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RESEARCH ARTICLE

KNOWLEDGE, ATTITUDE AND PRACTICE OF ORTHOPEDIC REGISTRARS TOWARD PROPHYLAXIS OF VENOUS THROMBOEMBOLISM

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ABSTRACT

Background: Deep Venous Thrombosis (DVT) and Pulmonary Embolism (PE) are the most common manifestation of venous thrombosis. It is the third most common cardiovascular diseases and has fatal complications which can be prevented by application of prophylaxis measures according to American college of Chest Physician (ACCP), early detection and adequate treatment. Application of guidelines depends on the knowledge and attitude of practicing providers.
Methods and Results: In this KAP Study we aimed to assess resident's knowledge, attitude and practice toward VTE prophylaxis. Structured questionnaire was used to assess 52 orthopedics registrars. The majority (88.5%) were male. Their age ranged from 23 to 32 year old with the mean 25.5 ± 4.3. 90% was not aware about the prevalence of DVT and 75% underestimated hospital mortality related to VTE. 55.8% didn't appreciate the safety of prescribing LMWH at home, While 65.4% of participants underestimated the importance of mechanical methods. 88.5% practiced VTE prophylaxis however 63% of them did it routinely. Low molecular weight heparin (LMWH) was used frequently by most of them. Although 42.3% were not aware about guidelines of VTE prophylaxis in orthopedic patients, the majority (75%) had accepted attitude level. Only 38.5% of participants were capable of identifying the high-risk patient. LMWH prescribed correctly by 86.5% of participants and the majority (71.2%) had moderate practice toward VTE prophylaxis. In conclusion Knowledge and attitude of orthopedic registrars regarding VTE was suboptimal and an education program should be designed and conducted on regular base to all residents and also for junior residents before starting their training program.

Key words: Venous thromboembolism (VTE), Prophylaxis, Knowledge, Attitude, Practice.

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INTRODUCTION

Deep Venous Thrombosis (DVT) and Pulmonary Embolism (PE) are known as Venous Thromboembolism (VTE) and they are the most common manifestation of venous thrombosis. One third of patients with symptomatic DVT can develop PE (White, 2003). VTE comes in the third place after coronary heart disease and stroke as most common cardiovascular diseases (Goldhaber, 1992). There are more than 900,000 VTE cases occur in USA every year, while in major European countries there are above 750,000 cases every year (Cohen, 2007). Furthermore PE secondary to DVT causes between 25,000 and 32,000 deaths among hospitalized patients in UK annually (Sandler *et al.,* 1989). It is worth noting that treatment of PE reduces mortality significantly from 30% to only 2% (Kamran *et al.,* 1998).

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Many Long term complications can occurs secondary to venous thrombosis, about 25% of patients can experience recurrence of thrombosis within 5 years (Prandoni *et al.,* 2007), while Pulmonary hypertension occur in about 4 % of patients with venous thrombosis in first 2 years (Pengo *et al.,* 2004). VTE is preventable disease and according to American college of Chest Physician (ACCP)guidelines, patients undergoing orthopedic surgeries, non-orthopedic surgeries [GIT, vascular, urological, etc.] and non-surgical patients with high risk to develop DVT [cancer patients, immobilized patients, long distance travel, etc.] should undergo extensive primary prevention against VTE, which include the use of low molecular weight heparin(LMWH), low dose unfractionated heparin (LDUH), oral anti-coagulant (Dabigatran, Apixaban or Rivaroxban), Fondaparinux, adjusted dose vitamin K antagonist , Aspirin or intermitted pneumatic compression devices (Falck-Ytter *et al.,* 2014). The use of low molecular weight heparin preoperatively lead to reduction of fatal PE from 8 to 1 per 1000 patients operated (Sandler *et al.,* 1989).

Application of guidelines depends on the knowledge and attitude of practicing providers. *Vardi et al* surveyed physicians from 30 countries of European federation of internal medicine (EFIM); he found that 40.1% of them underestimated the magnitude of clinical problem, in addition, 64% worked without formal VTE prophylaxis program. The risk of bleeding, lack of awareness and lack of decision support system represented the most common reasons for delay of treatment (Vardi *et al.,* 2012). Another cross-sectional study in Pakistan among health care provider in five teaching hospitals showed that although 98.8% agreed that DVT prophylaxis is clinically important, only 39.4% actually prescribed prophylaxis and only 10.3% of them did this routinely. Knowledge and practice were found to be less than the ideal (Bhatti *et al.,* 2012). In 2012 another KAP study among interns in university of Santo Tomas hospital found that there was tendency to underestimate VTE risk among patients, and substandard awareness (72%). However, 83% reported that the institution has no formal VTE prophylaxis protocol (Mendoza and Visperas). *Venkataram et al* reported that, in India, 97% of general surgeons had encountered VTE in their clinical practice, with 38% faced it in 1%-5% of their patients. He also reported that 64% of the surgeons do not routinely score patients preoperatively for their VTE risk (Venkataram *et al.,* 2013). In Sudan we do not have published local guidelines regarding DVT prophylaxis. VTE is a disease with devastating and fatal complication; it is also an easily preventable disease. This study was conducted to assess resident's knowledge, attitude and practice.

