

Shortened Coagulation Profile in Pregnancy

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Abstract

Original Research Article

Introduction: Hyper-coagulation and low grade disseminated intravascular coagulation exists during the entire period of pregnancy and immediate postpartum period. The hormonal changes in pregnancy maintains the placental function during the entire pregnancy and also during delivery, this is achieved by the significant changes in coagulation system during pregnancy; increases in levels of clotting factors, decreased concentration of anticoagulants and diminishing fibrinolytic activities, leading to the state of hypercoagulability. **Study and result:** The study was done in Central lab, Department of Pathology of our Institute. In this study, the PT and APTT levels of 150 pregnant women during different trimesters of pregnancy and labor were studied and we got a outcome of shortened profile in 104 patients out of which cases with shortened PT is 34%, shortened APTT is 51%, shortened PT and APTT is 15%. **Implication:** With the knowledge of the reference level, Shortened APTT independently predicts the first episodes and also subsequent recurrence of venous thromboembolism (VTE) and Post-partum hemorrhage.

Keywords: Coagulation profile, pregnancy.

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INTRODUCTION

Hyper-coagulation and low grade disseminated intravascular coagulation exists during the entire period of pregnancy and immediate postpartum period [1]. The hormonal changes in pregnancy maintains the placental function during the entire pregnancy and also during delivery, this is achieved by the significant changes in coagulation system during pregnancy; increases in levels of clotting factors, decreased concentration of anticoagulants and diminishing fibrinolytic activities, leading to the state of hypercoagulability [2].

Concentrations of coagulation factors V, VII, VIII, IX, X, XII and von Willebrand factor are significantly increased in pregnancy along with increased concentration of plasma fibrinogen 2. These changes in coagulation and fibrinolysis are attributed to estradiol induced alterations of triglycerides [3]. Prothrombin time and activated partial thromboplastin time respectively measures the extrinsic and intrinsic pathway of coagulation [4].

Activated partial thromboplastin time is used to assess the coagulation disorders in patient with

abnormal bleeding due to deficiencies in clotting factors, monitoring anticoagulant therapy and detecting inhibitors of blood coagulation [5].

Recent studies suggest, a shortened activated partial thromboplastin time might actually reflect in-vivo events that might be associated with hypercoagulability. Also shortened activated partial thromboplastin time has long been thought as an artifact secondary to problematic blood collection, storage or processing leading to in-vitro activation [6].

Previous studies done have documented a shortened activated partial thromboplastin time levels during pregnancy [7, 8], this can be explained by increase in levels of F V, VIII, IX and XII [8]. Authors have also formulated normative value of coagulation parameters according to the period of gestation [9-11].

AIM

To find the prevalence of shortened prothrombin time (PT) and activated partial thromboplastin time (APTT) in pregnant women.

METHODOLOGY

Study design: Cross sectional Study.

Study Setting: Sri Venkateshwaraa medical college hospital and research Centre, Puducherry.

Study population

Antenatal mothers attending the OPD, Department of Obstetrics and Gynecology

Inclusion criteria

Pregnant women at any gestational age

Exclusion criteria

- Women with active bleeding
- Antenatal haemorrhage during present/past pregnancy
- Personal/ family history of known bleeding diathesis
- History of taking anticoagulants

Sample size: Period Sample

All the women attending the outpatient department during the study Period (2 months) fulfilling the eligibility criteria will be included.

Duration: 2 months

Procedure: The study was done in Central lab, Department of Pathology of our Institute. All pregnant mothers attending the OPD in Obstetrics department were explained about the study and written informed consent was obtained. Clinical details of the pregnant women was taken and categorized as group I, II and III based on their trimester.

