

Incidence of Pulmonary and/or Systemic Thromboembolism in Pregnancy

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ABSTRACT: Pregnancy associate with thromboembolism is one of leading causes of maternal morbidity and mortality. Worldwide the incidence of pregnancy related venous thromboembolism is approximately 1 in 1500 deliveries. The arterial thromboembolism risk is increased from 3 to 4 fold and the risk of venous thromboembolism is five times higher in a pregnant that in a non-pregnant woman. With an appropriate prophylaxis and therapy, prevention of death from systemic thromboembolism in pregnancy necessitates a high index of clinical suspicion succeeded by a timely and accurate diagnostic approach. In pregnancy the clinical diagnosis of systemic thromboembolism is notoriously difficult due to the overlap of signs and symptoms between the pulmonary embolus with or without deep venous thrombosis. We performed a retrospective study of 86 pregnant women with Pulmonary thromboembolism (PTE) and Deep venous thrombosis (DVT) diagnosed between 2009-2015 in Obstetrics-Gynecology Clinic 1 at Emergency County Hospital of Craiova. Our study evaluated these cases considering frequency, maternal and fetus risk associated with thromboembolism. In 6 years we had 35 women diagnosed as PTE, 8 women diagnosed as DVT and PTE, and 43 patients diagnosed as DVT. The underlying disease in our study was hypertension and the most frequent symptoms reported were dyspnea and limb swelling.(100%).During the third trimester of pregnancy the incidence of PTE was 45% and DVT 57%. 12 cases of DVT were related to thrombophilia. Also we found 25 % of PTE that occurred after cesarean and 8 % of PTE after vaginal delivery. We notice that vaginal delivery is safer than cesarean surgery. Also the importance of third trimester of pregnancy and postpartum it is evident.

KEYWORDS: pregnancy, deep vein thrombosis, pulmonary embolism

Introduction

Thromboembolic events during pregnancy are reported frequently because this period is characterized by hypercoagulability [1].

At pregnant women compared with non-pregnant women of the same age the risk of both arterial and venous thromboembolic occurrence is much higher. Approximately 20% of these events are arterial and the other 80% are venous [2].

The connection between pregnancy and venous thromboembolism (VTE) has been inquired for more than four decades.[3]

The annual incidence of VTE in pregnancy is estimated at 1 in 1200 pregnancies but it is also related to age, for instance in women under 35 it

is about 1 in 1600 pregnancies but over the age of 35 it is about 1 in 800.[4].

The mortality is about 1–2% . Pregnancy-associated death from thromboembolism occurs once in around 70,000 pregnancies. [5]

Due to hormonal influences on vascular tone and compressive effects on veins by the enlarging uterus, DVT (deep venous thrombosis) in pregnancy generally presents in the lower extremities, with a predisposition for the left leg (70 to 80%).[6,7]

In contrast to their presentation in non-pregnant patients, DVTs are often isolated to the iliac and/or femoral vein during pregnancy (61%) [8].

Consequently diagnostic approaches advocated for use in non-pregnant patients require modification in pregnancy. The arterial

thromboembolism risk (strokes and also heart attacks) is increased from 3 to 4 fold and the risk of venous thromboembolism (VTE) is increased up to 5 times.[9]

The risk of VTE could be superior in the third than in the first two trimesters [10] while an increased risk of VTE is obviously present from the first trimester [11] before anatomic changes of pregnancy to occur.

Compared to pregnancy the risk of VTE to occur in postpartum is even higher. The risk in the first 6 weeks is from 20 up to 80 higher compared to the first week when the risk is up to 100 higher [9].

Seventy-five percent to 80% of pregnancy cases associated with VTE is deep vein thrombosis (DVT) and 20% (4) is pulmonary embolism (PE). Fifty percent of the venous thromboembolic events occur during pregnancy and fifty percent postpartum [12].

Deep venous thrombosis (DVT) begins in veins of the calf and thigh in pregnancy, as same like at non-pregnant women, but a surprising tendency exists for involvement of the left lower extremity.

It is known that the normal pregnancy changes the state of hemostasis [13].

Pregnancy is considered a typical example of Virchow's triad (hypercoagulability, venous stasis, and vascular damage) and together these factors lead to an increased incidence of venous thromboembolism [14].

The hypercoagulability of pregnancy has probably evolved to protect women from hemorrhage at the time of miscarriage or childbirth [15].

Beside hypercoagulability, there are some physiological changes that accompany pregnancy and childbirth like hormonally induced increased venous capacitance and decreased venous outflow [16] mechanical obstruction by the uterus, decreased mobility and vascular injury, likely important factors in the development of pregnancy-associated VTE [17].

