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THROMBOEMBOLIC COMPLICATIONS IN PREGNANCY INCIDENCE, DIAGNOSIS AND MANAGEMENT

Athika Asharaf Hassan, Capros Hristina, Alkia Asharaf Hassan
USMF "Nicolae Testemiţanu", Republic of Moldova

ABSTRACT

The development of thromboembolic complications, including deep vein thrombosis (DVT) and pulmonary embolism (PE), in pregnancy is an major issue of obstetrical interest because of its potential developmental complication increases maternal mortality. The management of thromboembolic complication in pregnancy till now a days is an unsolved problems and requires a multidisciplinary approach involving obstetricians, hematologists, and other specialists. The management of thromboembolic complications in pregnancy typically involves a combination of anticoagulant therapy, close monitoring, and preventative measures. The objective of the study is To evaluate the most type of thromboembolic complications in pregnancy, To determine the clinical manifestation of thromboembolic complications in pregnancy, To evaluate the diagnosis of thromboembolic complications in pregnancy and To evaluate the management of thromboembolic complication in pregnancy.

KEYWORDS: '***Thromboembolic complications', 'pregnant women', 'DVT', 'PE' and 'management of thromboembolism in pregnancy'.***

INTRODUCTION

A rare but significant cause of sickness and mortality during pregnancy and the puerperium is venous thromboembolism. It has been estimated that it affects 1 in 1000 to 1 in 2000 pregnancies despite the fact that few research have made use of unbiased diagnostic methods. The treatment of venous thromboembolism in individuals who are not pregnant has changed significantly during the past 20 years. Furthermore, we now have a better grasp of how the coagulation system changes throughout pregnancy. Nonetheless, due to the absence of prospective clinical trials, the therapy of venous thromboembolism during pregnancy continues to be a contentious issue. We will provide a summary of our current understanding and a logical management strategy in this essay [1]

For a number of reasons, managing venous thromboembolism (VTE) during pregnancy is difficult. When compared to non-pregnant people, several diagnostic tests are less reliable in pregnant patients, and some radiologic treatments can be harmful to the fetus. The choices are not ideal when anticoagulants are necessary. Coumarins can harm the developing baby in several ways, including embryopathy. UFH and LMWHs are two types of heparins. can induce maternal thrombocytopenia and osteoporosis and need parenteral delivery, making long-term administration difficult. Although LMWHs are presumably less likely than UFH to result in thrombocytopenia and osteoporosis in pregnant women, it is yet unknown what dosages are best for these purposes [2]

The diagnosis of venous thromboembolism (VTE), as well as the management of individuals with a high risk of or existing VTE, can be complicated during pregnancy due to physiologic and anatomical changes. Similar to in non-pregnant patients, a precise objective test is necessary to confirm a clinical diagnosis of VTE. The procedures are mostly extrapolated from those used in non-pregnant people with adjustments to reduce the radiation dose and get around the limits of diagnostic testing in pregnancy because there haven't been many diagnostic investigations of VTE in pregnant women. UFH or LMWH is a low-molecular-weight heparin, administered typically throughout pregnancy subcutaneously and for 4 to 6 weeks following childbirth, are the main treatments for established VTE during pregnancy [3]

In both the short and long term, venous thromboembolism (VTE) in pregnancy is a significant source of morbidity. To lower maternal mortality and morbidity, effective primary prevention and acute therapy of VTE in pregnancy are crucial. Use of coumarins during pregnancy is linked to severe fetal and maternal hazards, notably those related to teratogenesis and bleeding. Coumarins cross the placenta. Unfractionated heparin (UFH) was the common anticoagulant used in pregnancy for a long time. Low-molecular-weight heparins (LMWHs) have taken the role of UFH in the treatment and prevention of acute VTE in women who are not pregnant [4]

The benefits of LMWHs over UFH include improved anti-Xa (antithrombotic) to anti-IIa (anticoagulant) ratios that lower the risk of bleeding; stable and predictable pharmacokinetics with increased bioavailability and half-life that enables less frequent fixed or weight-based dosing without the need for monitoring; subcutaneous administration; and less activation of platelets with less binding to platelet factor 4 that significantly lowers the risk of heparin (HIT).The 2% incidence of symptomatic heparin-induced osteoporotic fracture in pregnancy has been a serious issue with the widespread usage of UFH in pregnancies. A decreased risk of this fatal consequence is linked to LMWHs [5]

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PURPOSE

To Evaluate the clinic- paraclinical expression of thromboembolic complications in pregnancy and their management

OBJECTIVE

To evaluate the most type, to determine the clinical manifestation, to evaluate the algorithm of the diagnosis and to evaluate the management of thromboembolic complications in pregnancy.