METHODS

This across-sectional KAP study conducted in Khartoum from March to September 2015. Study population was orthopedic surgery registrars (resident) from Sudan Medical Specialization Board (SMSB). Structured questionnaire was used. A pilot study was done using random samples from rotating orthopedic registrar to confirm its validity and feasibility. Residents were selected randomly by selecting odd number from the registrars list in the SMSB record, and they represent different orthopedic training centers. Out of 62 distributed questionnaires, respondents were 52.

Data was analyzed using the statistical package for social science (SPSS-21) software and Microsoft Excel (2013). The study was approved by SMSB ethical committee.

RESULTS

A total of 52 orthopedics registrars returned the questionnaire. There were Six females (11.5%) and 46 male (88.5%). They were at different training levels with 11, 19, 13 and 9 from the first, second, third and fourth year of training respectively. Their age ranged from 23 to 32 year old with the mean 25.5 ± 4.3. The majorities (59.6%) were between 25 and 30 years. Participants' responses are shown in (Table1). Almost more than one third (36.5%) of the residents reported that DVT is mostly symptomatic. The majority (90%) was not aware about the prevalence of DVT and 75% underestimated hospital mortality related to VTE. The possibility of developing DVT after discharge was not recognized by 38.5%. The majority (96.2%) of participants knew the suitable time for stopping treatment before surgery. Tow third (65.4%) didn't appreciate the importance of mechanical methods as prophylaxis. Regarding prescribing LMWH at home after discharge, more than half (55.8%) didn't appreciate its safety. Only 19 (36.5%) of registrars received continuous professional development education regarding VTE. Generally, the level of knowledge is ranging from good in less than 2%, moderate (34.6%) while the majority had poor (63.5%) knowledge, as shown in (table 2). Assessment of registrar attitude toward VTE prophylaxis showed that Most of the respondents agreed that DVT prophylaxis is clinically important. The practice revealed that 29 (63%) of the participants prescribed the prophylaxis routinely and on regular bases and 17 (37%) occasionally. Low molecular weight heparin (LMWH) had been used by 84.6% of registrars, followed by combination of methods (11.5%), and un-fractionated heparin (UFH) (1.9%). When LMWH is not accessible or available 50% of the registrars prescribed UFH and 7.7% utilized stocking. Overall only 57.7% of them use mechanical method as prophylaxis. In term of knowledge about formal guideline, a considerable proportion of 42.3% were not aware about guidelines of VTE prophylaxis in orthopedic patients. Generally, 39 (75%) had accepted attitude while 13 (25%) had unaccepted attitudes toward the VTE prophylaxes in orthopedics patients as illustrated in (Table 2).

Table1. Knowledge about VTE and prophylaxis among orthopedic residents (total 52)

Knowledge	Frequency		
DVT clinical presentation	Mostly symptomatic 19(36.5%)	Mostly A symptomatic 33 (63.5%)	-
Frequency of Hospital death due to PE	Correct estimation 7 (13.5%)	Underestimation 38 (75%)	Overestimation 6(11.5%)
Prevalence of VTE in hospitalized patients	Aware 5 (9.6%)	Not aware 47 (90.4%)	-
Prevalence of VTE after hospital discharge	Aware 32 (61.5%)	Not aware 20 (38.5%)	-
Pharmacological drugs for prophylaxis	Adequate 18 (34.6%)	Inadequate 34 (65.4%)	-
Significance of mechanical methods	Aware 18 (34.6%)	Not aware 34 (65.4%)	-
Time to stop Prophylaxis prior to surgery	Aware 50 (96.2%)	Unaware 2(3.8%)	-

Table 2. Overall grading of knowledge, attitude and practice about VTE prophylaxis

VTE prophylaxis	Level	Frequency	Percentage
Knowledge*[1]	Good	1	1.9%
	Moderate	18	34.6%
	Poor	33	63.5%
Attitude*[2]	Accepted	39	75%
	Unaccepted	13	25%
Practice*[3]	Good	8	15.4%
	Adequate	37	71.2%
	Inadequate	7	13.5%

*1 Good for score 7 and above out of 10, Moderate for score 5 & 6 out of 10, Poor knowledge for 4 & below out of 10.
*2 Accepted attitude score 5 and above out of 10, Unaccepted attitude for score 4 and below out of 10.
*3 Good practice score above 6 out of the 10, adequate practice score 4 to 6 out of 10, inadequate practice score less than 4 out of the 10.