The most common risk factors for VTE in pregnancy are history of thrombosis and thrombophilia.[18,19].

Thrombophilia is present in twenty percent to fifty percent of women who experience VTE during pregnancy or the postpartum period.[20]

The objective of the present study was to evaluate the incidence, maternal and fetus risk of thromboembolism among pregnant women.

Material and methods

This retrospective study was conducted on medical records of pregnant women diagnosed with venous and arterial thromboembolism at the Emergency Hospital Craiova at the Obstetrics-Gynecology Clinic 1 between 2009 and 2015.

We accessed all the medical records.

The total suspected cases of VTE was 102 cases, and after we did the accurate evaluation of every medical record the number decreased to 86 cases. A checklist was designed including these parts:

- risk factors,
- symptoms of VTE,
- pregnancy status,
- previous pregnancy,
- thrombosis location,
- maternal complication, and labor and fetus

outcomes

Risk factors examined were included:

- patients age,
- parity,
- history of abortion or/and history of multiple births,
- past medical history ,
- past history of VTE during the period of pregnancy or non-pregnancy periods
- antiphospholipid syndrome,
- obstetric history,
- and also mode of delivery.

We included also tests of thrombophilia.

The determined period for diagnosis of VTE was considered the first six weeks after delivery. Diagnostic of pelvic venous thrombosis was set by changes in the flow of femoral veins by Color Doppler Sonography and the diagnosis of PTE with CT scan or MRI. We analyzed fetus outcomes based on anomalies, also APGAR score of infant and the neonatal complications during hospitalization.

We used descriptive statistic including frequency and percents for a better data analysis.

Results

Patients were diagnosed with the following complications: 35 women (41%) with PTE; 8 women (9%) with DVT and PTE; 43 women 50% with DVT (Fig.1).

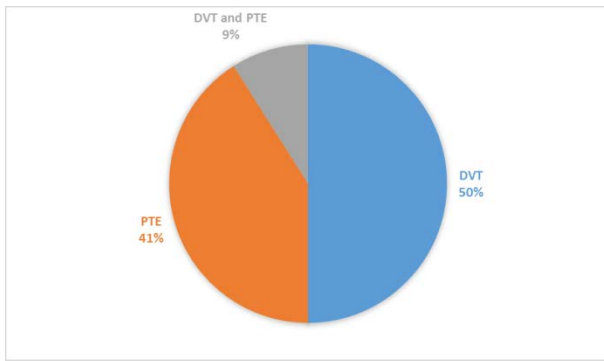


Fig.1. Incidence of thromboembolic events

The average age in the studied group was of 27 years. 10 women (11,62%) did not have previous pregnancies, 22 women had a history of one previous pregnancy (25,58%), 31 women had a history of two previous pregnancies (36,04%), and the rest of them had more than 3 previous pregnancies (26,74%) (Fig.2).

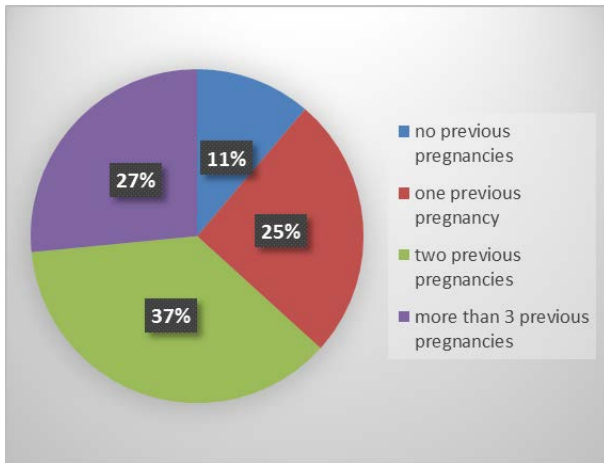


Fig.2. Previous pregnancies

15 women did not have any history of previous abortion (17,44%), 17 women who had one abortion (19,74%), 32 women who had two abortion (37,20%) and the rest of them had three or more previous abortion (25,58%) (Fig.3). 8 women had a history of twin pregnancy (9,30%), two of them (2,32%) had a history of triple pregnancy, and the rest of them had a pregnancy with a single fetus (88,27%) (Fig.4).

