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EVALUATION OF C-REACTIVE PROTEINS (CRP) IN THE DIAGNOSIS OF PREMATURE RUPTURE OF MEMBRANE IN PATIENTS ATTENDING IN TERTIARY CARE HOSPITAL AT MUZAFFARPUR, BIHAR

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Abstract

Objective: C-Reactive Proteins (CRP) is an important marker of Sub-clinical infection in cases of Premature Rupture of Membrane (PROM).The aim of present study was the evaluation of CRP from the patients attending in our hospital with premature rupture of membrane.

Materials and Method: A total of 32 patients of Preterm, Premature rupture of membranes and 32 patients preterm with intact membranes as a control, between 28-36 weeks of gestation were included in the study.

Results: The Sensitivity and specificity of CRP determination was found to be 78.12% each as an early predictor of subclinical chorioamnionitis. TLC had a low sensitivity of 22% and specificity of 65% in detecting histological chorioamnionitis (HCA).

Conclusion: CRP estimation is a simple, reliable, quite affordable and reasonably marker for the detection of early chorioamnionitis.

Keywords: PROM, CRP, Chorioamnionitis, Sensitivity, Specificity

Introduction

C- reactive protein is an acute phase protein, produced by hepatocytes and secreted in the blood after inflammation, infection, trauma, necrosis, malignancy, and allergic reactions. It is a indicator of inflammation.

CRP level can increase 10,000-fold from less than 50 µg/l to more than 500 mg/L after stimulus and production and concentration of CRP increase to 5 mg/L by 6 hours and peak at 48 hours, which increases with inflammation. It cans double every 8 hours and reaches its peak at 36 to 50 hours. CRP level between 100 and 500 mg/L is considered highly predictive of inflammation due to bacterial infection [10].CRP level decrease rapidly after infection has subside due short half life of CRP.

Acute inflammation of the membranes and chorion of placenta is known as Chorioamnionitis or Intra-amniotic infection and it is typically due to ascending polymicrobial bacterial infection due to premature rupture of membranes. Most common Microorganism causing chorioamnionitis is Genital Mycoplasma, Ureaplasma Urealyticum, and Mycoplasma hominis, Gardeneralla Vaginalis, Group-B Streptococcus, E.coli, Enterrococcus and Listeria monocytogenous are also responsible for that[11].

Premature rupture of membrane (PROM) is one of the most common underlying causes of preterm delivery, stillbirth and neonatal sepsis, chronic lung disease, Brain injury leading to cerebral palsy, other neurodevelopment disability and perinatal death [1,5,6].

It has been reported that histopathological changes of chorioamnionitis appear before the clinical evidence of chorioamnionitis has manifested. A significant association was found between elevated CRP and histological chorioamnionitis in preterm PROM [4]. CRP values were significantly higher in infected pregnancies.

The present study was designed to know the significance of C-reactive proteins in the prediction of chorioamnionitis.

Materials and Methods

The present study was conducted in the Department of Biochemistry, Sri Krishna Medical College, Muzaffarpur, Bihar, with the help of Department of Microbiology, Pathology, Obstetrics and Gynaecology Department, during the period between November 2017 to December 2018. A total of 32 patients were admitted in the maternity ward, with presenting complain of Premature rupture of membrane (PROM) between 28-36 weeks were included in the study. Patients having any acute or chronic infections

were excluded from the study. From all the patients and control group informed consent were taken.

Simultaneously 32 patients matched for age, parity, period of gestation with normal pregnancy and without any history of ruptured or leaking membranes were studied as control groups. Following admission routine investigations like CBC (By Sysmax five parts fully automated), blood sugar, viral marker, LFT, KFT, BT, CT, PT INR and ESR were done in each cases.

Estimation of C - reactive protein was done by Quantitative Immunoturbidimetric method (supplied by Roche Integra fully automated method), was done in the both study group and control groups. Estimation of C-reactive protein was done on admission, after 24 hrs, 48 hrs, 3rd day, 5th day and following delivery in the study group and at the time of admission and following delivery in the control group. Placenta and membranes were sent for histopathological examination to detect any evidence of chorioamnionitis in each case.

Results

Out of 32 patients in the study group, 25 (78.12%) patients were positive for CRP in their serum. Whereas in 24 (75%) patient's placenta and membranes had changes suggestive of chorioamnionitis, remaining 7 (21.88%) patients had histologically normal placenta and membranes (Table -1).

In the control group C-reactive protein and histopathological evidence were present in 2(6.25%) cases and negative in rest of 30 (93.25%) cases (Table -1).

In study group CRP was positive in 24 (75%) out of 32 cases with histopathological evidence of chorioamnionitis and in 01(3.125%) without chorioamnionitis (Table -1).

In control group CRP was positive in 2 (6.25%) cases with chorioamnionitis while in rest of 30(93.25%) patients without chorioamnionitis (Table -1).

CRP had a sensitivity and specificity of 78.12% each for the diagnosis of histological chorioamnionitis. The positive predictive value and negative predictive values of CRP came out to be 75% and 3.125% respectively.

Table 1: shows comparative study of C-reactive protein with histopathological findings of placenta

Total no. of patients included in the study	C-Reactive protein	No. of patients	Histopathology of placenta	
			With chorioamnionitis	Without chorioamnionitis
Study Group N=32	Positive	25 (78.12%)	24 (75%)	1 (3.125%)
	Negative	7 (21.88%)	5 (15.63%)	2 (6.25%)
Control Group N=32	Positive	2 (6.25%)	2 (6.25%)	0 (0%)
	Negative	30 (93.25%)	0 (0%)	30 (93.75%)

Table- 1 shows predictive values of CRP with histopathology of placenta in study and control groups.

Table 2: shows comparative study of histopathological findings with pulse, temperature, TLC and CRP levels in the study groups.

Chorio-amnionitis	Total no. of patients	Pulse > 100/min	Temp > 37^{0}C	TLC	CRP + ve	CRP – ve
+ve	24	7	6	5 >16000/mm^3	24	5
-ve	7	0	0	2	1	2

Table-2 shows that CRP positivity correlated better with histological chorioamnionitis than other parameters like pulse, temperature and TLC.

Discussion

In our study, CRP was proved to be most reliable early predictor of hisotlogical chorioamnionitis. CRP had a sensitivity and specificity of 78.12% each and positive predictive value of 75%. Results are in agreement with those of other workers but Ismail et al have reported low specificity value[3].

Raised TLC as a predictor of histological chorioamnionitis had a low sensitivity of 22% and specificity of 65%. In the study group, out of 24 patients with chorioamnionitis only 04 had raised TLC. Even in cases of this group with no chorioamnionitis, 02 had raised TLC. Results are in agreement with those of previous workers [2].

Maternal temperature, maternal pulse rate and foetal heart rate did not indicate infectious morbidity in the form of histological chorioamnionitis. The difference between study and control groups regarding these parameters were insignificant.

Conclusion

Therefore, it can be concluded that measurement of CRP levels to diagnose subclinical infection in the form of histological chorioamnionitis in cases of PROM has significant advantages. CRP determination is rapid, inexpensive and independent of pregnancy and gestational age. More important, CRP determination is non-invasive, repeatable and is obtainable in 100% of patients.

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