METHODOLOGY

This study is a literature review that synthesizes and evaluates existing research on the topic thromboembolic complication in pregnancy: incidence, diagnosis and management

The aim is to review the thromboembolic complications in pregnancy, the most common thromboembolic complication in pregnancy, clinic- paraclinical and their management. The data extracted from the studies were analyzed and synthesized thematically, with a focus on the most common type, clinical manifestation, diagnosis and management of thromboembolic complications in pregnancy. In this article we included 10 studies from different countries.

STUDY	AUTHOR	No Of Patients	DVT and Percentage	PE and Percentage	Scoring Method	DIAGNOSIS Method	TREATMENT Method
Study 1	Lian Y, 2023 CHINA	302	282 (93.4%)	20 (6.6%)	RCOG model- 73% CAPRINI model- 22% WELLS score- 5%	CUS- 199 (70.5%) Contrast venography- 83(29.5%) CTPA- 13(65%) v/p scan- 7(35%)	LMWH – 282(93.4%) UFH- 20 (6.6%) Supportive care is recommended Follow up is also recommended
Study 2	Mohsen Ayyash, 2022 RIYADH	180	143 (79.5%)	37 (20.5%)	RCOG model	Doppler ultrasound- 87(60.9%) V/P scan- 9(24.4%) CTPA- 28 (75.6%)	-
Study 3	Naser Al-Husban, 2021 JORDAN	112	85 (75.9%)	27 (24.1%)	RCOG model	CUS- 68(80%) CTPA- 15(55.6%) V/P scan- 12(44.4%)	LMWH- 92(82.2%) UFH- 20(17.8%) Supportive care is recommended Follow up is also recommended
Study 4	De Gruyter, 2020 SINGAPORE	89	71 (79.8%)	18 (20.2%)	RCOG model	CUS- 54(76.1%) CTPA- 12(66.7%) V/P scan- 6(33.3%)	-
Study 5	Wei Zhang, 2020 CHINA	158	116 (73.5%)	42 (26.5%)	RCOG model	venous color Doppler-101 ultrasound (of the lower extremities 42 d after delivery.) (87.1%) CTPA- 33(78.6%)	LMWH- 95(60.2%) UFH- 63(39.8%) Supportive care is recommended

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Study 6	Mohammed A. Alsheef, 2020 SUADI ARABIA	180	150 (83.4%)	30 (16.6%)	RCOG model	Doppler ultrasound-52(34.6%) CUS-98(65.4%) CTPA-19(63.4%) V/P scan-11(36.6%)	LMWH-176(97.8%) UFH-4(2.2%) Supportive care is recommended Follow up is also recommended
Study 7	Awadalla Mohammed, 2019 AFRICA	78	62 (79.5%)	16 (20.5%)	-	CUS-51(82.3%) CTPA-11(68.7%)	LMWH-54(69.3%) UFH-24(30.7%) Supportive care is recommended
Study 8	Ryuji Kawaguchi, 2016 JAPAN	25	20 (80%)	5 (20%)	-	CUS-13(65%) V/P scan-3(60%)	LMWH-21(84%) Follow up is recommended
Study 9	Zahra Fardiazar, 2014 IRAN	81	45 (55.6%)	36 (44.4%)	-	CUS- 36 (80%) CTPA-28(77.8%)	
Study 10	Y. Dargaud, 2005 FRANCE	85	60 (70.5%)	25 (29.5%)	-	CUS at 13 weeks gestation-48(80%) CTPA-14(56%)	LMWH-61(71.8%) UFH-24(28.2%) Follow up is recommended

