International Journal of Medicine and Biomedical Research
Volume 4 Issue 1 January – April 2015
www.ijmbr.com

Original Article Open Access

Venous thromboembolism: awareness and practice of thromboprophylaxis among physicians in a tertiary-care hospital

Ekwere TA[1*], Ino-Ekanem BM[1], Ekanem A[2]

[1]Department of Haematology, University of Uyo Teaching Hospital, Uyo, Akwa-Ibom State, Nigeria.
[2]Department of Community Health, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria.

*Corresponding author: timothyekwere@yahoo.com

Received: 01.12.14; Accepted: 10.03.15; Published: 18.04.15

ABSTRACT

Background: Venous thromboembolism (VTE) is a major public health challenge globally due to its high morbidity and mortality. The condition is often asymptomatic and under diagnosed due to lack of awareness on VTE risk factors and thromboprophylaxis. **Aim:** To determine the level of awareness of VTE risk factors and thromboprophylaxis practices, barriers to thromboprophylaxis and strategies for improving thromboprophylaxis among physicians in University of Uyo Teaching Hospital (UUTH). **Methods:** A cross sectional descriptive study was conducted. Convenient sampling method was used to select participants for the study. There were 85 physicians, 52 from medicine and 33 from surgery department. Data was collected with self administered structured questionnaire and analyzed with SPSS version 11.5. **Result:** The level of awareness of VTE risk factors and thromboprophylaxis practices among physicians was good (95.3% and 83.5% respectively). However, majority (71.8%) did not carry out VTE risk assessment of patients and only a few (18.8%) follow guidelines on VTE prophylaxis. Additional cost, fear of bleeding and lack of knowledge on thromboprophylaxis use (50%, 38.5% and 30.8% respectively) were the major barriers to thromboprophylaxis practice while regular seminars and educational programmes and adoption of locally designed guidelines were the major strategies that could improve thromboprophylaxis practices. **Conclusion:** Awareness of VTE risk factors among physicians in UUTH is good. However, the high level of thromboprophylaxis practice appears doubtful because only a few of these physicians carry out VTE risk assessment for their patients as well as follow clinical guidelines on VTE thromboprophylaxis.

Key words: Venous thromboembolism, deep vein thrombosis, pulmonary embolism, risk factor, risk assessment, thromboprophylaxis

INTRODUCTION

Venous thromboembolism (VTE), which includes deep vein thrombosis (DVT) and pulmonary embolism (PE), is a major public health challenge globally with substantial morbidity and mortality.[1] DVT is a blood clot that forms in major veins of the limbs, pelvis or other large veins in the body. It is often asymptomatic and under diagnosed leading to long term complications particularly PE;[2] hence it is often called a 'silent killer'.

Report from Centre for Disease Control and Prevention (CDC) puts VTE related mortality in

United States (U.S.) to be approximately 60,000–100,000 annually and proximately 5-8% of the U.S population have one of several genetic risk factors for developing DVT.[3] Hospital acquired VTE is a relatively common occurrence and this is known to account for as much as 75% of all VTE related deaths with half the cases occurring soon after hospitalization for surgery or medical illness.[1]

There are certain risk factors that make VTE more likely to occur, these include but not limited to; age greater 40 years, prolonged medical or post-surgical immobility, obesity, malignancy, indwelling intravenous devices, trauma and paresis.[4]

Studies have shown that hospital acquired VTE can be prevented by effective thromboprophylaxis practices.[5] The goal of thromboprophylaxis is to prevent the morbidity and mortality associated with VTE. This involves the use of either pharmacological agents or mechanical devices. The common pharmacological agents include unfractionated heparin, low molecular weight heparin (LMWH) and warfarin, while the mechanical devices include graduated compression stockings (GCS), intermittent pneumatic compression (IPC) and venous foot pump.[6]

