Available online at **www.ijmrhs.com**

ISSN No: 2319-5886

International Journal of Medical Research & Health Sciences, 2019, 8(7): 15-21

Pregnant and the Postpartum Women's Knowledge and Awareness of Venous Thromboembolism

Razan Ahmed*, Lama Alfehaid and Hind Almodaimegh

College of Pharmacy, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

**Corresponding e-mail: razan-ahmed7x1@hotmail.com*

ABSTRACT

Background: *The incidence of Venous thromboembolism (VTE) in pregnant women is 4-5 times higher than that in non-pregnant women, and the risk is increased postpartum. There are limited studies that assess the awareness of VTE among at-risk pregnant and postpartum women.* ***Methods:*** *A quantitative cross-sectional study including a validated survey was administered to pregnant women in the outpatient clinic and those hospitalized for labor at King Abdulaziz Medical City (KAMC) in Riyadh, Saudi Arabia.* ***Results:*** *Out of 340 participants, 57% correctly described the cause of deep vein thrombosis (DVT). Only 26.8% and 13.8% reported awareness of DVT and Pulmonary embolism (PE) respectively. About 32% of the participants who had previous knowledge about DVT, knew that swelling of the leg is one of its major symptoms, and only 25% recognized the shortness of breath as a major symptom of PE. Long periods of inactivity or undergoing surgery were correctly identified as key risk factors for developing a blood clot by only 20%, and 14.4% of the participants respectively, while 7.5% were aware that pregnancy or postpartum are risk factors for VTE. Though most participants (99.7%) agreed that blood clots can cause death, 90.3% believed that blood clots cannot be prevented. The educational level has a significant effect on participants' awareness of DVT.* ***Conclusion:*** *This study demonstrates knowledge deficit and lack of awareness of VTE among pregnant and postpartum patients. More effort must be provided to increase the awareness of VTE risk to ensure safe and high-quality patient care.*

Keywords: Pregnant women, Venous thromboembolism, Deep venous thrombosis, Pulmonary embolism

INTRODUCTION

Venous thromboembolism (VTE) is one of the acute conditions that lead to mortality and morbidity [1]. VTE is a process of formulating clots in the vein, which usually occurs in the lower extremities. There are two types of VTE which are Deep vein thrombosis (DVT) and Pulmonary embolism (PE). DVT is the formulation of clots in the deep veins. DVT can lead to PE when clots in leg move to the blood vessel of the lungs and block it. One of the risk factors that develop VTE in pregnancy. The event of VTE in pregnant women is 4-5 times higher than in non-pregnant women [2-8]. There are some studies that has shown factors that lead to VTE at antepartum such as multiple delivery [9], varicose vein, Inflammatory bowel disease (IBD), urinary tract infection, diabetic mellitus [10], chronic hospitalization, Body mass index (BMI) equal or more than 30 kg/m^2, age equal or more than 35 years [11]. The VTE increases more in postpartum than antepartum, especially in first 6-weeks and it can persist for 12-weeks with low risk compared to first weeks [12]. Abortion is the most common factor that leads to VTE in postpartum. Other factors that participate in VTE are varicose veins, IBD, cardiac disease, Body mass index (BMI) equal to or more than 30 kg, preterm delivery, and cesarean section [10]. The pathophysiology of VTE in antepartum and postpartum are related to Virchow's triad which are hemodynamic changes, hypercoagulability, and endothelial damage. Hemodynamic changes include stasis of lower extremities in pregnant women. Stasis is related to two factors: first, the compression of the gravid uterus to inferior vena cava and iliac vein [13]. Second, the change in the capacity of the vein during pregnancy, along with hypercoagulability, as the coagulation cascade factors, will increase and protein C will decrease [2]. A study has shown high resisting to protein C activation is related to VTE [14]. Injury of uteroplacental endothelial, because of delivery it is also associated with higher VTE events in the immediate postpartum period [9]. The prevalence of risk getting VTE in antepartum and postpartum in the Arabian Gulf is noticeable because of the high prevalence of pregnant women who have at least one risk factors. Obesity takes the highest percentage

67%. Other common risk factors are repeated birth takes (33%), recurrent abortion (9.1%), varicose veins (6.9%), thrombophilia (2.6%), immobilization (2.0%), sickle cell disease (2.8%) and previous VTE (1.6%) [15]. A study shows that awareness of VTE globally is poorly weak. This includes awareness of the major risk factors such as hospitalization, surgery, pregnancy, and cancer [16]. There are limited studies that assess awareness of VTE among at-risk pregnant and postpartum women.