RESULTS

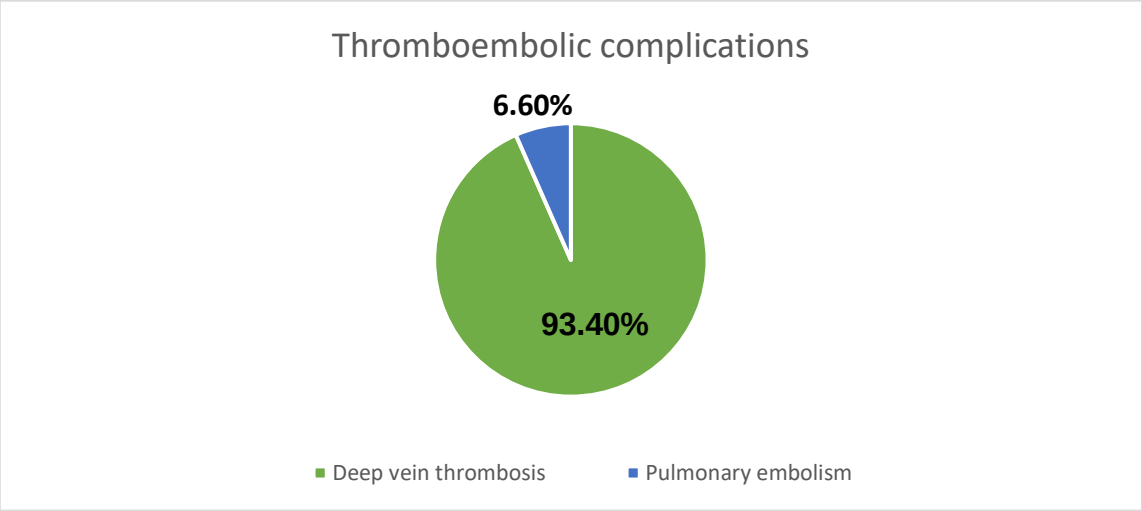

FIGURE 1: Incidence of Thromboembolic Complications

Thromboembolic complication developed in pregnancy were deep vein thrombosis from (93.4% to 55.6%) [OR=33.2] and 2nd most is Pulmonary embolism from (44.4% to 6.6%) [OR=16.4]

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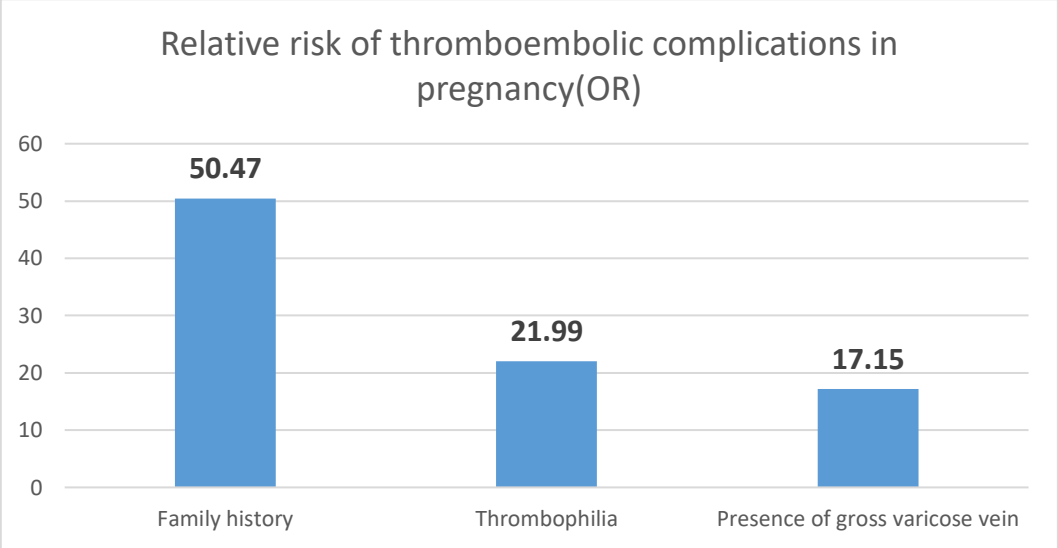

FIGURE 2: Relative Risk

The relative risk of thromboembolic complication in pregnancy increased if patient presented underlying conditions: family history (Odds ratio (OR) = 50.47), thrombophilia (OR = 21.99), presence of gross varicose veins (OR = 17.15)

Advanced maternal age: the relative risk of VTE in pregnant women over 35 years old has increased approximately 2-fold. A large cohort study in the United States found that maternal women aged 35-44 were twice as likely to develop VTE as non-pregnant women aged 25-34

obesity (BMI > 25 kg/m2) (OR=30.43) and Obesity (BMI > 30 kg/m2) (OR=42)