However, observations from various studies have shown that the use of VTE prophylaxis is still suboptimal despite the availability of guidelines on appropriate thromboprophylaxis practice. Also where thromboprophylaxis is initiated, the guidelines are not routinely followed.[7,8] In a multicenter study conducted in Canada to determine the proportion of hospitalized acutely ill medical patients that were eligible to receive thromboprophylaxis and the frequency and determinant of appropriateness of its use; the study revealed that most patients hospitalized for medical illness had indications for thromboprophylaxis, but only few, 16% received appropriate prophylaxis.[7]

In Nigeria, like many other countries in Sub-Sahara Africa, there is paucity of information on this subject. However, a post-mortem retrospective study in University College Hospital Ibadan, Nigeria, between 1991 and 1998 reported a VTE prevalence of 2.9%.[9] Thus, this calls for detailed VTE risk assessment and stratification of hospitalized patients.

Therefore, this study aims to determine the level of awareness of VTE risk factors, thromboprophylaxis practices, barriers to VTE prophylaxis as well as strategies for improving thromboprophylaxis practices among physician in University of Uyo Teaching Hospital, a tertiary health facility in South-South, Nigeria. It is our belief that the knowledge generated from this study will help streamline VTE prophylaxis practices among physicians in this centre.

METHODOLOGY

Study site

The study was conducted at the University of Uyo Teaching Hospital, a tertiary referral hospital in Akwa-Ibom State, South-South Nigeria. The hospital provides specialized healthcare services to the indigenes of the oil rich state (of about 4 million people) and neighbouring states.

Study design

A descriptive cross-sectional study design was used to achieve the set objectives.

Study population

The study population were physicians in the Medical and Surgical departments of the hospital. Only those physicians who have worked in these departments for more than 1 year were included in the study. Physicians who worked for less than 1 year in these departments and non-physicians were excluded from the study.

Sample size determination

A pilot study on VTE awareness was conducted among physicians in the hospital who were not part of the study population in this study. A VTE awareness of 95% was obtained. This was used to determine the sample size of the study using the formula for descriptive study

$$n = Z^2 p q / D^2$$

Where n = Desired sample size,
p = prevalence of factor under study (derived from our pilot study as 95%)
q = 1- p => 1 – 0.95 = 0.05;
Z = normal standard deviate usually = 1.96
d = degree of accuracy desired = 0.05
Therefore $n = 1.96^2 \times 0.95 \times 0.05 / 0.05^2 = 72.9 = 73$
The minimum sample size of the study was 73. However the figure was increased to 85, also taking into account a non response rate of 10%.

Sampling method

A total of 85 doctors from the departments of Medicine and Surgery were selected for the study using convenient sampling method.

Data collection

Data was collected using pre-tested, structured and self administered questionnaires. The questionnaires were administered to the

physicians while on the wards or clinics and were retrieved soon after it was completed.

Ethical Consideration
Ethical approval was obtained from the Ethics and Research Committee of the hospital before the commencement of the study. Also, an informed consent was obtained from each respondent before the questionnaire was administered.

Statistical analysis
The data was analyzed using SPSS for Windows Version 17.0. Mean, percentages and standard deviations were calculated for quantitative variables and presented in simple tables. The level of awareness of VTE risk factors and thromboprophylaxis Practices were scored in percentages and graded. A score of 0–33.3% was considered poor; > 33.3% –66.6% was fair and > 66.6% was good.

RESULTS

A total of 85 physicians participated in the study of whom 52 (61.2%) were from medical department while 33 (38.8%) were from surgical department. There were more males respondents than females with a ratio of 2.7: 1 (table1).

Table 1: Socio-demographic characteristics participants

Variables	Frequency (%) n=85
Gender	
Males	62 (72.9)
Females	23 (27.1)
Marital status	
Single	59 (69.4)
Married	26 (30.6)
Department	
Medicine	52 (61.2)
Surgery	33 (38.8)
Mean age of n: 30.7±4.32	

The physicians' level of awareness of VTE risk factors is presented in Table 2. The overall level of awareness of the physicians on VTE risk factors was good (95.3%). Less than 5% had fair awareness level (table 2).

