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A STUDY TO ASSESS PREDICTIVE ROLE OF C-REACTIVE PROTEIN IN EARLY PREGNANCY AMONG WOMEN

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Abstract
Background: To Assess Predictive Role of C-Reactive Protein In Early Pregnancy among Women
Methods: Hospital based comparative analysis was conducted on Women with early pregnancy upto 14 weeks with either abdominal pain or vaginal bleeding or suspected extrauterine pregnancy. C-reactive protein (CRP) quantitative estimation is done by turbi-diametric method. Collected samples were sent to a designated lab of our hospital.
Results: The mean c-reactive protein level in cases 2.31 with min-max value ranging from 0.80-3.91mg/dl while in controls mean c-reactive protein value came to be 9.12 with min-max range from 3.21-24.16 mg/dl. The difference between the two groups is significant as p value is less than 0.001.
Conclusion: Our results of significantly increased CRP levels in normal pregnancy and a clear association between CRP and normal pregnancy, support the clinical application of this diagnostic tool in early pregnancy, especially as a predictor of abnormal first trimester pregnancies.
Keywords: CRP, Pregnancy, Women

Introduction

In first trimester, raised CRP levels have been reported and more recently it was shown that women with higher CRP levels at 9-13 weeks are more likely to develop gestational diabetes mellitus and pre-eclampsia.[1] It is not possible to assess the maternal fetal interface in ongoing or threatened pregnancies directly. Hence, the interest in circulating factors such as cytokines.[2]

One of the most important markers of an inflammatory response is C- reactive protein (CRP), first discovered in 1930 as an acute phase protein that reacted with the c-polysaccharide of pneumococcus bacteria. CRP does not cross the placental barrier and therefore, will be useful in diagnosing infections in newborns.[3]

Recently, it has been shown that CRP is present in amniotic fluid and fetal urine, and the elevated levels are associated with adverse pregnancy outcome. These results demonstrate that the human placenta produces and releases CRP, like other placental proteins, mainly into the maternal circulation.

Material and Method

Study Design

Prospective Study
The study included women with early pregnancy upto 14 weeks divided further as:

Case:

Women with early pregnancy upto 14 weeks with either abdominal pain or vaginal bleeding or suspected extrauterine pregnancy.

Control:

First trimester pregnancy upto 14 weeks

Inclusion Criteria

Patient who gave written and informed consent.

Women with known first trimester pregnancy (upto 14 weeks of pregnancy) who were referred to our department with or without abdominal pain, vaginal bleeding and suspected extrauterine pregnancies.

Exclusion Criteria

- Pregnant women who had already been treated with methotrexate for ectopic pregnancy
- Women with a known chronic or acute inflammatory condition (e.g. inflammatory bowel disease, or arthritis, lupus vasculitis, heart diseases, pneumonia, burns, trauma).
- Steroid/NSAID users or taking drugs like thiazolidinenone and statins.

Methodology

- All eligible patients fulfilling inclusion criteria were explained about nature and purpose of the study.

- After taking their informed and written consent, detail history, general and systemic examinations were done.
- Patients venous blood samples were collected for CRP in plain vial along with routine blood investigations and USG for foetal well being.
- C-reactive protein (CRP) quantitative estimation is done by turbi-diametric method. Collected samples were sent to a designated lab of our hospital.
- All information and reports were recorded on a predesigned proforma and were entered in Microsoft Excel sheet to prepare master chart.

Results

The mean age of study participants was 22.26±1.56 yrs which was found similar to that in control group(22.36±1.68). It was observed that 85% of cases and 85% of controls were from 5-10 weeks of gestation; and 15% cases and controls had 11-14wks of gestation. Therefore two groups were similar by period of gestation and p value was >0.05 (NS).

Table 1: Comparison of mean Serum C-Reactive Protein levelbetween Case and Control

CRP Level (mg/dl)	Case	Control
Mean ± SD	2.31±0.79	9.12±5.16
P value	P<0.001	

The mean c-reactive protein level in cases 2.31 with min-max value ranging from 0.80-3.91mg/dl while in controls mean c-reactive protein value came to be 9.12 with min-max range from 3.21-24.16 mg/dl. Hence mean c-reactive protein levels were higher among controls showing that a higher c-reactive protein level was seen among pregnant women in early gestation with normal intrauterine pregnancy when compared to abnormal presentations in first trimester of pregnancy.

Discussion

The mean c-reactive protein level in cases 2.31 with min-max value ranging from 0.80-3.91mg/dl while in controls mean c-reactive protein value came to be 9.12 with min-max range from 3.21-24.16 mg/dl in our study.

Hence mean c-reactive protein levels were higher among controls showing that a higher c-reactive protein level was seen among pregnant women in early gestation with normal intrauterine pregnancy when compared to abnormal ones. Our study results are in line with similar studies conducted by : Watts et al 1991[4] reported 7-9 mg/l CRP levels for pregnant women not in labour starting from 22 weeks of gestation compared to non-pregnant population. GP Sacks et al 2004[5] observed that pregnant women had significantly higher CRP levels (median 3.68 mg/l) than those who were not pregnant (median 1.495 mg/l, P < 0.0001), a difference that persisted after excluding potential confounding variables. Boggess KA, Lieff (2005)[6] study was to determine the relationship between maternal inflammation and first or second trimester pregnancy loss compared maternal serum C-reactive protein concentration between women with a pregnancy loss at < 21 weeks gestation to control women without gestational diabetes or preeclampsia who delivered at term. Median serum C-reactive protein concentration was significantly higher in controls compared with all cases (3.2 versus 0.5 microg/mL; p <0.001). Also studies conducted by Pitiphat et al (2005)[7] and Lohsoonthorn et al (2007)[8] found there is statistically significant association between CRP concentrations in early pregnancy >8mg/l and subsequent preterm delivery, with odds ratios of 2.55 and 2.04; respectively in two studies

Conclusion

Our results of significantly increased CRP levels in normal pregnancy and a clear association between CRP and normal pregnancy, support the clinical application of this diagnostic tool in early pregnancy, especially as a predictor of abnormal first trimester pregnancies.

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