ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

KEY WORDS:

STUDY OF MATERNAL SERUM C REACTIVE PROTEIN IN 2ND TRIMESTER OF PREGNANCY IN PREDICTING PRETERM LABOUR

Dr Anupama Assistant Prof. Patna Medical College

ABSTRACT

AIM

To study the association between maternal serum C reactive protein in early 2nd trimester of pregnancy and preterm labour.

INTRODCTION

preterm labour is a principal contributor to perinatal mortality and morbidity. Despite recent advances in perinatal medicine, the problems of preterm delivery continue to frustrate satisfactory reproductive outcome. However real reduction in preterm delivery rate will occur only through an improved understanding of the physiology of labour, identification of patients at risk, prevention and early detection and treatment of preterm labour. Although the pathophysiology of preterm delivery remains unknown, accumulating evidence suggests that subclinical infections and chronic inflammation may account for a majority of preterm deliveries'. C reactive protein (CRP) is a sensitive marker of inflammation that remains stable in serum(2). The maternal concentration of CRP has been studied as an aid to diagnosing subclinical infections(3). In this study the association between maternal serum CRP levels in early 2nd trimester of pregnancy and incidence of subsequent preterm delivery among a cohort of singleton pregnant women has been studied.

MATERIALS AND METHODS

A prospective study was done on a cohort of 324 women. Maternal serum samples were collected between 13 to 20 weeks of gestation and the CRP levels were estimated by slide agglutination test with CRP latex reagent. These patients were divided into two categories based on the CRP liters. CRP positive (>0.6mg/dl) and CRP negative (<0.6mg/dl). They were then followed up till the delivery and the incidence of Preterm labour, mode of delivery, neonatal birth weight and APGAR score was assisted information group.

- **Inclusion criteria:**
- All primigravidae between 13 to 20 weeks of pregnancy.
- Singleton pregnancy

Exclusion criteria:

- Patients with any other major comorbid illness.
- refusal to participate in the study.

OBSERVATIONS AND RESULTS

DIVISION OF GROUPS:

A total of 324 patients were included in the study, these patients were divided into two groups based on their serum CRP levels. A total of 63 (19.4%) patients had CRP levels <0.6mg/dl and belonged to grouped to group B, (table 5; figure 3)

Table 5: Division of groups

	No. of patients	(%)
Group A	63	(19.4)
Group B	261	(80.6)

Division of subgroups:

All the patients in group A with CRP levels of more than >0.6mg/dl were then divided into subgroups based on CRP liters. They were grouped into subgrouped AD, AD, AD with CRP levels of 0.6mg/dl, 1.3-2.4mg/dl, >2.5mg/dl respectively. (Table 2). The distribution of patients according to CRP liters were as follows:

C-reactive protein titers (mg/dl)	No. of patients (N-324)	(%)
06.-1.2 (subgroup A1)	32	9.8%
1.3-2.4 (subgroup A2)	20	6.1%
<2.5 (subgroup A3)	11	3.3%
<0.6 (subgroup B)	261	80.5%

CRP levels and incidence of preterm labor:

In group A, 77.9% of patients delivered preterm, before 37 completed weeks of gestational age, and 22.1% had term delivery (> 37 weeks). In group B, 19.8% had preterm delivery and 79.7% delivered at term, (table 3)

Gestational age at delivery	Group A		Group B	
	No. of patients	%	No. of patients	%
Preterm	49	77.8%	52	19.8%
Term	14	22.2%	209	79.7%

P<0.05, hence there is a statistical significance between the maternal serum CRP levels in early in trimester of pregnancy and incidence of preterm labour.