Also, a significant proportion of the physicians (71.8%) do not carry out VTE risk assessment/stratification for hospitalized patients, but most of them (83.5%) initiate thromboprophylaxis for patients with risk VTE factors. However, only very few physicians (18.8%) follow the clinical guidelines on thromboprophylaxis use (table 3).

Additional financial burden or cost to the patient (50%), fear of the patient bleeding (38.5%), and lack of knowledge on how to initiate thromboprophylaxis (30.8%) were the main barriers to the use of thromboprophylaxis by the physicians (table 4).

Furthermore, majority (86.5%) of the physicians believe that regular seminars and educational programmes to increase the level of awareness on VTE prophylaxis for patients at risk as well as formulation of locally developed clinical guidelines for VTE risk assessment/stratification and thromboprophylaxis use (91.5%) are strategies that could help improve their level of thromboprophylaxis practices (table 4).

DISCUSSION

In the absence of clinical guidelines and protocol on VTE risk assessment/stratification and thromboprophylaxis use; identifying hospitalized patients at risk of VTE and who may require VTE prophylaxis could be quite challenging to physicians. The present study assesses the level of awareness of VTE risk factors and thromboprophylaxis practices among physicians in a tertiary hospital in Nigeria.

This study showed that the level of awareness of VTE risk factors among physician in UUTH was good (95.3%). This finding agrees with a similar study among general surgeons where majority (97%) of the respondents were aware and had encountered VTE in the course of their practice while 49% had encountered mortality resulting from PE.[10] Also, in a related study, the authors found that the general level of awareness of VTE risk and thromboprophylaxis among medical staff including doctors at Southampton University Hospital was good.[11] However, this finding contrasts the study by Majluf-Cruz *et al.*[12], in which the authors reported a low level of awareness of VTE risk factors among Mexican internist.

Studies have shown that the practice of thromboprophylaxis in hospitalized patients is suboptimal globally.[7,8] Thromboprophylaxis practice of 83.5% reported in this study seems to contrasts those of other studies.[7, 8] However, a closer observation of the responses of the physicians may very well cast some doubt on this relatively high rate of VTE prophylaxis practices.

Table 2: Physicians' level of awareness on VTE risk factors

Knowledge Questions on VTE	Yes (%)	No (%)
1.VTE is a fatal complication that may occur in hospitalized patients	81 (95.3)	4 (4.7)
2. VTE is a major cause of sudden death in hospitalized patients	77 (90.6)	8(9.4)
3.Surgical in patients are more prone than medical	74 (87.1)	11(12.9)
4. Prolonged hospital stay may increase risk of VTE by 8 fold	76 (89.4)	9 (10.6)
5.Early ambulation of in- patients may prevent VTE development	84 (98.8)	1(1.2)
6. Risk of developing VTE decreases after discharge	54 (63.5)	31(36.5)
7.Deep vein thrombosis can also occur in the upper limbs	64 (75.3)	21 (24.7)
8.VTE may be clinically asymptomatic	76 (89.4)	9 (10.6)
9.VTE clinical features are usually specific	14 (16.5)	71 (83.5)
10. Prolonged immobilization predisposes to VTE in hospitalized patients	85 (100)	0 (0.0%)
11. Cancer predisposes one to VTE	78 (91.8)	7 (8.2)
12. HIV/AIDS may predispose to VTE?	59 69.4)	26 (30.6)
13.Indwelling intravenous devices may predisposes to VTE	81(95.3)	4 (4.7)
14. Pelvic surgery may predisposes to VTE	85 (100.(	0 (0.0)
15. Sepsis may predisposes to VTE	77 (90.6)	8 (9.4)
16. oral contraceptive use may predisposes to VTE	84 (98.8)	1 (1.2)
17. Obesity may predisposes to VTE	84 (98.8)	1 (1.2)
18. Previous DVT history may predisposes to VTE	85 (100.(	0 (0.0)
19. Advancing age > 40yrs may predisposes to VTE	73 (85.9)	12 (14.1)
Overall VTE awareness(%)		
Poor	0 (0.0)	
Fair	4 (4.1)	
Good	81(95.3)	

