Incidence and Risk Factors of Venous Thromboembolism Following Major Abdominal Surgery

Sitthichai Vachirasrisirikul MD*,
Kamphol Laohapensang MD, FACS*

** Division of Vascular and Endovascular Surgery, Department of Surgery, Faculty of Medicine, Chiang Mai University Hospital, Chiang Mai, Thailand*

Objective: *Venous thromboembolism (VTE) has been recognized as a common surgical complication in Western populations more than in Asian populations. Guidelines recommend the routine use of pharmacological prophylaxis for high-risk general surgical patients to prevent VTE. However, the necessity of routine pharmacological prophylaxis for major abdominal surgery in Thai patients has not been clearly determined. The purpose of the study was to determine the incidence and risk factors of VTE in Thai patients undergoing major abdominal surgery.*

Material and Method: *A prospective cohort study was conducted between January and September 2014 in our institution. One hundred sixty seven patients that underwent major abdominal operation were analyzed. For the diagnosis of deep vein thrombosis (DVT), a duplex Doppler ultrasonography was performed in all patients five to seven days following surgery and in patients suspected of DVT until four weeks after surgery. CT angiography of pulmonary vasculature was carried out in patients suspected of pulmonary thromboembolism (PE). All patients were divided into two groups, non-VTE and VTE groups. The Student t-test was used to compare all continuous variables between both groups. Fisher's exact test was used to compare all categorical variables. The risk factors of VTE were identified by stepwise backward regression analysis and reported with risk ratio (RR) and 95% confidence interval (CI). A p-value of <0.05 was regarded as statistically significant.*

Results: *VTE was diagnosed in six patients (an incidence of 3.6%, 95% CI 3.39-3.81), three patients for proximal DVT (1.8%) and three patients for PE (1.8%). All cases were symptomatic. By multivariable analysis, risk factors of VTE could not be identified. However, higher BMI and postoperative longer rest on bed trended to increase the risk for VTE.*

Conclusion: *The incidence of VTE in Thai patients that underwent major abdominal operation is low (3.6%), even in the context of risk factors typically regarded as high risk. Further studies into this area are warranted, especially well-designed large studies to develop an accurate risk stratification model specific for the Asian population.*

Keywords: *Venous thromboembolism, Incidence, Major abdominal surgery, Prophylaxis*

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Venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE), is regarded as a major public health problem in Western countries[1]. The overall incidence of VTE in patients undergoing general surgery without thromboprophylaxis is approximately 15 to 30% in the Western countries[2]. In contrast, VTE is less common in Asian populations, particularly in the Far East[3]. However, in recent studies, there is some contradicting information concerning the incidence of VTE after major abdominal surgery in Asian countries. Some recent studies have demonstrated higher rate of VTE after major abdominal surgery, approaching those observed in Western populations[4-6], but some reports rarely found VTE when compared to Western population[7-10].

Though most authors still regard venography as the gold standard for diagnosis, duplex ultrasonography (DUS) has a very high sensitivity (97%) and specificity (94%) for proximal DVT[11] but less accuracy for distal DVT. The American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (ACCP) ninth edition recommended using duplex ultrasonography for diagnosis of DVT[12].

ACCP guidelines recommend the routine use of pharmacologic thromboprophylaxis for high-risk general and abdominal-pelvic surgery patients to prevent VTE. However, the necessity of routine pharmacologic thromboprophylaxis for major abdominal surgery in Thai patients has not been clearly determined.

The primary objective of the present prospective observational study was to investigate

Correspondence to:
Vachirasrisirikul S, Division of Vascular Surgery, Department of Surgery, Buddhachinaraj Hospital, 90 Srithamtripidok Road, Tumbol Nai Muang, Amphoe Mueang, Phitsanulok 65000, Thailand.
Phone: +66-55-270300
E-mail: sittichai.va@hotmail.com

the incidence and risk factors of VTE in patients undergoing major abdominal surgery.

Material and Method

Study design

A prospective observational study was conducted between January 2014 and September 2014 on the general surgical in-patients of Chiang Mai University Hospital to study the incidence and risk factors of VTE in Thai patients undergoing major abdominal surgery.

