

Clinical Study of Association of Risk Factors of Thromboembolism during Pregnancy and Puerperium

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Abstract

Background: Pregnancy is characterized by a state of hypercoagulability. Considering the burden of venous thromboembolism and its impact on fetomaternal health, it is imperative to early identify risk factors for pregnancy related thromboembolism.

Aim & objectives: To identify risk factors for pregnancy related venous thromboembolism.

Method: An institution based prospective observational study was conducted in SZH Hospital Bhopal for the time period of one year. Questionnaire and multiple investigations done on antenatal admitted with venous thromboembolism.

Result: Study subject who were multigravida (60.9%) were at higher risk as compared to primigravida (39.1%). Subject with associated co-morbidity such as pre-eclampsia (29.3%), gestation hypertension (13%) were at higher risk than normal antenatal.

Conclusion: The study showed that unidentified multiple risks factors of thromboembolism are associated with pregnancy. Our results can be a guide to policymakers to

include prevention of venous thromboembolism among pregnant women in Maternal and child healthcare programs.

Keywords: Thromboembolism, risk factors, pregnancy, early diagnosis.

Introduction

Pregnancy is a characterized by a state of hypercoagulability, in which all the components of Virchow’s triad i.e. venous stasis, hypercoagulability as well as vascular damage are higher. This risk of hypercoagulable state continued even during the puerperal phase i.e. till 42 days after delivery.¹ The hypercoagulable state in pregnancy and puerperium is attributed to increase in coagulation factors along with reduction in anticoagulant factors. The risk of venous thromboembolism is 5 times higher during pregnancy and 60 times higher during postpartum period as compared to non-pregnant states.² The factors associated with high risk of venous thromboembolism during pregnancy and postpartum period include advance maternal age, multi parity, obesity, cesarean section, pre-

eclampsia, previous venous thromboembolism, varicose veins, previous history of major abdominal surgery and inherited thrombophilias.³ The RCOG recommended criteria to classify the females into three strata i.e. high, intermediate and low based upon the risk of thromboembolism.⁵ Considering the burden of venous thromboembolism and its impact on fetomaternal health, it is imperative to early recognize and effectively treat this complication during pregnancy as well as postpartum period.

Methodology

Study area, setting and period

The study was conducted in SZH, which comes under Obstetrics and Gynecology department of Gandhi Medical College Bhopal Madhya Pradesh. This study was conducted from 1 July 2020 to 30 June 2021.

Study design and population: Institutional based prospective study was conducted at department of

Result

Table 1: Incidence of Venous thromboembolism in Obstetric Patients

Total number of Obstetric admissions during the study period	Total cases of Venous Thromboembolism among Obstetric admissions	Incidence of Venous Thromboembolism
14139	92	0.65%

Table 2: Distribution of Patients according to associated risk factors

S.No.	Associated Risk Factors	Number Patients	of	Percentage
1	Prolonged Hospital stay	19		20.70%
2	Obesity	17		18.50%
3	Excessive Blood Loss	12		13.00%
4	Immobility	11		11.90%
5	Past Surgical History	5		5.40%
6	History of Smoking	3		3.30%
7	Past history of Venous Thromboembolism	2		2.20%
8	Varicose Vein	2		2.20%

Obstetrics and Gynecology Sultania Zanana hospital Bhopal.

Sample Size and Sampling Technique

All pregnant women and women during Puerperium developing venous thromboembolism fulfilling inclusion criteria during specified study period were included using convenient sampling.

Data Collection Method

The study was preapproved by Institute's ethical committee. All the females fulfilling the inclusion criteria and willing to participate in the study were enrolled. Detailed history regarding mode of presentation, duration of amenorrhea, history of bleeding or leaking per vaginum etc. was obtained and documented. Obstetric history with obtained in detailed with mode of previous delivery as well as complications if any in previous pregnancies.

Table 3: Distribution of patients according to associated obstetric co-morbidities

S.No.	Associated Obstetric Co-morbidities	Number of Patients	Percentage
1	Pre Eclampsia	27	29.3%
2	Gestational Hypertension	12	13.0%
3	Prolonged labour	5	5.4%
4	Multiple Gestation	3	3.3%

Table 4: Distribution of patients according to associated Medical Co-morbidities

S.No.	Associated Medical Co-morbidities	Number of Patients	Percentage
1	Anaemia	26	28.3%
2	Chronic Hypertension	6	6.4%
3	Gestational Diabetes Mellitus	4	4.8%

Discussion

The study aimed to know the incidence, associated risk factors of venous thromboembolism during pregnancy and puerperium and its effect on fetomaternal outcome.

During our study period, 92 patients had venous thromboembolism. Out of which, 83 patients had pulmonary embolism and 9 patients had deep vein thrombosis.