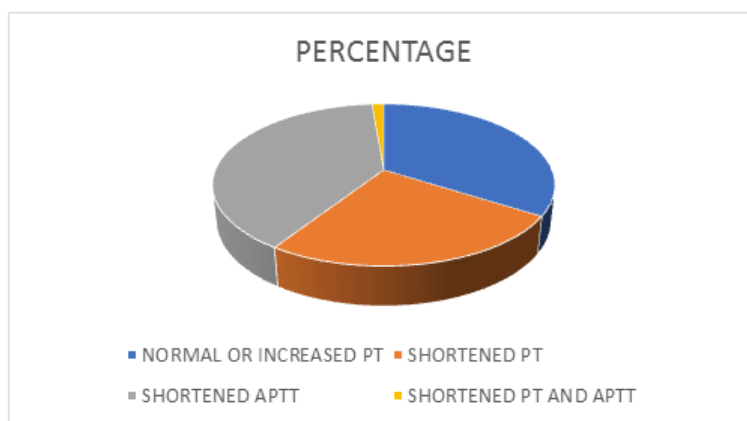
Blood Sample Collection: Under aseptic precautions, 2ml of venous blood was drawn from the ante-cubital vein and stored in Sodium citrate (3.2%) vacutainer, with proper labelling and analyzed within thirty minutes of collection.

Sample Analysis: The collected samples were centrifuged for 15 minutes at 2000 rpm and the plasma was collected and analyzed with ERBA ECL 105, Semiautomated coagulometer. PT and APTT values were obtained.

Quality Control: The Coagulometer is under external quality control program of CMC, Vellore. The internal quality check is done routinely by running the quality control samples with each batch of test samples.

STATISTICAL ANALYSIS: N=150

PT/APTT	NUMBER	PERCENTAGE %
NORMAL OR INCREASED	46	31
SHORTENED PT	34	23
SHORTENED APTT	55	36
BOTH SHORTENED	15	10



S. NO	PREGNANCY STAGES	SHORTENED PT	SHORTENED APTT	BOTH PT AND APTT SHORTENED	TOTAL
1.	1-2 TRIMESTER	4	5	3	12
2.	3 RD TRIMESTER	25	46	10	81
3.	LABOUR	5	4	2	11
4.	TOTAL	34	55	15	104

RESULT

In this study, the PT and APTT levels of 150 pregnant women during different trimesters of pregnancy and labor were studied and we got a outcome of shortened profile in 104 patients out of which cases with shortened PT is 34%, shortened APTT is 51%, shortened PT and APTT is 15%.

REVIEW OF LITERATURE

- SarikaS *et al*. [1]. In New Delhi, 2016, conducted a study to assess the prevalence of shortened prothrombin time and activated partial thromboplastin time in pregnant women. The results of the study were Among 173 pregnant women, 71.7% were detected to have shortened PT, APTT or both. The commonest abnormality was an isolated shortened aPTT.
- Mina A *et al*. [12] conducted a study on laboratory evaluation into the short APTT (2010). The results of the study were on patients presenting with short APTT' in reflective of complex hyper coagulant milieu that could feasibly contribute to thrombotic risk.
- Ibeh N *et al*. [7] in 2015 conducted a study at Nigeria, to evaluate the influence of normal pregnancy on blood coagulation and to explore changes in activity from first through the third trimester. The result of the study was "The means of APTT were significantly lower in the first, second and third trimester compared with controls".
- Hammerova H *et al*. [8] in 2014 conducted a study to establish the physiologic changes in haemostasis during pregnancy among 148 pregnant women. The results of the study were PT, APTT and INR were significantly shorter.

CONCLUSION

The present study shows a very high prevalence of shortened PT and APTT during 3rd trimester of pregnancy and labor when chances of bleeding are highest. Further studies with larger cohorts and other coagulation parameters are required to predict clinical outcomes in pregnant women with shortened coagulation profile.

IMPLICATIONS

With the knowledge of the reference level, Shortened APTT independently predicts the first episodes and also subsequent recurrence of venous thromboembolism (VTE) and Post-partum hemorrhage. Thrombophilia predisposes women for an increased risk of developing both early and late complications in pregnancy, which includes pre-mature rupture of membranes (PROM), Pre-eclampsia, and intra uterine growth restrictions.

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