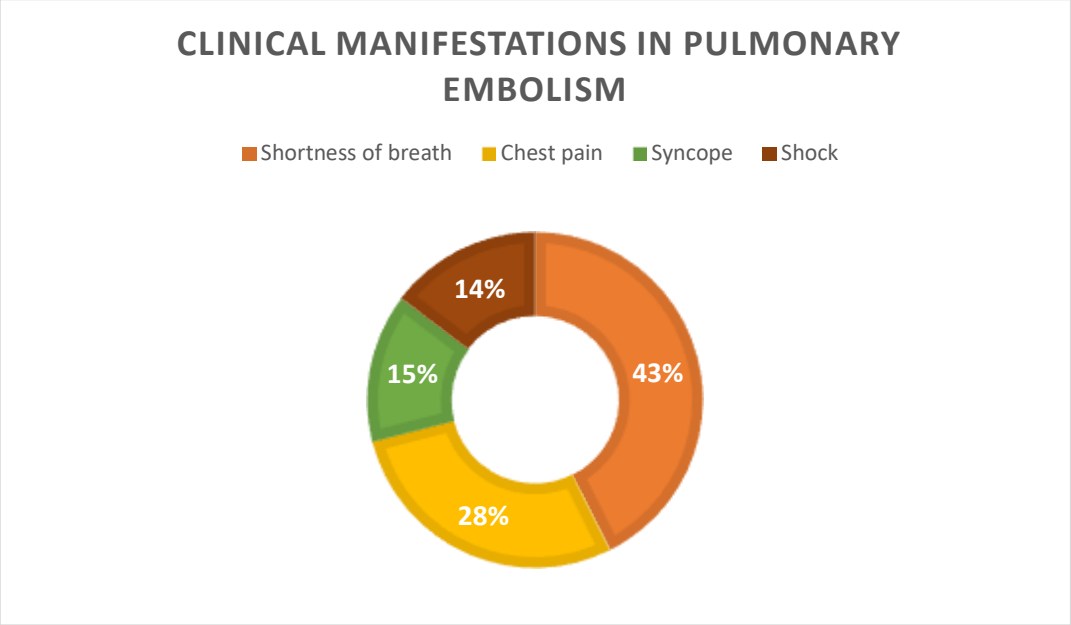

FIGURE 3: Clinical manifestation of PE

Symptoms of pulmonary embolism include: shortness of breath 43% (60% to 20.6%) OR=74.4, chest pain 28% (46% to 20.2%) OR=69.4, syncope 15% (39% to 20.6%) OR=65.4, shock 14% (34% to 20.2%) OR=62.7

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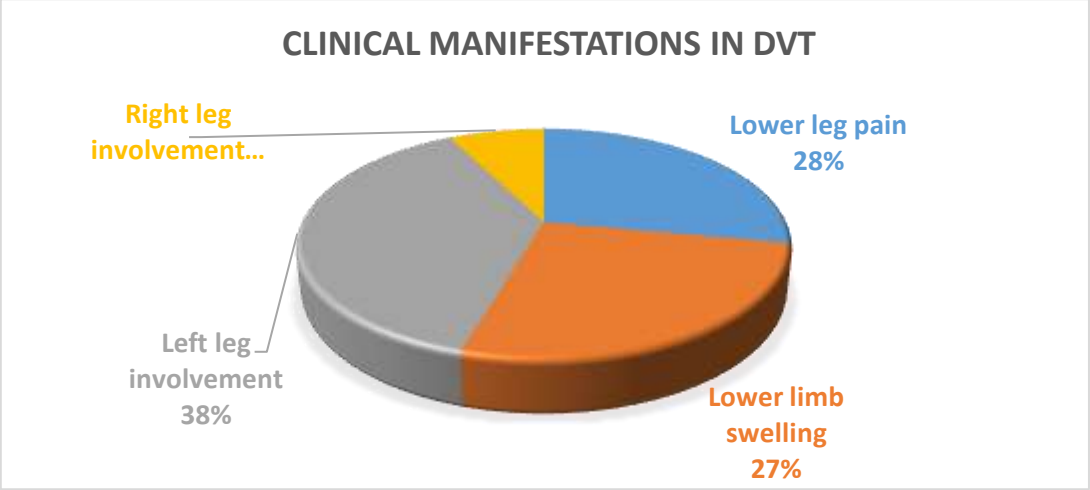

FIGURE 4: Clinical manifestations of DVT

The common clinical presentations in DVT include: lower leg pain 28% (OR=57.2), lower limb swelling 27% (OR=54.4), The left leg was involved in 38% (OR=77.4) of patients in whom the proximal site was the dominant site of involvement and right leg DVT was observed in 7% (OR=15.5) of patients.