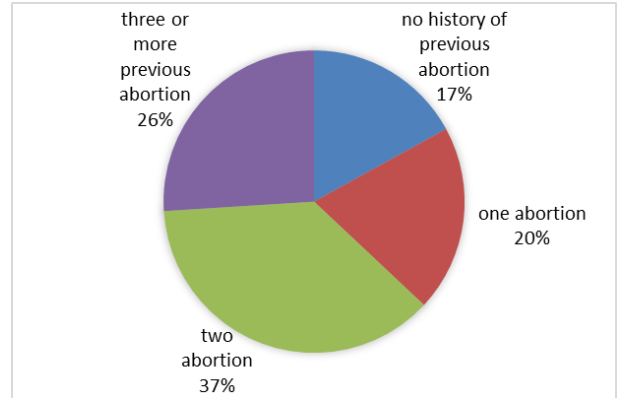


Fig.3. History of abortion

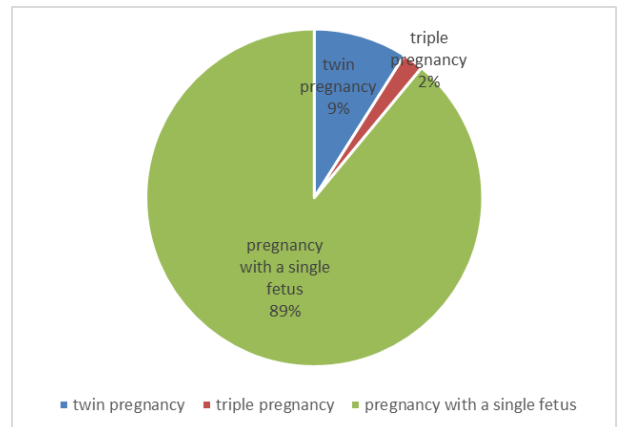


Fig.4. Single, twin, triple pregnancy

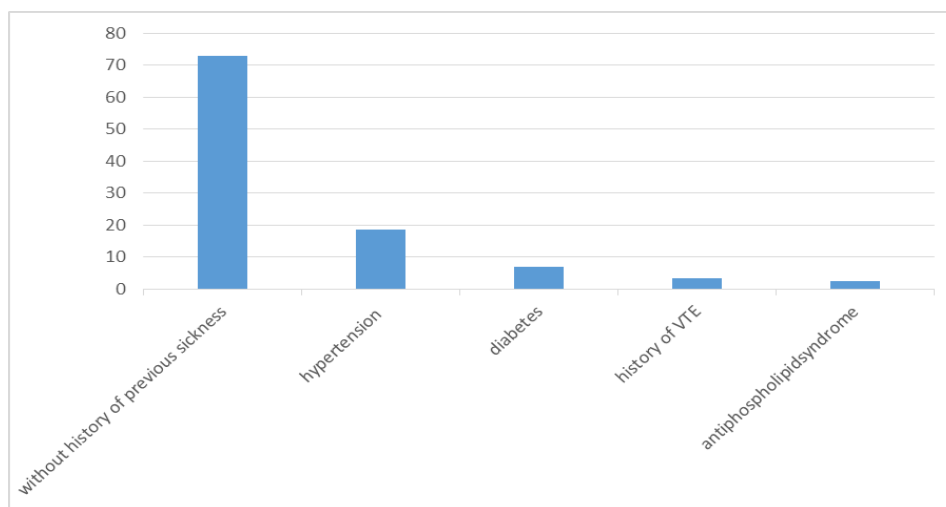


Fig.5. Risk factors

63 women (73%) did not have a history of previous sickness and the most frequent disease was hypertension 18.5% that include chronic hypertension 8.2% and also hypertension induced by pregnancy 9.3%. (Fig.5).

Risk factors: we found 6 patients with diabetes (6,9%), 3 patients with history of VTE in non-pregnancy period (3,4%), 5 patients with history of VTE during pregnancy (5,81%) , two women with anti-phospholipid syndrome. Obstetric history at patients: without obstetric complication we found 71 patients (82%), 8 preterm birth (9,3%), 2 intrauterine fetal death (2,32 %), 3 women with preeclampsia (3,4%) and 2 with decollement.

Considering all patients with a history of previous sickness and/or risk factors, 8 out of 43 patients with PTE and 19 out of 51 patients with DVT were affected. The difference between PTE and DVT is statistically significant Chi square test's p value being 0.046<0.05.

In the first trimester of pregnancy we found the occurrence of PTE in two women (2.32); in

4 women (5%) were in the second trimester of pregnancy; in 39 women (45%) were in third trimester of pregnancy; and in 29 women (33%) were during or after delivery (25% after cesarean and 8% after vaginal delivery). Also, 8 cases of DVT (9%) occurred in first trimester of pregnancy; and in 11 second trimester (12.7%), 48 cases in the third semester (57%), and 7 cases after delivery (8%). The difference between the occurrence of PTE and DVT, as analyzed with Chi square test of independence, was statistically significant, with a p value of 0.000094 <0.001, with shows a highly significant result. Thus, we can conclude that PTE tend to occur later, during third semester or during and after delivery, while DVT occur earlier, with a peak during third semester (Fig.6).