Patients' demographics were collected before the operation. Clinical laboratory tests were conducted within the 10 days before surgery. Surgical factors such as operative procedures, operative time, and intraoperative blood transfusion were collected. Postoperatively, duration of immobilization, Caprini score were also collected.

The study was reviewed and approved by the Research Ethic Committee, Faculty of Medicine, Chiang Mai University, Thailand. Written informed consent was obtained from all the participants.

Patient population

The inclusion criteria were open and/or laparoscopic major abdominal surgery in which the length of operation is expected to be more than 45 minutes[13], being 18 years or older, hospitalized more than four days after operation, and did not receive mechanical or pharmacologic thromboprophylaxis. The exclusion criteria were concurrent VTE before surgery or evidence of DVT on preoperative duplex scan (DS), history of VTE, a known hypercoagulable state or congenital thrombophilia, history of taking antiplatelet or anticoagulant agents within two days prior to the operation, comorbidities that required anticoagulation during the perioperative period (i.e., atrial fibrillation), trauma-related surgery, vascular, gynecological, and urological surgery, and pregnancy.

Diagnosis of DVT and PE

In the prospective cohort, all patients underwent duplex ultrasonography (DUS) on lower extremities between five and seven days following major abdominal surgery to screen for DVT regardless of postoperative symptom development. The author performed the DUS under the supervision of the radiologist. All imaging was performed using a 7.5 MHz linear transducer (NemioMX MODEL SSA-590A; TOSHIBA, CMC BIOTECH CO., LTD., Bangkok, Thailand) from the distal 2 to 3 cm of the external iliac vein to the distal calf veins. Each patient was scanned in the supine position. The distal external iliac vein, common femoral vein (CFV), femoral vein were imaged. The patient was then placed in a decubitus or sitting position, and the popliteal, soleus, peroneal and tibial veins were imaged. DUS included imaging in the transverse and longitudinal planes using both gray-scale and color DUS.

DVT was defined when the following conditions were seen, echogenic material within lumen, un-compressible vein, or non-visualized flow in color Doppler imaging[14]. To check for non-compressibility the deep vein was evaluated at 1 cm intervals from the CFV to the calf veins. The flow augmentation produced by upstream calf compression was performed in case that deep vein could not compress. The augmentation also helped to assess for obstruction distal to the probe. The respiratory phasicity was also assessed to evaluate iliac vein or inferior vena cava (IVC) patency.

Whenever DVT-related symptoms were clinically suspected, the study protocol guided that a DUS for lower extremities should be conducted.

Likewise, when symptoms suspicious of PE were noted, computed tomography (CT) pulmonary angiography was carried out immediately to confirm the presence of the thrombi in the pulmonary artery. If VTE was confirmed, appropriate treatment was instituted.

After the patients discharged from the hospital, the data on VTE development were retrospectively collected from an electronic medical chart review four weeks following surgery.

Statistical analysis

The patients were divided into two groups, non-VTE, and VTE group. Non-VTE group referred to patients who had no postoperative VTE, both in clinical presentation and ultrasonography. The VTE group referred to patients who were diagnosed VTE from ultrasonography or CT pulmonary angiography. The primary objective was to identify the incidence of symptomatic or asymptomatic VTE following major abdominal surgery. The incidence of postoperative VTE was defined as the cases detected by routine DS (five to seven days after surgery) plus any additional VTE cases detected by DUS or computed tomography angiography (CTA) (until four weeks after surgery). The secondary objective was to identify risk factors for development of VTE in this population. The

planned sample size for the study was 172 patients. This was based on the assumption that the incidence of postoperative VTE was 11.4%[8], used power of 80% and 95% confidence interval (CI) (two-sided), and that the rate of exclusion from the analysis would be estimated in 10% of the cases. The incidence and the associated 95% CI (two-sided) of VTE were calculated, respectively. The Student t-test was used to compare all continuous variables between both groups depending on data distribution. Fisher's exact test was used to compare all categorical variables between two groups. All factors whose *p*-value was less than 0.2 from univariable analysis and well-known clinically significant factors such as age, gender, and malignancy were included in multivariate analysis model. These factors were identified by Stepwise Backward Regression Analysis and reported with risk ratio (RR) and 95% CI. A *p*-value of <0.05 was regarded as statistically significant. All statistical analyses were performed using Commercial statistical software STATA version 11.0 (STATA Corp., CS, USA).

