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The Association between C- Reactive Protein and Preeclampsia in Late Pregnancy

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Abstract
Objective: *To study the association between C-Reactive Protein (CRP) level and preeclampsia in late pregnancy.*
Patients & Methods: *A total 100 pregnant women were enrolled in this study, all at third trimester. Their ages ranged between 29-49 years. About 60 had a hypertensive disorder while the other 40 were normotensive. Then the hypertensive group divided into two groups. The first group with mild preeclampsia and the second one with severe preeclampsia. Test was done for CRP-Latex Reagent.*
Results: *There were 42 are primigravida and 18 multigravida among the 50 pregnant women at third trimester. While 30 primigravida and 10 multigravida in the control group. 58% with mild preeclampsia and 77% with sever preeclampsia were positive for CRP, while just 22% of control group were positive for CRP.*
Conclusions: *CRP tend to be higher in pregnant women, who are at risk of developing preeclampsia than in healthy pregnant women, so it can be used as a predictive marker for early detection of preeclampsia.*
Keywords: *C-Reactive Protein, Pregnancy, Preeclampsia.*

Introduction

Preeclampsia (PE) is a hypertensive disorder unique to pregnancy characterized by maternal endothelial dysfunction and an excess inflammatory response. The syndrome is sharing the underlying pathophysiological processes with cardiovascular disease. The specific pathogenesis of preeclampsia remains incompletely elucidated, though contributing factors have been identified, including abnormal placentation, oxidative stress, altered antigenic factors and inflammation[(1)]

Preeclampsia rely is an idiopathic disorder of pregnancy characterized by proteinuric hypertension. Recent estimates indicate that over 6300 women die worldwide each year because of preeclampsia and its complications, with 98% of these occurring in developing countries. Preeclampsia is the second commonest cause of both direct maternal death and prenatal loss, responsible for the death of six to nine women annually and over 175 babies[(2)].

More than 10% of women will develop preeclampsia in their first pregnancy and although the overwhelming majority of these will have successful pregnancy outcomes. The condition can give rise to severe multisystem complications including cerebral hemorrhage, hepatic and renal dysfunction and respiratory compromise. The prevention and treatment of this disorder has been challenging due to an incomplete understanding of the underlying pathogenesis[(1)].

C-Reactive Protein (CRP) is a plasma protein associated with acute inflammatory responses. In the past decade, elevation in serum CRP have been associated with risk of cardiovascular disease, raising interest in the relationship of CRP with preeclampsia and contributory to its pathogenesis. It has been sought to evaluate a possible predictive role of CRP for recurrent preeclampsia in women with a history of the disease in a prior pregnancy. However most of the findings were based on a cross- sectional analyses of small convenience samples, due to the temporary ambiguity generated by this type of design and the lack of adequate statistical power /external validity. These studies do not clarify whether the elevated CRP concentration is a cause or a consequence of preeclampsia[(3)].

The aim of the study is to investigate the association between CRP level and preeclampsia in late pregnancy.

Patients & Methods

The present study was conducted in Basra Maternity and Child Hospital. The study was done on patients who attended the outpatient Department of Obstetrics and Gynecology and patients who were admitted to obstetrical ward. The informed consent was obtained from individual subjects.

The study composed of total number 100 women from whom 60 were hypertensive pregnant women and 40 normotensive pregnant women, all at 3rd trimester as a control group.

The first hypertensive groups were divided into mild preeclampsia and severe preeclampsia. All patients were examined at 28-40 weeks of gestation.

The exclusion criteria were gestational diabetes, infectious diseases, premature rupture of membrane, early labor, and heart diseases.

Preeclampsia was diagnosed when a blood pressure equal or more than 140/90mmHg, at least at two occasions more than six hours apart and a positive protein in urine by a dipstick one+ or higher than 300mg /24 hour were observed after the 28th week of pregnancy .

Severe preeclampsia was diagnosed with diastolic blood pressure at 110mmHg or more at two occasions six hours apart, with positive protein urea ++ or more than 200mg/24 hour with symptoms of sever hypertension like headache and blurred vision.

Venous blood samples (5ml) were collected from all women after overnight fasting, then estimation of CRP in human plasma was done using CRP-Latex Reagent (Lorne Laboratories Ltd, U.K). Student t- test was used to indicate the significance of difference between cases and controls for the various parameters.

Results

There were 42 primigravidas and 18 multigravida in the study group versus 30 primigravida and 10 multigravida in the control group (Table 1).

Maternal age was 28.3_+6 years ranging between 20-40 years in the study group in comparing with a control group which was 25.9_+ 5 ranging between 20-40 years. There is a significant difference between the study and control in regent group age between 30-39 years (Table 1).

Table 1: Age distribution of all studied groups

Age	pre-eclampsia group(60)	Control group(40)	P – value
≤ 20	2	7	Ns
21-29	26	23	Ns
≤ 30-39	27	8	0.05
≥ 40	5	2	Ns
Parity primgravida	42	30	Ns
Multiparea	18	10	Ns

Gestational age of the control group was 34±4 ranging between 30-38 weeks, while the gestational age of the patients with mild preeclampsia was 39±7.6 weeks ranging between 30-38 weeks and the patients with severe preeclampsia their mean age was 34+4 weeks ranging between 28-40 weeks (Table 2).

Table 2: Gestational age of all studied groups.

Groups	Control	Mild preeclampsia	Severe Preeclampsia	P- -value
Gestational age	34±4	34.76	32.7±3	NS

58% of pregnant women with mild preeclampsia and 77% of women with sever preeclampsia were positive CRP in comparing to 22% of pregnant women in control group with positive CRP which is statistically significant. 41% of mild preeclampsia women and 19% of severe preeclampsia which were negative CRP in comparing to 77% of control group (Table 3).