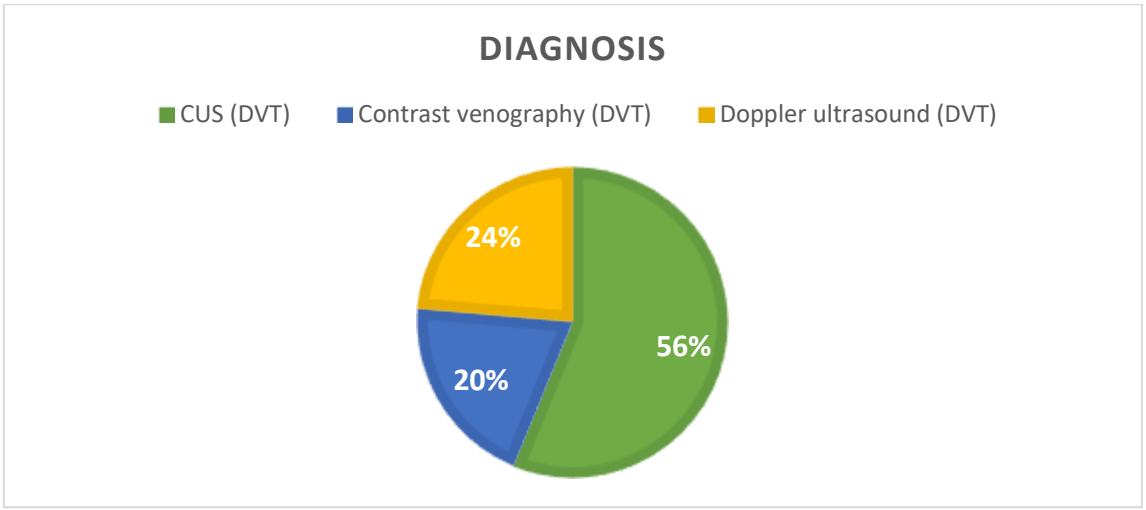

FIGURE 5: Diagnosis of DVT

The imaging studies required. The presence of clinical system diagnosis of DVT: compression ultrasound (82.3% to 56%) OR= 43.8, Contrast venography (29.5% to 22%) OR= 30, Doppler ultrasound (87.1% to 34.6%) OR= 36.7

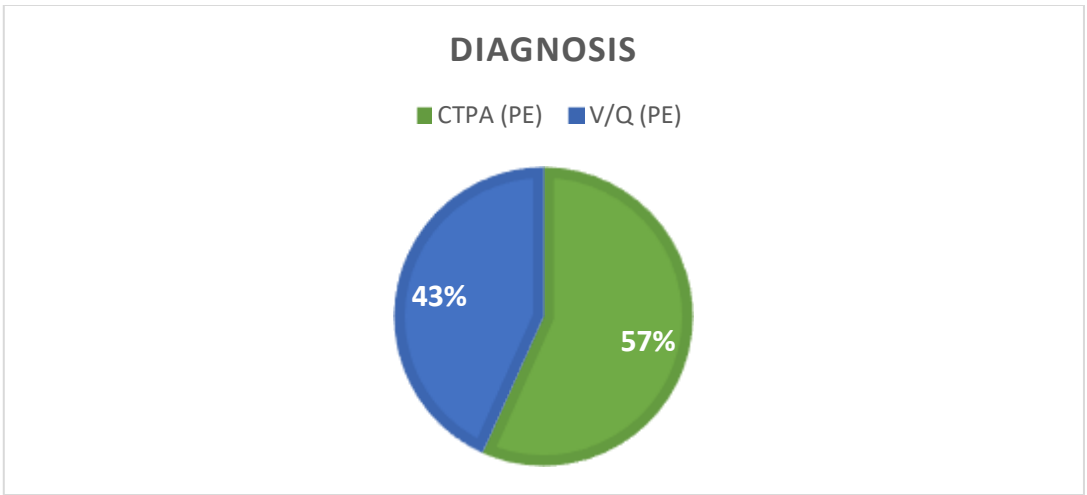

FIGURE 6: Diagnosis of PE

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Imaging studies of PE include: computed tomography pulmonary angiography (CTPA) (78.6% to 55.6%) OR= 58.6, ventilation-perfusion (V/Q) scanning (60% to 24.4%) OR= 44.6