Results

Patient characteristics of study population

One hundred seventy six patients undergoing major abdominal surgical operation were enrolled in the present study. Nine patients were excluded from the analysis. The remaining 167 patients were subjected to the analysis as the study population (Fig. 1).

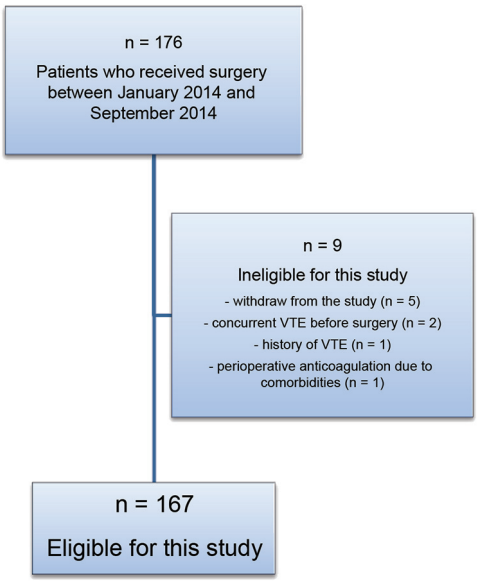

Fig. 1 Flow of patients in the present study.

The study population consisted of 94 (56.3%) men and 73 (43.7%) women aged 58.9±13.6 years (mean ± SD), ranging from 18 to 86 years, as shown in Table 1.

There were five obese patients (BMI: 30 kg/m^2 or more), and 143 (85.6%) normal weight or underweight patients. The most comorbidity of these population was hypertension (29.9%). Thirty-eight (22.7%) patients received preoperative chemotherapy and/or radiotherapy. The most diagnosis and operative procedure were Hepato-Biliary-Pancreatic (HBP) diseases. One hundred five (62.9%) patients had malignant diseases, such as HBP cancer (36 cases), colorectal cancer (35 cases), stomach cancer (17 cases), and other malignant disease (17 cases). Laparoscopic surgery was performed in 4.8%. More than half of the surgeries lasted three hours or more. The duration of immobilization was 3.2±1.9 days, ranging from 0 to 7 days. When using the Caprini risk assessment model, 120 (71.9%) patients had Caprini score >5, which categorized as highest risk for postoperative VTE. The mean of follow-up time was 4.1±2.8 months. Three (1.8%) patients died on same admission of surgery.

Incidence of VTE

DVT was detected in three (1.8%) patients by DUS (Table 2). There was no distal DVT. All of them had clinical symptoms related to DVT. One patient was detected by routine DUS. Three (1.8%) patients were symptomatic PE. They were detected by CT pulmonary angiography. Two patients presented thromboemboli at right segmental branch of pulmonary artery and one patient presented at bilateral segmental branch of pulmonary artery. All of them showed no evidence of DVT. It might be that the small thrombi in the calf veins or the ilio-femoral veins threw emboli to the pulmonary artery before the screening DUS could detect for DVT. As a whole, VTE (DVT and PE) was diagnosed in six (3.6%) out of 167 patients within the next four weeks after surgery. No other VTE case was detected after four weeks until the last follow-up. The further detailed characteristics of VTE events were shown in Table 3.