Table 3: Proportion of physicians who undertake VTE risk assessment, initiate/practice thromboprophylaxis and follow clinical guidelines

Variables	Frequency (%) n=85
VTE Risk Assessment/Stratification	
Yes	24 (28.2)
No	61 (71.8)
Proportion of physician who initia Thromboprophylaxis in VTE risk patients	
Yes	71 (83.5)
No	14 (16.5)
Proportion of physician who follow clinic guidelines on thromboprophylaxis use	
Yes	16 (18.8)
No	69 (81.2)

Table 4: Barriers / strategies to improve thromboprophylaxis practice

Barriers against thromboprophylaxis practice	**Frequency (%)**
Lack of knowledge	28(30.8)
Fear of bleeding	30(38.5)
Lack of clear indications and contra-indications	22(28.2)
Lack of time to consider VTE prophylaxis due to excess work load	21(26.9)
Increase cost on the patient	39(50.0)
Other reasons	2(2.6)
Strategies to improve thromboprophylaxis practice	
Seminars and educational programs to increase awareness on VTE prophylaxis	71 (86.5)
Computerized program for VTE risk assessment & prophylaxis recommendation	36 (43.9)
Formulation of locally developed clinical guidelines for VTE risk assessment/stratification and prophylaxis	75 (91.5%)

To start with, majority of the physicians (71.8%) do not carry out VTE risk assessment/stratification of their patients before admission, also a large proportion (81.2%) do not follow any clinical guidelines on thromboprophylaxis use. This later activities are essential for good thromboprophylaxis practice. Hence, this creates some doubt on the quality or appropriateness of thromboprophylaxis practices by the physicians.

A similar observation was reported in another study in which 66.6% of the respondents (consultant surgeons) initiate thromboprophylaxis but only a few, 21.8% followed the clinical guidelines on thromboprophylaxis use.[13] Gao *et al.*,[11] also reported a low compliance (32%) to the use of clinical guidelines by hospital staff including doctors and this was thought to be responsible for the high level of inappropriate thromboprophylaxis use.

In a multicenter study by involving healthcare providers including physicians, pharmacists and research coordinators in 27 intensive care units in Canada, certain barriers to thromboprophylaxis practices were identified. These include, in order of decreasing frequency; cost of acquiring drugs, fear of patient bleeding, lack of resident education, concern about bio-accumulation in renal failure patients and habit.[14]

These barriers to thromboprophylaxis practice reported in the study above are similar to those identified in this study. 50% of the physicians were of the view that initiating thromboprophylaxis was an additional cost to the patients especially in our environment where the cost of healthcare is completely borne by the patients. A similar proportion (38.5% and 30.8% respectively) believed that the fear of bleeding and lack of knowledge on thromboprophylaxis use were the major barrier their use or practice of thromboprophylaxis. Other studies have identified similar barriers to VTE prophylaxis.[15] This observation shows a huge knowledge gap among different healthcare providers including physicians regarding the already established and documented benefits of VTE prophylaxis.

Among the strategies that may help to improve compliance to thromboprophylaxis practices, majority of the physicians (91.5% and 86.5 respectively) were of the view that formulation of locally developed clinical guidelines for VTE risk assessment/thromboprophylaxis and frequent seminars and educational programme to increase awareness on VTE risk factors is important in achieving this goal. Similar strategies have been reported by other authors.[14, 16]

Zytaruk *et al*.[14] reported pre-printed orders, education, daily reminders during rounds, audit and feedback and endorsement by a local quality improvement committee as the 5 top rated facilitators to thromboprophylaxis use by respondents in their study while Hassan *et al.*[17]

reported a modest improvement in healthcare providers knowledge of thromboprophylaxis guidelines following education via didactic lectures during a VTE awareness day.