MATERIALS AND METHODS

Study Design

This was a cross-sectional study including a questionnaire administered to who was admitted to King Abdulaziz Medical City (KAMC) during February 2017-July 2017, pregnant and postpartum women patients who were following up at/or have admitted to King Abdulaziz Medical City (KAMC) for giving birth, the sample size was calculated based on average daily census of pregnant patients who follow at OB/GYN KAMC plus the number of labor per month (2910), by using online sample size calculator [Raosoft®, Inc], at 5% margin of accepted error, and 95% confidence interval, the representative sample size of the total population is 340. Participants were selected by convenience sampling from pregnant women who were giving birth or following up at KAMC and met the inclusion criteria which are age more than 18 years and being conscious especially after surgery. Patients aged less than 18 years old pregnant women, critically ill, cognitively impaired, or healthcare professionals were excluded. The investigator was asking the patient permission before giving the survey with a description of the study and its objectives. Patients who agree to participate handled the questionnaire and were asked to complete. The investigator was waiting to receive the completed questionnaire, and provide any clarification if have been asked by the participants.

Survey Instrument

A previously validated questionnaire that met the study objectives has been used [16]. The questionnaire has been translated into Arabic and validated in a pilot study including 10 content expert Arabic speakers to confirm readability and completeness. The questionnaire consists of 19 close-ended questions intended to discern:

- Demographic information including age, the level of education, number of pregnancies/abortions and the reason for the hospital visit
- Past VTE medical history or family history of VTE and or whether she is receiving thromboprophylaxis
- Subjects' knowledge about DVT and PE including their underlying cause, risk factors, symptoms of DVT and PE
- Source of VTE information if they have any

The questionnaires were collected and safely stored at the PI office. Data is saved into an appropriately designed Excel spreadsheet.

Statistical Analysis

Descriptive statistics including the number and percentage of respondents by demographic characteristics, education level, current pregnancy, frequency of pregnancies/abortions, personal and family history of DVT and PE was obtained. Percent awareness of correct and incorrect signs and symptoms of DVT and PE were calculated. Awareness of VTE risk factors and preventive measures were also computed. Awareness of DVT and PE were compared by a number of characteristics including the level of education, current pregnancy, frequent of pregnancies/abortions, personal and family history of VTE using the Chi-square test. Statistical significance was considered at $p<0.05$. All statistical analyses were performed using SPSS version 21.0 (Release 21.0.0.0, IBM, USA).

RESULTS

Total of 340 participants completed the survey. About 46% were aged 26-33 years old, 48.7% completed university education. Half of the participants were pregnant 49.6% and half were hospitalized for labor 50.4%. Total 57% of the participants have 1-3 pregnancies, and most of them (90%) have no history of abortions. About 27% were currently receiving thromboprophylaxis (Table 1).

Table 1 Demographics (n=340)

Variables	Frequency	Percentage (%)
Age (Years)		
18-25	63	18.5%
26-33	156	45.9%
33-40	113	33.2%
41-48	8	2.4%
Education Level		
Illiterate	12	3.5%
Less than high school	60	17.6%
High school completed	90	26.4%
University completed	166	48.7%
Postgraduate education	13	3.8%
Pregnancy		
Yes	171	50.1%
No	170	49.9%
Frequent of Pregnancies		
0	4	1.2%
1-3	194	56.9%
4-7	130	38.1%
>8	12	3.5%
Frequent of Abortions		
0	308	90.9%
1-2	1	0.3%
3-4	22	6.5%
>5	8	2.4%
Reason for your Hospital Visit		
Following up at Obstetrics and Gynecology Clinic	168	49.6%
Labor	171	50.4%
History of Venous Thromboembolism		
Yes	14	4.1%
No	321	94.7%
Family history of Venous Thromboembolism		
Yes	40	11.8%
No	292	86.1%
Current Thromboprophylaxis		
Yes	91	26.9%
No	243	71.9%

Total 57.9% described the underlying cause of a deep vein thrombosis correctly. Only 26.8% and 13.4% reported knowledge of DVT and PE, respectively. About 32% of the participants who had previous knowledge about DVT, knew that swelling of the leg is one of its major symptoms, and only 25% recognized the shortness of breath from those who had previous knowledge about PE as one of the major symptoms. Almost 43% of participants were aware of one of the correct preventive measures (Table 2).