Risk factors for VTE development

The results of univariate analyses were presented in Table 4. Statistical significance did not exist in the difference between VTE and non-VTE group. When examined by the step backward risk regression model, all of the factors were not found to

Table 1. Background characteristics of the study population (n = 167)

	Number of patients (%)
Age (years), mean ± SD [range]	58.9±13.6 [18-86]
Gender	
Male	94 (56.3)
Female	73 (43.7)
BMI (Kg/m2), mean ± SD	20.9±4.1
<25	143 (85.6)
25-30	19 (11.4)
>30	5 (3.0)
Current smoking	29 (17.4)
Comorbidities	
Hypertension	50 (29.9)
Diabetes mellitus	18 (10.8)
Chronic kidney disease	2 (1.2)
Dyslipidemia	22 (13.2)
Preoperative laboratory, mean ± SD	
Hb (g/dL)	11.7±2.0
Hct (%)	35.9±5.8
INR	1.1±0.2
Total cholesterol (mg/dL)	175.3±71.8
Preoperative medication	
Aspirin	9 (5.4)
Oral contraceptives	3 (1.8)
Steroid	1 (0.6)
Hormonal therapy	1 (0.6)
Leg swelling (during 5-7 days after surgery)	
Unilateral	1 (0.6)
Bilateral	8 (4.8)
Preoperative chemotherapy	23 (13.8)
Preoperative radiotherapy	15 (8.9)
Diagnosis (disease categories)	
Hepato-Biliary-Pancreatic	63 (37.7)
Esophago-gastric	39 (23.4)
Small bowel-appendix	14 (8.4)
Colorectal	42 (25.2)
Others	9 (5.4)
Malignant disease	105 (62.9)
Operative categories	
Hepato-Biliary-Pancreatic	68 (40.7)
Esophago-gastric	25 (14.9)
Small bowel-appendix	25 (14.9)
Colorectal	37 (22.2)
Others	12 (7.2)
Laparoscopic surgery	8 (4.8)
Operative time (hours), mean ± SD	4.0±1.8
≥0.75-3	60 (35.9)
>3-6	85 (50.9)
>6	22 (13.2)
Intraoperative blood transfusion	65 (38.9)
Number of blood (units), mean ± SD	2.9±1.8
Duration of immobilization (days), mean ± SD	3.2±1.9
Caprini score, mean ± SD	5.6±1.9
2 (moderate risk)	9 (5.4)
3-4 (higher risk)	38 (22.8)
>5 (highest risk)	120 (71.9)
Median follow-up time (months)	3.6
Mean follow-up time (months), mean ± SD	4.1±2.8
Death in admission	3 (1.8)

BMI = body mass index; Hb = hemoglobin; Hct = hematocrit; INR = international normalised ratio

Table 2. Incidence of venous thromboembolism (VTE) in the whole study population (n = 167)

	VTE (+)	Incidene (%)	95% CI
DVT	3	1.8	1.65-1.95
Proximal	3	1.8	1.65-1.95
Distal	0	0	
PE	3	1.8	1.65-1.95
Total	6	3.6	3.39-3.81

CI = confident interval; DVT = deep vein thrombosis; PE = pulmonary embolism

be independent risk factors (Table 5). Although there was no statistical significance, the duration of immobilization of more than three days had a trend of developing higher VTE than immobilization of less than three days (RR 4.4; 95% CI, 0.77-24.65; p = 0.096). A BMI greater than 30 kg/m^2 (RR 4.9; 95% CI, 0.50-48.49; p = 0.173) also had a trend of developing VTE.

Discussion

Through a prospective, epidermiological study, it was demonstrated that the incidence of VTE in Thai patients that underwent major abdominal surgery without thromboprophylaxis is considerably much lower (3.6%; 95% CI, 3.39-3.81) than that of Western patients whose incidence was 15 to 30% undergoing general surgery[2]. Postoperative VTE is a general meaning that includes both of asymptomatic VTE and symptomatic VTE. This VTE forms DVT and PE. Furthermore, DVT can be isolated to distal and proximal DVT. After reviewing studies, most paper that report the incidence of VTE comprises of distal or calf DVT, proximal DVT, and symptomatic PE.