A multifaceted approach involving the use of multiple interventions strategies have been suggested to be more effective in improving compliance to thromboprophylaxis practices. Majority of the physicians in our study suggested the use of locally designed clinical guidelines on VTE prophylaxis and frequent seminar/educational programmes to increase awareness on VTE. In a related study, the authors observed that the adoption of multiple interventions including educational presentation, pocket guidelines, implementation of working group to identify barriers to change and introduction of risk reminder cards resulted in an increase as well as appropriate use of VTE prophylaxis among surgical patients from 64% to 97% in an Italian Teaching Hospital.[18] Furthermore, a report from a review study that focused on strategies for improving thromboprophylaxis practice showed that passives dissemination of guidelines was associated with poor compliance to both clinical guidelines and appropriate thromboprophylaxis use.[19] This thus reinforces the need to adopt a multifaceted strategy that may invariably result in an increase as well as appropriate thromboprophylaxis practice.

CONCLUSION

This study has shown that the level of awareness of VTE risk factors among physicians in UUTH is good. However, the high level of thromboprophylaxis practices among the physicians appears doubtful given the fact only a few of these physicians carry out VTE risk assessment/stratification of hospitalized patients as well as comply with the clinical guidelines on thromboprophylaxis use. Additional cost to patients, fear of bleeding and lack of knowledge on thromboprophylaxis were the major barriers to thromboprophylaxis practices while the adoption of locally designed clinical guidelines as well as frequent seminars/educational programmes on VTE thromboprophylaxis were the major strategies that could improve and enhance appropriate thromboprophylaxis practices.

REFERENCES

1. Cohen AT, Agnelli G, Anderson FA, Arcelus JI, Bergqvist D, Brecht JG, Greer IA, Heit JA, Hutchinson JL, Kakkar AK, Mottier D, Oger E, Samama MM, Spannagl M. Venous thromboembolism (VTE) in Europe. The number of VTE events and associated morbidity and mortality. Thromb Haemost 2007; 98: 756-764.
2. Blann AD, Lip GYH. Venous thromboembolism. Br Med J 2006; 332: 215-219
3. Deep venous thrombosis: Data and statistics. Available online: http://www.cde.gov/ncbddd/dvt/data.html. Accessed March 2014.
4. Ekwere TA, Ino-Ekanem MB, Ibanga IA, Akpan IS, Ogunsanya ID, Ekanem EE, Essien EM. Risk factors for deep vein thrombosis among patients in a tertiary hospital, south-south Nigeria. W J Biomed Res 2014;1:10-14.
5. Cohen AT, Davidson BL, Gallas AS, Lassen MR, Prins MH, Tomkowski W, Turpie AG, Egberts JF, Lensing AW. ARTEMIS Investigators. Efficacy and safety of fondaparinux for the prevention of venous thromboembolism in older acute medical patients: randomised placebo controlled trial. BMJ 2006;332:325-329.
6. Cayley jr WE. Preventing deep venous thrombosis in hospital in-patients. BMJ 2007;335:147-151.
7. Kahn SR, Panju A, Greets W, Pineo GF,Desjardins L, Turpie AG, Glezer S, Thabane L, Sebaldt RJ. CURVE study investigators. Multicenter evaluation of the use of venous thromboembolism prophylaxis in acutely ill medical patients in Canada. Thromb Res 2007;119:145-155.
8. Cohen AT, Tapson VF, Bergmann JF, Goldhaber SZ, Kakker AK, Deslandes B, Huang W, Zayaruzny M, EmeryL, Anderson FA Jr. ENDORSE Investigators. Venous thromboembolism, risk and prophylaxis in the acute hospital care setting (ENDORSE study): A multinational cross-sectional study. Lancet 2008;371:387-394.
9. Sotumbi PT, Idowu AT, Akang EE, Aken 'Ova YA. Prevalence of Venous thromboembolism at post mortem in an African population: A cause for concern. Afr J Med Sci 2006;35:345-348.
10. Venkataram A, Santhosh S, Dinakar D, Siddappa S, Babu R, Shivaswamy. Post-operative Venous thromboembolism prophylaxis by general surgeons in a developing country: a survey. Thrombosis, vol. 2013, Article ID 873750, 5 pages, 2013. doi: 10.1155/203/873750.
11. Gao F, Kause J. Thromboprophylaxis awareness among hospital staff. Br J Nurs 2010;19:1175-1178.
12. Majluf- Cruz A, Castro Martinez G, Herrera Cornejo MA,, Liceaga-Cravioto G, Es pinosa LF, Garcia-Chavez J. Awareness regarding venous thromboembolism among internal medicine practitioners in Mexico. A national cross-sectional study. Intern Med J 2012;42:1335-1341.
13. Kahn ZM, Iqbal MJ, Wazir S, Khan M. Awareness and practice of thromboprophylaxis

