www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i6.158

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Article

Significance of C-Reactive Proteins (CRP) in the Prediction of Patients with Premature Rupture of Membranes

Authors
Dr Nayana Deb[1], Dr R.R. Sinha[2], Dr Satyendu Sagar[3]
[1]Tutor, Department of Biochemistry, Nalanda Medical College, Patna
[2]Professor & HOD, Department of Biochemistry, Nalanda Medical College, Patna
[3]Assistant Professor, Department of Microbiology, Nalanda Medical College, Patna
Corresponding Author
Dr Satyendu Sagar
Assistant Professor, Department of Microbiology, Nalanda Medical College, Patna, India

Abstract
Objective: *C-Reactive Proteins (CRP) is an indicator of Sub-clinical infection in cases of Premature Rupture Of Membrane (PROM). The aim of present study was the estimation of CRP from the patients with premature rupture of membrane.*
Materials and Methods: *A total of 28 cases of Preterm, Premature rupture of membranes and 28 patients preterm with intact membranes, between 28-36 weeks of gestation were studied.*
Results: *The Sensitivity and specificity of CRP determination was found to be 82.6% each as an early predictor of subclinical chorioamnionitis. TLC had a low sensitivity of 20% and specificity of 60% in detecting histological chorioamnionitis (HCA).*
Conclusion: *CRP estimation is a reliable marker for detection of early chorioamnionitis at the same time, it is quite affordable and reasonably simple.*
Keywords: *PROM, CRP, Chorioamnionitis, Sensitivity, Specificity*

Introduction

Premature rupture of membrane (PROM) is one of the most common underlying cause of preterm delivery, stillbirth, neonatal sepsis, chronic lung disease, Brain injury leading to cerebral palsy, other neurodevelopement disability and perinatal death. Chorioamnionitis or Intraamniotic infection is an acute inflammation of the membranes and chorion of placenta, typically due to assending polymicrobial bacterial infection due to premature rupture of membranes. Most common Micro-organism causing chorioamnionitis is Genital Mycoplasma, Ureaplasma Urealyticum, and Mycoplasma hominis. Gardeneralla Vaginalis, Group-B Streptococcus, E.colli, Enterococcus and Listeria monocytogenous are also responsible for that. 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. 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, Nalanda Medical College, Patna with the help of Department of Microbiology, Pathology, Obstetrics and Gynecology Department, during the period between January 2016 to January 2018. A total of 28 patient Admitted in the maternity ward, with PROM between 28-36 weeks were studied.

Patients having any acute or chronic infections were excluded from the study. Simultaneously 28 patients matched for age, parity, period of gestation with normal pregnancy and without any history of ruptured or leaking membranes were studied as controls group. Following admission routine investigations like CBC (By Sysmax five part fully automated), 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 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 28 patients in the study group, 20 were positive for CRP in their serum. Whereas in 23 patients placenta and membranes had changes suggestive of chorioamnionitis, remaining 5 patients had histologically normal placenta and membranes. In the control group C-reactive protein and histopathological evidence were present in 2 cases and negative in rest of 26 cases. Table 1, shows and predictive values of CRP with histopathology of placenta in study and control group. In study group CRP was positive in 19 out of 23 cases with histopathological evidence of chorioamnionitis and in one out of 5 cases without chorioamnionitis. In control group CRP was positive in 2 cases with chorioamnionitis while in rest of 26 patients without chorioamnionitis (Table -1). CRP had a sensitivity and specificity of 82.6% each for the diagnosis of histological chorioamnionitis. The positive predictive value and negative predictive values of CRP came out to be 94.1% and 50% respectively. Table-2 shows that CRP positivity correlated better with histological chorioamnionitis than other parameters like pulse, temperature and TLC.

Table 1 C-reactive protein with histopathological finding of placenta

	C-Reactive protein	No. of patients	Histopathology of placenta	
			With chorioamnionitis	Without chorioamnionitis
Study Group	Positive	20	19	1
	Negative	8	4	4
Control Group	Positive	2	2	0
	Negative	26	0	26

Table 2 Correlation of histopathological findings with pulse, temperature, TLC and CRP levels in the study group

Chorio-amnionitis	No. of cases	Pulse > 100/min	Temp > 37^{0}C	TLC	CRP +ve	CRP –ve
+ve	23	4	4	>15000/mm^3	19	4
-ve	5	0	0	2	1	4

Discussion

In our study, CRP was proved to be most reliable early predictor of hisotlogical chorioamnionitis. CRP had a sensitivity and specificity of 82.6% each and positive predictive value of 94.11%. Results are in agreement with those of other

workers but Ismail et al have reported low specificity value. Raised TLC as a predictor of histological chorioamnionitis had a low sensitivity of 20% and specificity of 60%. In the study group, out of 23 patients with chorioamnionitis only four had raised TLC. Even in cases of this group with no chorioamnionitis, two had raised TLC. Results are in agreement with those of previous workers. Maternal temperature, maternal pulse rate and fetal 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, independent of pregnancy and gestational age. More important, CRP determination is non-invasive, repeatable and is obtainable in 100% of patients.

References

1. Diakoku NH, Kaltreider DF, Khouzami UA, Spense M, Johnson JWC. Premature rupture of membranes and spontaneous pre term labour; maternal endometritis risks. Obstel Gynecol 1982; 59:13-9.
2. Hawrylyshyn P, Bernstein P, Milligan JE, Soldin S, Pollard A, Papsin FR. Premature rupture of membranes. The role of C-reactive protein in the prediction of chorioamnionitis. Am J Obstet Gynecol 1983; 143:240-6.
3. Ismail MA, Zinaman MJ, Lowensohn RI, Moawad AH. The significance of C-reactive protein levels in women with premature rupture of membranes. Am J Obstet Gynecol 1985; 151:541.
4. Fisk NM, Fysh J, Child AG, Gatenby PA, Jafferey H, Brapfield AH. Is C-reactive protein really useful in preterm premature rupture of membranes. Br J Obstet Gynecol 1987; 94:1159-64.
5. Potkul RK, Moawad AH, Ponto KL. The association of subclinical infection with preterm labour. The role of Cr-reactive protein. Obstet Gynecol 1985; 153:642-5.
6. Frab HF, Arnesen M, Geistler P, Knox GE. C-reactive protein with premature rupture of membranes and premature labour. Obstet Gynecol 1983; 62:49.
7. Salazer Hr, Genger H, Mohar U, Lischka A, Sachatten C, Pollak A. C-reactive protein: an early marker for neonatal bacterial infection due to prolonged rupture of amniotic membranes and/or amnionitis. Acta Obstet Gynecol Scand 1987; 66:365-7.
8. Romen Y, Artal R. C-reactive protein as a predictor of chorioamnionitis in cases of premature ruputre of membranes. Am J Obstet Gynecol 1984; 150:546-50.
9. Evans MI, Hajj SN, Devove LD. C-reactive protein as a predictor of infectious morbidity with premature rupture of membranes. Am J Obstet Gynecol 1980; 138:648-51.