Table 3. Characteristics of patients who developed VTE during postoperative periods

Characteristics	Patients					
	1	2	3	4	5	6
Gender/age	Female/60	Male/47	Female/74	Male/73	Female/70	Male/56
BMI	22.8	26.3	24.9	22.5	34.0	23.5
Comorbidities	None	HT	HT, DM	HT, dyslipidemia	HT	None
Malignant	Yes	Yes	No	Yes	Yes	No
Surgery	Transverse colon segmentectomy	Palliative ileosigmiod colostomy	Appendectomy	Extended right hemicolectomy	Explore lap to wedge resection of segment 3th of left lobe liver	Laparoscopic cholecystectomy
Caprini score	5	9	6	8	9	4
Operation time (minutes)	80	185	165	275	140	120
Duration of immobilization (days)	2	7	7	5	4	1
VTE event, Location	Symptomatic DVT, Right popliteal vein to calf vein	Symptomatic DVT, Infrarenal IVC, bilateral CIV, right EIV and CFV	Symotomatic PE, Segmental branch of right PA	Symptomatic DVT, Left FV to left peroneal vein	Symotomatic PE, Bilateral segmental branch of PA	Symptomatic PE, Segmental branch of right PA
Time to VTE events after surgery (days)	16	16	16	7	2	3

HT = hypertension; DM = diabetes mellitus; IVC = inferior vena cava; CIV = common iliac veins; EIV = external iliac vein; CFV = common femoral vein; PA = pulmonary artery; LMWH = low molecular weight heparin

The isolated incidence of DVT (proximal) and PE (symptomatic) in the present study were 1.8% and 1.8%, respectively. This frequency of proximal DVT seemed comparable with that (0-2.9%) in Asian patients undergoing major gastrointestinal or other general surgery[15]. DVT usually starts in the calf veins, from where it may extend to the proximal veins, and subsequently break free to cause PE. Each of these stages of VTE (e.g., distal DVT, proximal DVT, PE) may or may not be associated with symptoms[16]. For distal DVT, in the present study, the distal DVT could not be absolutely found by DUS screening (0%). in Asian studies where DUS screening is applied, it is found that there is 2.1 to 41.7% of distal DVT[5-10]. Furthermore, it is asymptomatic distal DVT that is mostly found. The reason for being unable to detect the distal DVT in the present study is low sensitivity (39.0%) for detecting asymptomatic distal DVT[17] when the DUS is applied to diagnose in this position. Similarly for Symptomatic PE, the frequency of symptomatic PE was comparable with that in the Asian population (0.08-1.8%)[15,18]. In a Japanese study conducted on abdominal surgery patients that consisted of general, gynecologic, and urologic surgery (n = 173), the VTE incidence detected by venography was 24.3%, which was almost comparable to ranges reported in the West[4]. Use of a venography, having a higher sensitivity for VTE detection than DUS, may be one of the reasons for an increased VTE detection as compared to our study. However, DUS is the current standard method for VTE detection as a venography is a cumbersome procedure. To put these risk levels into context, the study populations in the present study were mostly of the high-risk category. One hundred twenty (71.9%) patients who underwent major abdominal and pelvic surgery had Caprini score more than 5. The latest American College of Chest Physicians (ACCP) guidelines attempted to quantify the baseline risks (without any prophylaxis) for each risk group by mathematically adjusting the observed risks of symptomatic VTE reported by Bahl et al[19,20]. Given the Caprini risk categorization described above, the ACCP guidelines would estimate an equivalent Western patient group to have a VTE risk of around 6%. Our findings therefore suggested a lower incidence of VTE in Thai population compared to the Westerners. Moreover, in the present study, the mechanical thromboprophylaxis (graduated compressive stockings or intermittent pneumatic compression) was not included. This is different from Asian studies, which the mechanical thromboprophylaxis is included[4,7-9]. Although there are conflicting results, these mechanical methods might have played an important role in reducing postoperative VTE[21,22].