among surgeons in tertiary care hospital of Khyber Pukhtunkhwa. J Postgrad Med Inst 2012;26:330-335.
14. Cook D, Duffett M, Lauzier F, Ye C, Dodek P, Paunovic B, Fowler R, Kho ME, Foster D, Stelfox T, Sinuff T, Zytaruk N, Clarke F, Wood G, Cox M, Kutsiogiannis J, Jacka M, Roussos M, Kumar H, Guyatt G. CONECCKT-T (Co-operative network of Critical Care Knowledge Translation for Thromboprophylaxis) Investigators; Canadian Critical Care Trial Group. Barriers and facilitators of thromboprophylaxis for medical and surgical Intensive care unit patients: a multicenter survey. J Crit Care 2014;29:471. e1-9. doi: 10.1016/j.jcrc.2014.01.017.
15. Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, Abbound PA, Rubin HR. Why don't physicians follow Clinical practice guidelines? A framework for improvement. JAMA 1999;282:1458-1456.
16. Pai M, Lloyd NS, Cheng J, Thabene L, Spencer FA, Cook DJ, Haynes RB, Schunemann HJ, Douketis JD. Strategies to enhance venous thromboprophylaxis in hospitalized medical patients (SENTRY): a pilot cluster randomized trial. Implementation Science 2013;8:1-8. Doi: 10.1186/1748-5908-8-1.
17. Al-Dorzi HM, Cherfan A, Al-Harbi S, Al-Askar A, Al Hameed F, Al-Moamary M, Abdelaal M, Poff GA, Arabi YM. Knowledge of thromboprophylaxis guidelines pre and post didactic lectures during venous thromboembolism day at a tertary care hospital. Ann Thorac Med 2013;8:165-169.
18. Scaglione L, Piobbici M, Pagano E, Ballini L, Tamponi G, Ciccone G. Implementing guidelines for venous thromboembolism prophylaxis in a large Italian teaching hospital: lights and shadows. Haematologica 2005;90:678-684.
19. Tooher R, Middleton P, Pham C, Fitridge R, Rowe S, Babidge W, Maddern G. systemic review of strategies to improving prophylaxis for venous thromboembolism in hospitals. Ann Surg 2005;241:397-415.

doi: http://dx.doi.org/10.14194/ijmbr.4.1.3
How to cite this article: Ekwere TA, Ino-Ekanem BM, Ekanem A. Venous thromboembolism: awareness and practice of thromboprophylaxis among physicians in a tertiary-care hospital. Int J Med Biomed Res 2015;4(1):14-20

Conflict of Interest: None declared