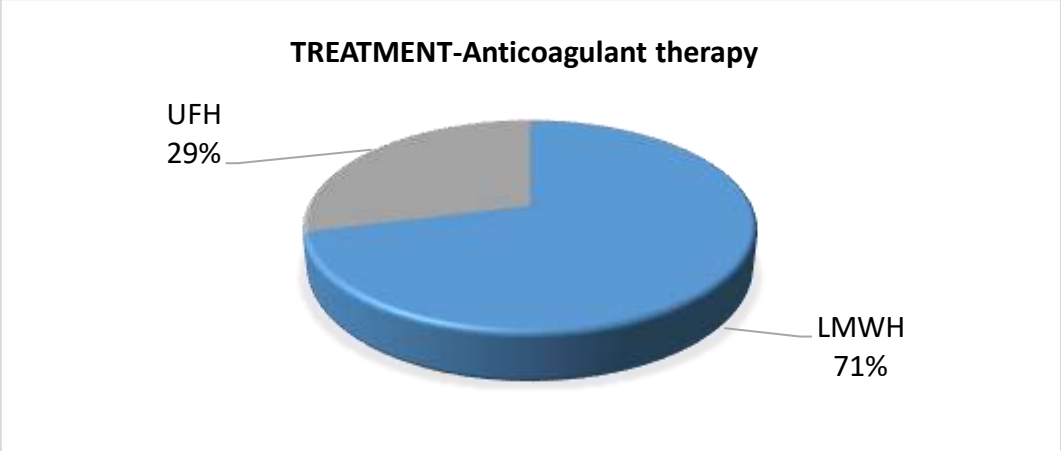

FIGURE 7: Treatment

The management of thromboembolic complications in pregnancy included: Anticoagulant Therapy like Low molecular weight heparin (LMWH) (97.8% to 60.2%) OR= 62.4 and Un fractioned heparin (UFH) (39.8% to 2.2%) OR= 43.6

Low molecular weight heparin (LMWH) (97.8%) 2,000-U injections daily as it was the drug of choice and According to RCOG guideline the recommended dose of LMWH for pregnant women with DVT is usually based on body weight and is adjusted as pregnancy progresses. The usual starting dose is 1 mg/kg of body weight given twice a day, and the dose may be adjusted based on regular monitoring of the patients' blood clotting levels.

Enoxaparin 40mg SC q24 h was administered to most of the patients as initial treatment for 6 to 8 weeks postpartum and compression stockings were given to all patients during the entire pregnancy. Follow-up lasted until 3months after delivery.

CONCLUSIONS

According to the study and analysis, managing thromboembolic problems in pregnancy is a complicated problem that demands for a multidisciplinary approach.

From my research, I studied 10 articles, from this I conclude that the most common type of Thromboembolic complication developed in pregnancy were deep vein thrombosis from (93.4% to 55.6%) [OR=33.2] and 2nd most is Pulmonary embolism from (44.4% to 6.6%) [OR=16.4].

The clinical manifestation of thromboembolic complications in pregnancy: Symptoms of pulmonary embolism include: shortness of breath 43% (60% to 20.6%) OR=74.4, chest pain 28% (46% to 20.2%) OR=69.4, syncope 15% (39% to 20.6%) OR=65.4 and shock 14% (34% to 20.2%) OR=62.7. The common clinical presentations in DVT include: lower leg pain 28% (OR=57.2), lower limb swelling 27% (OR=54.4), The left leg was involved in 38% (OR=77.4) of patients in whom the proximal site was the dominant site of involvement and right leg DVT was observed in 7% (OR=15.5) of patients. The diagnosis most used is compression ultrasound in DVT (82.3% to 56%) OR= 43.8 and CTPA (78.6% to 55.6%) OR= 58.6 in PE. The management of thromboembolic complication in pregnancy is Low molecular weight heparin (LMWH) (97.8%) OR= 62.4 2,000-U injections daily as it was the drug of choice, Enoxaparin 40mg SC q 24 h was administered to most of the patients as initial treatment for 6 to 8 weeks postpartum and compression stockings were given to all patients during the entire pregnancy. Follow-up lasted until 3months after delivery.

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Conflict of Interest Statement

The authors report no conflicts of interest.

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