Table 4. Univariate analyses in the whole study population (n = 167)

Variable	Non-VTE (n = 161)	VTE (+) (n = 6)	RR (95%CI)	*p*-value
Age (years)	58.7±13.7	63.3±10.8	1.03 (0.96-1.09)	0.417
Gender				1.000
Female	70 (56.5%)	3 (50.0%)	1.28 (0.27-6.19)	
Male	91 (43.5%)	3 (50.0%)	Reference	
BMI				0.103
<25	139 (86.3%)	4 (66.7%)	Reference	
25-30	18 (11.2%)	1 (16.7%)	1.88 (0.22-15.97)	
>30	4 (2.5%)	1 (16.7%)	7.15 (0.97-52.92)	
Current smoking	29 (18.0%)	0 (0%)	NA	0.591
Hypertension	46 (28.6%)	4 (66.7%)	4.68 (0.89-24.73)	0.066
Diabetes mellitus	17 (10.6%)	1 (16.7%)	1.66 (0.20-13.39)	0.501
CKD	2 (1.2%)	0 (0%)	NA	1.000
Dyslipidemia	21 (13.0%)	1 (16.7%)	1.32 (0.16-10.76)	0.577
Hb (g/dL)	11.6±2.1	12.3±1.2	1.16 (0.76-1.73)	0.468
Hct	35.9±5.9	37.4±2.9	1.04 (0.91-1.20)	0.555
INR	1.14±0.2	1.1±0.1	1.16 (0.04-37.63)	0.934
Total cholesterol	174.4±72.6	197.7±42.4	1.00 (0.99-1.01)	0.438
Aspirin	8 (5.0%)	1 (16.7%)	3.51 (0.45-26.98)	0.287
Oral contraceptives	3 (1.9%)	0 (0%)	NA	1.000
Steroid	1 (0.62%)	0 (0%)	NA	1.000
Hormonal therapy	1 (0.62%)	0 (0%)	NA	1.000
Preoperative chemotherapy	23 (14.3%)	0 (0%)	NA	1.000
Preoperative radiotherapy	15 (9.3%)	0 (0%)	NA	1.000
Malignant disease	101 (62.7%)	4 (66.7%)	1.18 (0.22-6.26)	1.000
Operative categories				0.554
Hepato-Biliary-Pancreatic	66 (41.0%)	2 (33.3%)	0.727 (0.14-3.86)	
Esophago-gastric	25 (15.5%)	0 (0%)	NA	
Small bowel-appendix	24 (14.9%)	1 (16.7%)	1.13 (0.14-9.32)	
Colorectal	34 (21.1%)	3 (50.0%)	3.51 (0.74-16.69)	
Others	12 (7.5%)	0 (0%)	NA	
Laparoscopic surgery	8 (4.9%)	1 (16.7%)	3.51 (0.46-26.98)	0.287
Operative time (hours)				0.341
≥0.75-3	56 (34.8%)	4 (66.7%)	Reference	
>3-6	83 (51.6%)	2 (33.3%)	0.35 (0.07-1.87)	
>6	22 (13.6%)	0 (0%)	NA	
Intraoperative blood transfusion	63 (39.1%)	2 (33.3%)	0.78 (0.15-4.16)	1.000
Duration of immobilization (days)				0.087
≤3	111 (68.9%)	2 (33.3%)	Reference	
>3	50 (31.1%)	4 (66.7%)	4.19 (0.79-22.15)	
Caprini score				1.000
2 (moderate risk)	9 (5.6%)	0 (0%)	NA	
3-4 (higher risk)	37 (23.0%)	1 (16.7%)	Reference	
>5 (highest risk)	115 (71.4%)	5 (83.3%)	1.58 (0.19-13.14)	

NA = not applicable; RR = risk ratio
Fisher's exact test or Student t-test

The 2012 ACCP guidelines estimate the incidence of symptomatic VTE, in the absence of thromboprophylaxis, at varying risk levels to be as follows: very low risk <0.5%, low risk 1.5%, moderate risk 3%, and high risk 6%[19]. Hence, our estimated symptomatic VTE risk of 4.2% (5/120) in the high-risk

Table 5. Multivariate analysis for all factors whose *p*-value was less than 0.2 from univariate analysis and well-known clinically significant factors such as age, gender, and malignancy

Factors	RR	95% CI	*p*-value
Age	1.0	0.93-1.07	0.936
Female	1.4	0.28-6.86	0.694
Hypertension	3.3	0.54-19.80	0.198
Malignant disease	1.5	0.23-9.24	0.681
BMI			
<25	Reference		
25-30	2.0	0.22-18.49	0.537
>30	4.9	0.50-48.49	0.173
Duration of immobilization >3 days	4.4	0.77-24.65	0.096

patients of the present study placed these patients in the moderate risk group. For this group, the ACCP guidelines suggest pharmacological prophylaxis (grade 2B) or mechanical prophylaxis, preferably with intermittent pneumatic compression (grade 2B). Note that the recommendation for the moderate-risk group is not routine pharmacological prophylaxis but either mechanical or pharmacological prophylaxis depending on bleeding risk[19].