Table 2 Awareness of VTE

Variables	Frequency	Percent (%)
Phrases best describe the underlying cause of a deep vein thrombosis		
A blood clot in a vein	197	57.9%
Lack of oxygen in a vein	34	10.0%
A tumor in a vein	13	3.8%
None of the above	9	2.6%
Not sure	87	25.6%
Do you know what a blood clot in your leg		

Yes	91	26.8%
No	249	73.2%
Symptoms of DVT		
*Swelling of your leg	79	32.2%
Itching of your leg	6	2.4%
Pain or tenderness in *your leg	61	24.9%
Noticeable changes in the skin color of *your leg	50	20.4%
The leg feels warm to *the touch	32	13.1%
Leg paralysis	17	6.9%
Do you know what blood in your lung		
Yes	45	13.4%
No	292	86.6%
Symptoms of PE		
*Shortness of breath	35	25.2%
Slow, shallow breathing	12	8.6%
Chest pain (may be worse with a deep *breath)	27	19.4%
Rapid heart rate	25	18.0%
Lightheadedness or *passing out	14	10.1%

Figure 1 illustrates the percentage of participants who were aware of VTE risk factors. Not moving for long periods of time or undergoing surgery were correctly identified as major risk factors for developing a blood clot by only 20%, 14.4% of the participants respectively. Incorrect risk factors such as high blood cholesterol have been identified to be a VTE risk factor by 59% of participants.

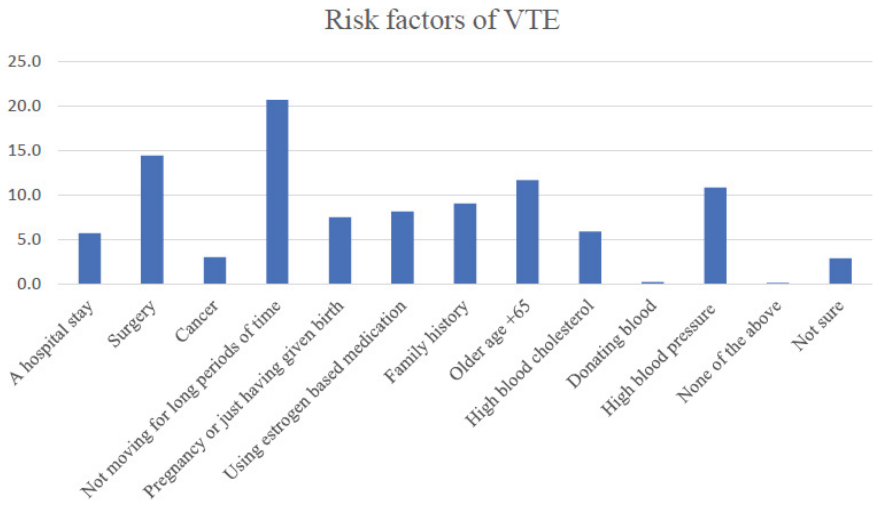

Figure 1 Awareness of VTE risk factors

Most participants (99.7%) agreed that blood clots can cause death. However, 90.3% believed that blood clots cannot be prevented. Moreover, 74% agree that people under 40 years of age do not have to worry about blood clots, and 94% were not aware of the possibility of a blood clot in the leg traveling to the lungs if it is left untreated. When participants were asked about the source of their information and how they learned about VTE, 34% received their information from their family and friends, and only 18% received their information from a physician (Table 3).

Table 3 Respondents' attitude towards blood clotting

Variables	Frequency	Percent (%)
People under 40 years old do not have to worry about blood clots		
Agree	253	74.4%

Disagree	87	25.6%
Most blood clots cannot be prevented		
Agree	307	90.3%
Disagree	33	9.7%
It is not likely that a blood clot in the leg left untreated can travel to your lungs		
Agree	321	94.4%
Disagree	19	5.6%
Having a blood clot is not considered a medical emergency		
Agree	156	46.0%
Disagree	183	54.0%
Blood clots can cause death		
Agree	335	99.1%
Disagree	3	0.9%

Level of education, personal and family history of VTE has a significant effect on participants' awareness of DVT. In addition, currently, pregnant women, those who had a personal history of VTE or have been following up at obstetrics and gynaecology clinic were more aware of PE (Table 4).