We noticed that the practice of VTE prophylaxes in hospitals varies with the majority (61.5%) of registrars working in hospitals that have prophylaxis policy. However, only few registrars (13.5%) were compliant with the hospital policy. We also found that (38.5%) of participants were capable of identifying the high-risk patient according to the American Academy of Orthopedic surgeon (AAOS) and American chest society guideline. LMWH and UFH were prescribed correctly by 86.5%and 48.1% of participants respectively. Adjustment of the dose for patients with renal failure was implemented correctly by 53.8% the duration of prophylaxis was continued for 3-4 post-operative days, 2 weeks and up to 5 weeks by 44.2%, 44 % and 5.8% respectively. In general, the majority (71.2%) had moderate practice while only 8 (15.4%) doctors had good practice and 7 (13.5%) had inadequate poor practice toward VTE prophylaxis as demonstrated in (Table2).

DISCUSSION

VTE is an important cause of hospital deaths and morbidity; it can be easily prevented by simple measures. Guidelines for thrombo-prophylaxis are available for many years but the compliance remains unsatisfactory throughout the world. This is attributed to many reasons such as the use of wrong type of prophylaxis or the use for inadequate time or failure to use prophylaxis at all (Yu *et al.,* 2007). It is noteworthy that 36.5% of our participants were unaware about indications of VTE prophylaxis in hospitalized orthopedic patients. There was alarming underestimation (75%) of the attributed mortality and prevalence of VTE. This is comparable to what was reported by *Makusidi et* al in Nigeria, as he reported that medical doctors' knowledge about prevalence of VTE was low (Makusidi *et al.,* 2014). Tow third of the participants claimed that their unit or the hospital had policy regarding DVT prophylaxis. Interestingly, their responses reflected unsatisfactory awareness or non-compliance with guidelines. It has been suggested in a recent study that adopting common hospital wide guidelines improves DVT prophylaxis prescription rate (Mirza *et al.,* 2005). This call for intervention at the individual and system based levels. The system based intervention can be adoption with local customization of guidelines and dissemination through well-structured orientation. Continuous monitoring might be needed for sustainability. The use of more than one strategy is more effective than single one, thus the use of various methods of reminding physician to frequently assess patients for VTE risk using electronic or paper based system in addition to the use of audits in order to insure positive deployment of these interventions is more likely to give the desired outcome and improve the practice (Tooher *et al.,* 2005; Lau and Haut, 2014). Use of alerts such as computerized reminders or stickers on patients charts lead to significant increase in number of patients who received prophylaxis, while the use of combined education and alerts system associated with largest effect (Kahn *et al.,* 2010). Presumed increased risk for excessive bleeding, was elicited as a major barrier for starting VTE prophylaxis. The same concern was reported by *Rodgers et al*, as he described that the fear of both exsanguination as well as post-operative hematoma that can lead to wound infection and breakdown were the major barrier (Rodgers *et al.,* 1994). This needs to be balanced against the risk of VTE and its complications. Another study in North China revealed that 60.1% of the staff in surgical ICUs worried about risk of hemorrhage (Tang *et al.,* 2015). This reflects that instructional and learning methods have to emphasize these aspects. Starting drugs for prophylaxis should be considered after taking into account both the benefits and the side effects, thus all patients should be assessed for risk of VTE and the risk of bleeding, but generally the clinical benefits of reducing PE outbalance the risk of bleeding (Qaseem *et al.,* 2011). Mechanical prophylaxis such as IPC or GCS are recommended to be used alone in hospitalized patients when they have active bleeding or high risk of bleeding, furthermore when this risk reduce, it should be substituted by pharmacologic prophylaxis (Falck-Ytter *et al.,* 2012). LMWHs appear to be the preferred form of pharmacological prophylaxis amongst Sudanese surgeons, this is the same as in British and New Zealand surgeons (Rodgers *et al.,* 1994). Because these drugs exhibit more consistent and predictable pharmacology, the problems of repeated laboratory estimations and multiple administrations of the drug are reduced, however, it is important to realize that the multitude of available LMWHs on the market today have drug specific properties, based on their molecular weights. They are therefore not interchangeable (Planés *et al.,* 1999). Aspirin was the least commonly used pharmacological agent by our respondents. With its low cost, aspirin may be considered a reasonable alternative thrombo-prophylaxis after surgery (Anderson *et al.,* 2013). Most studies on VTE prophylaxis focus on total knee and hip arthroplasties, and fracture neck of femur. Little information is available with regard to VTE prophylaxis in spine, pelvis, tumors, and trauma surgery. The majority of surgeons in this study employ prophylaxis preoperatively and extend its use until the patient is ambulatory. The trend towards early mobilization and physiotherapy after surgery might explain why mechanical prophylaxis is not more frequently used in combination with pharmacological agents. Several studies have illustrated the importance of 'prolonging' prophylaxis since VTE may occur several months after discharge (Dahl, 1998).

Conclusion

Knowledge and attitude of orthopedic registrars regarding VTE is substandard. Implementation of VTE prophylaxis protocol by hospitals might not be enough to bridge the gap. An education program about VTE prophylaxis should be designed and conducted on regular base to all residents and also for junior residents before starting their training program.

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