Among baseline risk factors studied, there was no risk factor that was identified as significant by univariate analysis (Table 4). In addition, when evaluated by the multivariate analysis, there was also no risk factor found to be statistically significant (Table 5). In the present study, obese patients underwent surgery with immobilization more than three days were more likely to be susceptible to VTE. In the present study, there was one patient who developed VTE from 24 patients whose BMI was greater than 25 kg/m^2 was 8.3%, and the 50 patients who were immobilized for more than three days, four patients developed VTE, which was 8%. There are number of studies supporting the condition of obesity and postoperative immobilization as independent risk factors for VTE[23-26]. The relationship between gender and the development of VTE is not certain[27,28]. There is a consensus of opinions that age is a risk factor for VTE[23]. In addition, no patients developed VTE in the patients under 40 years, and four VTEs developed among the 86 patients who were more than 60 years old. However, the present study did not show statistically significant differences between the development of VTE and age and gender. Malignancy is generally considered to be a major risk factor for VTE[23,29,30], but it was not identified as a significant risk factor in the present study. This is probably because of the number of patients was one-sided toward the malignant population; thereby, the statistical significance of malignancy might not be precisely evaluated in the present study. In addition to previous studies, there were risk factors affected VTE developing. They were oral contraceptives[23], hormonal therapy[23], chemotherapy[23], hypertension[31], smoking[32], and prolong operative time[4,33,34]. However, there was no statistical difference found in the present study. The reason for this might be the small sample size.

Our study had several limitations. It was conducted at a single institution with a restriction to study only major abdominal surgery, which did not include the patients with vascular surgery, urologic surgery, or gynecological surgery. Those surgeries should be included in future study of major abdominal-pelvic surgery patients in Thai population. Therefore, further studies into these areas are warranted, especially well-designed large studies to develop an accurate risk stratification model specific for the Asian population.

Conclusion

The incidence of VTE in Thai patients undergoing major abdominal surgery is low (3.6%; 95% CI, 3.39-3.81), even in the context of risk factors typically regarded as high risk. Further studies into this area are warranted, especially well-designed large studies to develop an accurate risk stratification model specific for the Asian population.

What is already known on this topic?

Venous thromboembolism has been recognized as a common surgical complication in Western populations. The ninth ACCP Guidelines recommend the routine use of pharmacological prophylaxis for high-risk general surgical patients. One of them has had high-risk major abdominal surgery. However, the necessity of routine pharmacological prophylaxis for high-risk major abdominal surgery in Thai patients has not been determined. The objective of this study was to identify incidence of VTE in the patients following major abdominal surgery in order to gain the information for a comparison between Asian population and Western population. This was a new study in Thailand that has never been done before. However, there are other studies that are similar in other countries in Asia and could be used as references, including to the study of Sakon et al[4] and Kim et al[7].

What this study adds?

Increase the knowledge about the incidence of VTE in the patients who have had major abdominal surgery in Thailand. This frequency of symptomatic VTE seemed comparable with that in Asian patients undergoing major gastrointestinal or other general surgery. The information gained can be applied in further research such as making new risk stratification in the patients with general surgery to consider giving pharmacological or mechanical thromboprophylaxis in Asian population[4,7,19].

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Potential conflicts of interest

None.

