting most frequently calf veins, which are involved in virtually 100% of symptomatic, spontaneous lower extremity DVT. Although DVT usually starts in calf veins, it is propagated above the knee in 87% of symptomatic patients before the diagnosis has been made. However, more than 35% of patients who die from PE may have isolated calf vein thrombosis [5]. Because perioperative VTE is asymptomatic in the majority of the cases (95%), this important clinical condition might be underestimated by surgeons, resulting in inadequate use of prophylactic anticoagulants [6].

The aim of this study was to evaluate the incidence of venous thromboembolism (VTE) in patients undergoing major abdominal surgery and major orthopedic surgery who received VTE prophylaxis.

Methods and subjects

The study was approved by the King Fahad Hospital Ethics and Research committee. Between January of 2010 and September of 2013 all the patients who underwent major abdominal surgery (bariatric surgery, Whipple operation, colorectal surgery, nephrectomy, splenectomy) and major orthopedic surgery (hip arthroplasty, knee arthroplasty, or femur fracture repair), were included in the study (Table 1). 493 patients who had been referred to the Orthopedics and General Surgery Departments of the King Fahad Hospital Dammam Kingdom of Saudi Arabia, and submitted to surgery were prospectively studied and evaluated for the incidence of DVT and PE within 30 postoperative days. The departments had a standard protocol for thromboprophylaxis (enoxaparin 40 mg/day s.c., and the use of graded compression stockings). This protocol was used during the period of the study. Patients who underwent major abdominal surgery and major orthopedic surgery in the hospital were routinely followed on postoperative day 14, and 30 after had discharged 7 days postoperative. Patients who had respiratory symptoms (pleuritic chest pain, dyspnea, hemoptysis, or cough), with or without signs and symptoms consistent with DVT (swelling, pain, tenderness, increase in the diameter of lower limbs, or local heat), were referred and evaluated by a pulmonologist as a consultation. Patients suspected of having VTE were submitted to chest CT angiography and Doppler ultrasound of the lower extremities by an expert radiologist. Chest CT angiography was performed with a 16-section multidetector CT scanner (LightSpeed 16; GE Healthcare, Milwaukee, WI, USA) within 24 h. PE was diagnosed when an intraluminal filling defect surrounded by intravascular contrast or total occlusion of the pulmonary arterial lumen was detected at any level of the pulmonary arteries. Doppler ultrasound of the deep veins of the lower extremities was performed with a standard method using a dedicated ultrasound unit (LOGIQ 7; GE Healthcare) with a 10 L linear array transducer (bandwidth, 6–10 MHz) in order to investigate the presence/absence of intravenous thrombi. Data on the type of surgical procedure, the type and duration of anesthesia, and other potential risk factors for VTE, including obesity, immobility (bed rest >48 h), malignancy, previous history of VTE, COPD, smoking, congestive heart failure, trauma, thrombocytosis, and history of hormone replacement, were also recorded (Table 2). In addition, the time of initiation and the duration of thromboprophylaxis were collected.

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences for Windows, version 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistical analysis results were presented as absolute and relative frequencies. Differences between groups for categorical variables were analyzed using the chi-square test or Fisher's exact test, where appropriate. The three clinically important variables among those which were found significantly effective in the development of VTE in the univariate analysis were evaluated by multiple logistic regression analysis in order to define independent risk factors of outcome variables.

Table 1 Demographic data, type of surgery, and incidence of PE and DVT in the patients included in the study.

Variable	Result	PE (N = 10)	DVT (N = 11)
Age	64.46 ± 19.12		
Gender			
Male	229 (46.45%)	4 (40%)	4(36.36%)
Female	264 (53.55%)	6 (60%)	7(63.63%)
Type of surgery			
Abdominal surgery	246 (49.89)	6 (60%)	6 (54.55%)
Orthopedic surgery	247 (50.11)	4 (40%)	5 (45.45%)
Bariatric surgery	35 (7.10%)	1 (10%)	1 (9.09%)
Whipple operation	99 (20.08%)	2 (20%)	2 (18.18%)
Colorectal surgery	83 (16.84%)	3 (30%)	3 (27.27%)
Splenectomy	6 (1.21%)	0	0
Nephrectomy	6 (1.21%)	0	0
Knee arthroplasty	94 (19.07%)	0	0
Hip arthroplasty	67 (13.59%)	1 (10%)	1 (9.09%)
Femur fracture repair	86 (17.44%)	3 (30%)	4 (36.37%)

PE: Pulmonary Embolism, DVT: Deep Venous Thrombosis.

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