Associated Risk Factors

Table 5: Showing associated risk factors as compared with other authors

Sn.	Author	Percentage
1	Tomoko Adachi et al	Most common risk factor found was prolonged bed rest
2	E.L. Simpson et al	Blood group A, multiple pregnancy, caesarean section, cardiac disease, delivery at gestational age of <36 weeks, a body mass index of ≥ 25 , or more and maternal age of 35 or over were all found to increase incidence of venous thromboembolism
3	Robert B Gherman et al	Most common risk factor found in post-natal period was C/section
4	Jean Christophe Gris et al	History of venous thromboembolism 0.4% Family history of VTE 1%

In present study, majority of the study participants had prolonged hospital stay (20.7%), followed by obesity (18.5%) followed by excessive blood loss (13%), immobility (11.9%), past surgical history (5.4%) and past history of venous thromboembolism and varicose vein were (2.2%) each. Similar to our result also reported prolonged bed rest as most common risk factor. According to results reported by, most common risk factor found in post-natal period was C/section. reported past history of venous thromboembolism as most important risk factor for thromboembolism. Admission to hospital must be considered as potentially one of the important risk factor as the risk of venous thromboembolism during admission is much more than the risk outside the hospital. Obesity acts as an independent risk factor for venous thromboembolism. Obesity promotes chronic inflammation and impaired fibrinolysis, both of which lead to increased risk of

thrombosis. The additional abdominal adiposity and persistently elevated intra-abdominal pressure further restrict venous return above the effects already exerted by the weight of the gravid uterus. Challenges with ambulation and altered mobility may result in relative inactivity, further hindering venous return and potentiating VTE risk. Women with previous VTE have an increased risk of recurrence in pregnancy and postpartum. Women with previous VTE should be offered pre pregnancy counselling and a prospective management plan for thromboprophylaxis in pregnancy should be made. Those who become pregnant before receiving such counselling should be referred at the earliest opportunity in pregnancy to a clinician with expertise in thrombosis in pregnancy. All women with prior VTE should receive postpartum prophylaxis as this is the period of greatest risk.

Associated obstetric co-morbidities

Table 6: Showing associated obstetric co-morbidities as compared with other authors

Sn.	Author	Percentage
1	Alyshah Abdul Sultan et al	Preeclampsia/Eclampsia 0.5% Gestational Hypertension 1.7% Multiple Gestation 1.7%
2	Dripta Ramya Sahoo et al	Preeclampsia 6.2% Eclampsia 0.18% Gestational HTN 3.5%
3	W S Chan et	Preeclampsia 17.6% Multiple Gestation 6%
4	M Knight et al	Multiple gestation
5	Jean Christophe Gris et al	Preeclampsia 2.5%

In present study, hypertensive disorder of pregnancy (Gestational Hypertension (13%), Pre- Eclampsia (29.3%)) were most commonly seen. Prolonged labour and multiple gestation were found in (5.4%) and (3.3%)

respectively. In accordance with our results, also reported hypertensive disorder of pregnancy as most common obstetric comorbidity associated with venous thromboembolism. Although in contrast to this finding,

reported multiple gestation as most common associated obstetric co-morbidity with venous thromboembolism. In our study, women with hypertension or preeclampsia during pregnancy had a higher risk of VTE, both during pregnancy and postpartum period. The risk of VTE was higher in women with preeclampsia than in women with hypertension during pregnancy. These findings support

Associated Medical co-morbidities

Table 7: Showing Associated Medical co-morbidities as compared with other authors

Sn.	Author	Percentage
1	Dripta Ramya Sahoo et al	Anaemia 10%
2	Jean Christophe Gris et al	Anaemia 7.2% Gestational DM 5.1% Pre-existing chronic hypertension 5.7%

In present study, Anaemia was present in 28.3% of study participants followed by chronic hypertension in 6.1 % and gestational diabetes mellitus in 4.8%. Anaemia was most common medical co-morbidity associated with venous thromboembolism. Similar results were reported by .Anaemia, especially when caused by iron deficiency, predisposes to venous thromboembolism mainly by inducing thrombocytosis, which can lead to a hypercoagulable state. Sickle cell disease, as well as other chronic haemolytic anemias are characterized by a hypercoagulable state. Gestational diabetes mellitus may be complicated by microvascular occlusive disease, manifest as diabetic retinopathy, nephropathy or neuropathy. The same process that causes such arterial vascular disease among persons with diabetes has been suggested to cause VTE.

Conclusion

Demonstrated a need for joint interdisciplinary approach in cases of pregnancy complicated with venous thromboembolism and also higher risk of maternal morbidity and mortality in unbooked patients. During pregnancy and puerperium, women are at an increased

the hypothesis that hypertensive complications of pregnancy entailing both hypertension during pregnancy and preeclampsia reflect an underlying predisposition to vascular disease, including VTE. Enlarged pregnant uterus in twins may cause obstruction of IVC (Inferior vena cava) leading to venous stasis and its complications.

risk of venous thromboembolism. Among pregnant women, the highest risk period for venous thromboembolism in particular is during the postpartum period. We aimed to fill in the gaps in current knowledge of risk factors for venous thromboembolism in pregnancy in this study. Women with certain medical conditions like Anaemia, chronic hypertension, gestational diabetes mellitus and women with obstetric complications appear to be at increased risk. Routine venous thromboembolism risk assessment could help identify at-risk women and minimise venous thromboembolism in pregnant women. During the antenatal and postnatal period, we believe that all pregnant women should undergo risk assessment of factors for Venous thromboembolism. Our results can be a guide to policymakers to include prevention of venous thromboembolism among pregnant women in maternal and child healthcare programs, which can lead to averting the morbidity associated with this disease on women’s health and pregnancy outcomes as well as it’s associated mortality.

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