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อุบัติการณ์และปัจจัยเสี่ยงต่อการเกิดโรค venous thromboembolism ในผู้ป่วยศัลยกรรมที่ได้รับการผ่าตัดใหญ่ทางช่องท้อง

สิทธิชัย วชิราศรีศิริกุล, กำพล เลาหเพ็ญแสง

วัตถุประสงค์: *Venous thromboembolism (VTE) พบเป็นโรคแทรกซ้อนที่พบได้บ่อยในผู้ป่วยศัลยกรรม ซึ่งพบมากในกลุ่มชนชาติตะวันตกมากกว่ากลุ่มชนชาติเอเชีย มีการแนะนำให้มีการให้ยาป้องกันการเกิดโรค VTE ทุกรายในกลุ่มผู้ป่วยผ่าตัดโรคทางศัลยกรรมทั่วไปที่มีความเสี่ยงสูง อย่างไรก็ตามความจำเป็นในการให้ยาป้องกันในกลุ่มผู้ป่วยผ่าตัดใหญ่ในช่องท้องที่มีความเสี่ยงสูงทุกรายโดยเฉพาะในผู้ป่วยคนไทยยังไม่พบว่ามีการศึกษาเป็นที่ชัดเจน จุดประสงค์ของการศึกษานี้เพื่อหาอุบัติการณ์และปัจจัยเสี่ยงของโรค VTE ในกลุ่มประชากรไทยที่ได้รับการผ่าตัดใหญ่ผ่านทางช่องท้อง*

วัสดุและวิธีการ: *เป็นการศึกษาแบบไปข้างหน้าตั้งแต่ เดือนมกราคม ถึง กันยายน พ.ศ. 2557 ในโรงพยาบาลมหาราชนครเชียงใหม่ มีผู้ป่วย 167 ราย ที่เข้าร่วมการศึกษาและได้รับการผ่าตัดใหญ่ผ่านทางช่องท้อง ผู้ป่วยทุกรายได้รับการตรวจอัลตราซาวด์ที่ขาทั้ง 2 ข้าง ภายหลังการผ่าตัดวันที่ 5 ถึงวันที่ 7 เมื่อค้นหา deep vein thrombosis และในผู้ป่วยที่สงสัยว่าจะเป็นโรค pulmonary embolism ภายหลังการผ่าตัดจะได้รับการตรวจหาโดยเครื่องเอกซเรย์คอมพิวเตอร์อีกด้วย ผู้ป่วยทุกรายจะแบ่งออกเป็น 2 กลุ่ม คือกลุ่มที่เป็นและกลุ่มที่ไม่เป็นโรค VTE ใช้สถิติ Student t-test ในการเปรียบเทียบตัวแปรชนิด continuous variables ระหว่าง 2 กลุ่ม และใช้สถิติ Fisher's exact test สำหรับเปรียบเทียบตัวแปรชนิด categorical variables ค้นหาปัจจัยเสี่ยงของ VTE โดยใช้สถิติ stepwise backward regression analysis และรายงานผลเป็น risk ratio และ 95% CI โดยที่ค่า p-value น้อยว่า 0.05 ถือว่ามีนัยสำคัญทางสถิติ*

ผลการศึกษา: *มีผู้ป่วย 6 ราย ที่ได้รับการวินิจฉัยว่าเป็นโรค VTE คิดเป็นร้อยละ 3.6 ใน 6 ราย มี 3 ราย ที่เป็นโรค deep vein thrombosis และอีก 3 ราย เป็นโรค pulmonary embolism จากการวิเคราะห์หาปัจจัยเสี่ยงไม่พบว่ามีปัจจัยเสี่ยงใดที่มีความสำคัญทางสถิติ อย่างไรก็ตามผู้ป่วยที่ค่า BMI มากกว่า 30 และผู้ป่วยที่นอนอยู่กับเตียงเป็นเวลานานมากกว่า 3 วัน มีแนวโน้มที่จะเป็นปัจจัยเสี่ยงต่อการเกิดโรค VTE*

สรุป: *อุบัติการณ์ของโรค VTE ในผู้ป่วยไทยที่ได้รับการผ่าตัดใหญ่ผ่านทางช่องท้อง พบว่ามีน้อยกว่าเมื่อเทียบกับกลุ่มชนชาติตะวันตก รวมถึงในผู้ป่วยกลุ่มเสี่ยงสูงต่อการเกิดโรค VTE*