Table 4 Number and percentage of respondents reporting awareness of DVT by respondents' characteristics

Respondents' Characteristics	Number Aware	p-value
Current Pregnancy		
Yes	43	0.29
No	48	
Frequency of Pregnancy		
3 or below	57	0.24
4 or more	33	
Level of Education		
High school or below	34	0.026
University completed or postgraduate	57	
History of Abortion		
Yes	8	0.94
No	81	
History of Venous Thromboembolism		
Yes	12	0.00
No	77	
Family history of Venous Thromboembolism		
Yes	20	0.01
No	69	
Reason for your hospital visit		
Following up at Obstetrics and Gynecology Clinic	42	0.58
Labor	47	
Current thromboprophylaxis		
Yes	28	0.28
No	62	

DISCUSSION

The results are consistent with previous studies. It shows that finding of VTE's awareness is considered to be globally not limited to a specific nation or specific of a health condition such as cancer patient [16,17]. The awareness of VTE among postpartum and pregnant women based on results show very poor outcomes. The participants who define the cause of VTE correctly were 57.9%. Even though more than half they define it right, only 26.8% identify the signs and symptoms for DVT and 13.4% for PE, which indicate that the question can be answered with common sense because even in the awareness study about VTE among hospitalized patients, the participants define the cause of VTE (47.1%) correctly, with lack of knowledge in the signs and symptoms of DVT (31%) and PE (14.9%) [18]. It is essential that pregnant women to be aware of the DVT sign and symptoms because it is difficult to differentiate it

from a varicose vein as both have similar symptoms e.g. changing skin color, pain in or swelling of the leg. However, both conditions' management is totally different. Thus, the health provider should notify the differences to the patient because pregnancy associated with viscose's vein is 82% [19]. This will lead to a delay in the management of DVT if the patient does not realize the difference. A study of awareness of VTE in pregnant women, who had traveling experience, shows that a quarter of patients are not aware that VTE is a risk for them. Comparing to another group who did not experience traveling was less than half aware of the risk; this study shows that pregnant woman, in general, had deficient knowledge of VTE risks [20]. Similarly, our results indicate that patients were poorly aware that they are at risk of VTE, only 7% identify that they are at a risk in postpartum which has been proved to have a higher risk of thrombotic events in the first 6-week, and during pregnancy [12]. Thus, using hormonal estrogen such as contraceptive in this period will add on the risk because it increases VTE risk 2-folded compared to placebo [21]. Unfortunately, only 8.2% were aware of the fact that hormonal therapy causes VTE. About 10.8% answered that hypertension cause VTE which is incorrect, which may demonstrate the confusion of the public between venous and arterial thrombosis risk factors [22]. They also underestimated other moderate to high-risk factors by 3% and 14.4% respectively for VTE such as cancer and surgery. This misperception leads to not worry about developing VTE in young age as it is demonstrated in our study by 74.4%.

Not moving for a long period of time have been identified as a risk factor by only 20% compared to another study of awareness of VTE among hospitalized patients where 76% of participants were aware [18]. Thus, emphasize the lack of awareness in this population. Furthermore, less than half of the patients identify the correct prevention way for VTE.

The study result arises an important point; about 90% of patients underestimate the causal effect of DVT that can travel to lung and progress to PE. Proven that only 13% answer that they know what PE is. Moreover, less than half of patients (46%) prefer that they would seek emergency in this case, which delays essential management of DVT, and may further progress to PE.

Limitations

The survey was close-ended questions, so may inflate the result because may have permit respondents to guess rather than answer us their knowledge, particularly in response to questions where more than one answer was allowed. However, it could overcome by other questions that demonstrate the disease clearly such as symptoms questions of VTE and the risk factors. This will ensure the solid knowledge that they have. Also, the investigator was interviewing the participants with the open-ended question.

CONCLUSION

This study raises the importance of educating pregnant women and postpartum about VTE due to their poor awareness. It is clearly demonstrating by percentage in most of the section questions e.g. signs and symptoms, the risk factors, and the prevention. Thus, encourages the health provider to aware the pregnant women and postpartum about the sign and symptoms of VTE. This will help to seek emergency compared to the varicose vein. Also, it is advisable for a voluntary lifestyle for pregnant women and postpartum women.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

[1] Wendelboe, A. M., et al. "ISTH Steering Committee for World Thrombosis Day. Global public awareness of venous thromboembolism." *Journal of Thrombosis and Haemostasis,* Vol. 13, 2015, pp. 1365-71.

[2] Marik, Paul E., and Lauren A. Plante. "Venous thromboembolic disease and pregnancy." *New England Journal of Medicine,* Vol. 359, No. 19, 2008, pp. 2025-33.