DISCUSSION

In this study, 324 primigravidae with singelton pregnancy between gestational age of 13 to 20 weeks were enrolled. After a detailed history taking and physical examination, maternal serum CRP levels were estimated. Incidence of preterm delivery, mode of delivery (spontaneous or medically indicated) and gestational age at delivery (early stem or late preterm) was noted in both the groups. To study the linear trend and 1o estimate if there is a dose response relationship between increasing CRP levels and gestational age at delivery, the group A patients were divided into subgroups AD, AD, AD, based on CRP liters, corresponding to CRP levels of (0.6-1.2), (1.3-2.4), (> 2.5), respectively. The incidence of neonatal morbidity was compared in both the groups (namely group A and group B) to ascertain if measured maternal serum CRP levels has any association with neonatal morbidity. It was found that increased levels of maternal plasma CRP in early pregnancy were associated with increased incidence of preterm delivery. Compared with women with normal CRP levels, those with elevated CRP levels >0.6mg/dl) had a greater than seven-fold higher odds of preterm delivery. These findings suggest that inflammation, as represented by elevated CRP levels, could lead to the physiologic changes that result in preterm delivery.

CRP levels and incidence of preterm delivery

In the present study it was found that elevation in maternal serum CRP concentrations in early 2" trimester of pregnancy is positively associated with preterm delivery. A 7-fold higher incidence of preterm delivery was noted in, group A patients as compared to group B, patients. In group A, 49. (77.8%) patients had preterm delivery, whereas in group B, 53 (19.9%) patients had preterm delivery ($p<0.05$). The multivariate odds ratio for preterm delivery for a CRP level of <0.6mg/di (vs.>0.6mg/di) was 7.72 95%CI 4.4- 13.4).

Correlation between CRP levels and gestational age at delivery:

The preterm delivery cases were categorized according to gestational age: delivery into early preterm delivery, i.e. those who delivered < 34 weeks of gestational. Age and late preterm delivery, defined as delivery- between 34 and <37 weeks gestational age. This division was based on the study done by Vitool Lohsoonthorn(12) et al. In this study an analysis was done with 2^000 eligible women and association between CRP levels in maternal serum in early 2nd trimester of pregnancy and early preterm and late preterm delivery was noted.

In group A, 36.5% of. patients delivered before 34 weeks of gestational age and 41.3% patients delivered between 34 - 36.6 weeks of gestational age. In group B, 8.4%, patients delivered at < 34 weeks GA, and 11.4% patients delivered between 34 -36.6 weeks GA. The mean concentration of serum CRPwas higher in women who delivered before 34 weeks gestational age (1.13mg/dl: interquartile range, 0.6 - 3.6) than those who delivered between 34 and less than 37 weeks(1.11 mg/dl: interquartile range, 0.6 3.2), but was not statistically significant.

CRP TITERS AND GESTATIONAL AGE ATDELIEVERY:

The patients in the study group were, 4. when divided into the subgroups based on CRP liters. The increasing levels of CRP titers did not show any association with gestational age at delivery. Hence there was no dose response relationship between CRP titers and early preterm or late preterm delivery.

CRP CONCENTRATIONS AND MODE OOFDELIVERY:

In the subgroup. analysis of preterm delivery, 8roup A with elevated levels of CRP >0.6mg/di) was associated with a 3 fold increased risk of spontaneous preterm delivery (OR 3.45, 95% Ci: 0.95-21.95).The association with medically indicated preterm delivery and maternal CRP levels was not statistically P o significant (OR 1.15, 95% Ci: 0.85-4.43).

Birth weight of early preterm, late preterm and term infants was similar in both the groups (group A and group B). The 1 min and 5 min APGAR score of neonates born at <34 weeks and between 34 to <37 weeks gestational age in both the groups (Group A and Group B) showed no significant difference.

SUMMARY

7 fold higher incidence of preterm delivery was noted in group A, patients with CRP levels>0.6mg/dl as compared to group B, patients whose concentration was<0.6mg/dl.

Group A patients showed statistically significant association with spontaneous preterm delivery, but not with that of medically indicated preterm delivery

No statistical significance was found between increasing CRP titers and gestational age at delivery very preterm delivery or moderately preterm delivery). The birth weight of infants of group A patients were lower as compared to those group B, which was statistically significant

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