Table 3: The detection of CRP in all studied groups

	Mild preeclampsia N= 29	Severe preeclampsia N= 31	Control N=40	P-value
Serum CRP +ve CRP –ve	 17(58%) 12(41%)	 24(77%) 6(19%)	 9(22%) 31(77%)	 0.05 0.05

Discussion

Over recent years, there has been an increasing interest for the detection of pregnancy disorders before the symptoms occur. Endothelial dysfunction is accompanied by elevated levels of inflammatory markers, which is higher in women with preeclampsia in comparison with normal pregnancy, one of these marker is CRP which is enrolled in response to stress, tissue injury and other inflammatory stimuli[4].

Since maternal health and pregnancy outcome is dramatically affected by hypertensive disorders of pregnancy. So early detection and interventions to minimize the harm. Endothelial dysfunction leads to elevated serum CRP in inflammation. Since early identification of patients with increased risk of preeclampsia is one of the important goals in obstetrics, it has been attempted to elaborate on the correlation between such inflammatory markers and presence of preeclampsia[5].

In the present study, the relationship between the high levels of CRP and preeclampsia had been reported, which is in agreement with other workers[5,6]. It has been suggested that the cause of elevated serum CRP in preeclamptic patients might be a result of reduced plasma volume in these patients[5].

In contrast some other studies have demonstrated no significant difference between hypertensive disorder and preeclampsia[7. 8].

Nevertheless, no significant changes were observed when compared to the normotensive group, but there were slightly elevated in the chronic hypertension[9].

Across sectional study done in London presents a different picture in that the serum CRP concentration in women who subsequently developed preeclampsia was not significantly different from that in women with uncomplicated pregnancies with regard to lipid parameters[10]. These finding was in agreement with finding have been also reported by Hirschfield[11].

Certain studies found a great and significance association between preeclampsia and chronic periodontitis and the association with high CRP levels[12-15].

In normal pregnancy, which is characterized by a mild pro-inflammatory state, where as preeclampsia is characterized by a severe state of inflammation[16].

CRP is an acute phase reactant produced by the liver in response to placental pro inflammatory cytokines especially 1L-6 on TNF alpha. Serum levels of CRP are higher in healthy pregnant women as compared to non-pregnant women because even normal pregnancy is accompanied by mild systemic inflammatory responses[17].

Therefore, CRP can be used as a predictive marker for preeclampsia during the first and second trimester of pregnancy

References

1. Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. Am J Obstetric & Gynecol 2000;183:S1-S22.
2. Menzies J, Magee LA, Li J et al. Instituting surveillance guidelines and adverse outcomes in preeclampsia. Obstetric & Gynecol 2007; 105: 121-127.
3. A prospective study of maternal serum C-reactive protein(Am J Hypertension. 2004).
4. Picklesimer A, Jard H, Moss K. Racia differences in CRP levels during normal pregnancy . Am J Obstetric Gynecology. 2008;199(5) : 523-526.
5. Picklesimer A, Jared H, Moss K, Offenbacher S, Beck J, Boggess K. Racial differences in CRP levels during normal pregnancy. Am J Obstet Gynecol. 2008; 1999(5):523,e1-523-e6.
6. Ustu n Y, Engin Ustu, Kamac M. Association of fibrinogen and CRP with severity of preeclampsia. Eur J Obstet Gynecol Reprod Biol. 2005; 121(2) 145-150.
7. Nakatsukasa H, Masuyaman H, Takamoto N, Hiramatsu Y. Circulating leptin and angiogenic factors in preeclampsia patients. Encodcrrine J. 2008: 55(3):565-573.
8. Mumtaz F, Memon AR, Yousfani S, Tahir SM, Khushk I, Memon M. et al. Role of serum leptin level as a marker of severity of preeclampsia. J Ayub Med Coll Abbottabad. 2008; 20(1): 13-15.
9. Z Tavana, J Zolghadri, G Madadi, The Relationship between maternal serum highly sensitive CRP and Hypertension disorder of pregnancy. The internal Journal of endocrinology 2010; 6 (2):
10. Savvidou MD et al, Levels of CRP in pregnant women who subsequently develop preeclampsia. BJOG. 2002;109 (3): 297-301.
11. Hirschfield GM, Pepsy MB; CRP and Cardiovascular disease; new insight from an old molecule. Q.J.Med, 2003; 96: 793-807.
12. Boggess KA, Lieff S, Murtha AP, Moss K, Beck J, Offenbacher S. Maternal periodontal disease is associated with an increased risk for preeclampsia. Obstet Gynecol 2003; 101: 227-231.
13. Canakci V, Canakci CF, Canakci H, Canakci E, Cicek Y, Ingec M, et al. Periodonal disease as a risk factor for preeclampsia : a case control study. Aust NZ J Obstet Gynaecol 2004; 44: 568-573.
14. Oettinger-Barak O, Barak S, Ohel G, Oettinger M, Kreutzer H, Peled M, et al. Sever pregnancy complication (preeclampsia) is associated with greater periodontal destruction. J Periodontal 2005; 76: 134-137.
15. Contreras A, Herrera JA, Soto JE, Arce RM, Jaramillo A, Botero JE Periodontitis is associated with preeclampsia in pregnant women. J Periodontol 2006; 77: 182-188.
16. Redman CW, Sacks GP, Sargent IL. Preeclampsia: an excessive maternal infiammatory response to pregnancy. Am J Obstet Gynecol 1999; 180: 499-506.