[3] Greer, Ian A. "Thrombosis in pregnancy: maternal and fetal issues." *The Lancet,* Vol. 353, No. 9160, 1999, pp. 1258-65.

[4] NIH Consensus Development. Prevention of venous thrombosis and pulmonary embolism. *The Journal of the American Medical Association*, Vol. 256, No. 6, 1986, p. 744.

[5] Kujovich, Jody L. "Hormones, and pregnancy: thromboembolic risks for women." *British Journal of Hematology,* Vol. 126, No. 4, 2004, pp. 443-54.

[6] Heit, John A., et al. "Trends in the incidence of venous thromboembolism during pregnancy or postpartum: a 30-year population-based study." *Annals of Internal Medicine,* Vol. 143, No. 10, 2005, pp. 697-706.

[7] Morris, J. M., C. S. Algert, and C. L. Roberts. "Incidence and risk factors for pulmonary embolism in the postpartum period." *Journal of Thrombosis and Haemostasis,* Vol. 8, No. 5, 2010, pp. 998-1003.

[8] James, Andra H., et al. "Venous thromboembolism during pregnancy and the postpartum period: incidence, risk factors, and mortality." *American Journal of Obstetrics and Gynecology,* Vol. 194, No. 5, 2006, pp. 1311-15.

[9] Simpson, E. L., et al. "Venous thromboembolism in pregnancy and the puerperium: Incidence and additional risk factors from a London perinatal database." *BJOG: An International Journal of Obstetrics and Gynecology,* Vol. 108, No. 1, 2001, pp. 56-60.

[10] Sultan, Alyshah Abdul, et al. "Risk factors for first venous thromboembolism around pregnancy: a population-based cohort study from the United Kingdom." *Blood,* Vol. 121, No. 19, 2013, pp. 3953-61.

[11] Sultan, Alyshah Abdul, et al. "Risk of first venous thromboembolism in pregnant women in hospital: population based cohort study from England." *BMJ,* Vol. 347, 2013.

[12] Kamel, Hooman, et al. "Risk of a thrombotic event after the 6-week postpartum period." *New England Journal of Medicine,* Vol. 370, No. 14, 2014, pp. 1307-15.

[13] Goodrich, Samuel M., and J. Edwin Wood. "Peripheral venous distensibility and velocity of venous blood flow during pregnancy or during oral contraceptive therapy." *American Journal of Obstetrics and Gynecology,* Vol. 90, No. 6, 1964, pp. 740-44.

[14] Bergrem, Astrid, et al. "Resistance to activated protein C is a risk factor for pregnancy-related venous thrombosis in the absence of the F5 rs6025 (factor V Leiden) polymorphism." *British Journal of Hematology,* Vol. 154, No. 2, 2011, pp. 241-47.

[15] Alsayegh, Faisal, et al. "Venous thromboembolism risk and adequacy of prophylaxis in high-risk pregnancy in the Arabian Gulf." *Current Vascular Pharmacology,* Vol. 14, No. 4, 2016, pp. 368-73.

[16] Wendelboe, Aaron M., et al. "Global public awareness of venous thromboembolism." *Journal of Thrombosis and Hemostasis,* Vol. 13, No. 8, 2015, pp. 1365-71.

[17] Sousou, Tarek, and Alok A. Khorana. "Cancer patients and awareness of venous thromboembolism." *Cancer Investigation,* Vol. 28, No. 1, 2010, pp. 44-45.

[18] Almodaimegh, Hind, et al. "Awareness of venous thromboembolism and thromboprophylaxis among hospitalized patients: a cross-sectional study." *Thrombosis Journal,* Vol. 15, No. 1, 2017, p. 19.

[19] Ismail, Lars, et al. "A systematic review and meta-analysis of the risk for development of varicose veins in women with a history of pregnancy." *Journal of Vascular Surgery: Venous and Lymphatic Disorders,* Vol. 4, No. 4, 2016, pp. 518-24.

[20] Kingman, Charlotte E., and Demetries L. Economides. "Travel in pregnancy: pregnant women's experiences and knowledge of health issues." *Journal of Travel Medicine,* Vol. 10, No. 6, 2003, pp. 330-33.

[21] Cushman, Mary, et al. "Estrogen plus progestin and risk of venous thrombosis." *JAMA,* Vol. 292, No. 13, 2004, pp. 1573-80.

[22] Previtali, Emanuele, et al. "Risk factors for venous and arterial thrombosis." *Blood Transfusion,* Vol. 9, No. 2, 2011, p. 120.