In 11 cases (12.7%) the DVT occurred in the right leg, in 28 cases (32.5%) occurred in the left leg and in 5 cases (5.8%) in both legs.

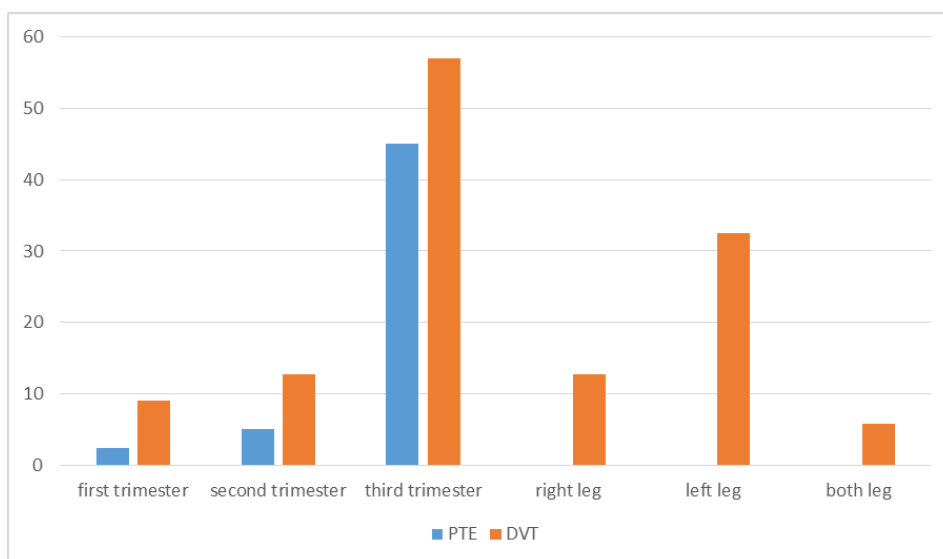


Fig.6. Incidence of PTE and DVT depending on trimester of pregnancy and location

All the patients with VTE reported dyspnea. Among 31 DVT patients, limb swelling was evident in all of them.

Apgar scores of infant was at 8 or above. We didn't have any cases of neonatal abnormalities and bleeding.

In the study in 12 cases of women diagnosed with DVT the thrombophilia diagnosis was confirmed.

Discussion

Fifteen percent to twenty-five percent of thromboembolic events in pregnancy are recurrent events [21]. Risk of recurrent VTE seem higher for women with a family history and deficiencies of the naturally occurring anticoagulants, especially type 1 antithrombin deficiency. [22]. The clinical diagnosis is more difficult at pregnant women that at a non-pregnant women because of the signs and

symptoms like swelling and leg discomfort which are common in pregnancy. Also, PE is more problematic because dyspnea and tachypnea are also common in pregnancy. In non-pregnant women, symptoms like tachypnea, dyspnea, chest pain (pleuritic), apprehension appear in at least 50% of patients.

In our study, all woman diagnosed as PTE and DVT reported dyspnea and swelling of the lower limb. So, we considered to pay more attention to any of these symptoms at any pregnant women.

We found 45% of all PTE and 57% of DVT events happen in the third trimester of pregnancy. This demonstrate us the importance of considering this period the prevention and early detection of VTE among pregnant women.

We also notice that DVT event occurred in 43 patients, 11 cases in right leg and 28 cases in left leg. This may be due to the pressure of right iliac artery and the ovarian artery on left iliac vein. Both of these arteries pass only on the left side of the vein.[23]

Except from the obviously serious short-term consequences, there are also results that pregnancy associated VTE give long-term complications such as post-thrombotic syndrome (PTS) [24] and poor quality of life.

Conclusions

Women during pregnancy are at an increased risk of both venous and arterial thromboembolism. The main reason is hypercoagulability. Risk factors include a history of thrombosis, thrombophilia, certain medical conditions, and some complications of pregnancy and childbirth.

Venous thromboembolism (VTE) is the leading cause of maternal deaths in the developed world, but fortunately it is still a rare event. Pulmonary thromboembolism in pregnancy is associated with an important maternal morbidity and mortality. This might lead to targeting the right population for prevention, ensuring that diagnosis is suspected and well enough investigated, and initiating timely and best possible treatment of this disease. [14]

Although the overall pregnancy-related VTE incidence seems to be low, it is significantly higher than in nonpregnant women, and a significant correlation with increasing age has been detected in all women. [25] It should always be considered in the presence of suspicious symptoms and signs and confirmed by appropriate diagnostic exams, including VPS

or CT. Oral anticoagulation should be begun immediately, and thrombolysis should be considered in cases of hemodynamic instability.[26]

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