

## DETERMINATION OF C-REACTIVE PROTEIN (CRP) LEVEL IN PRE-ECLAMPTIC WOMEN (PEW)

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### Introduction

Pre-eclampsia (PE) is a disorder in which inflammation and anti-angiogenesis has been increased<sup>1</sup>. Placenta is the origin of this disorder and a cascade of critical responses has been released. In the anti-angiogenic responses soluble variants of the tumor growth factor- $\beta$  co-activating receptor endoglin and vascular endothelial growth factor receptor 1 are involved<sup>2,3</sup>. But in the inflammatory response multiple cytokines are involved. C-reactive protein (CRP) has been detected in amniotic fluid but normally it is produced in the liver<sup>4</sup>. CRP binds to the phosphocholine (PC) which is present on the surface of the cell<sup>5</sup>. The role of CRP in PE has been conceived for a long time. Many researchers have been recommended that PE has been related to the level of CRP in the pregnant women<sup>3,6,7</sup>. Some researchers on the basis of the meta-analysis studies suggested that there is a positive correlation between the level of CRP and the occurrence of pre-eclampsia<sup>8,9,10</sup>. The concentration of C-reactive protein is enhanced in the body before the onset of the disease<sup>8,10,11</sup>. However, in the PE, the functional role of CRP has not been clear. Many researchers have been exploring arterial hypertension as well as kidney and placental injury in pre-eclamptic disease<sup>7,9,12</sup>. Many scientists have been investigated that placenta is the site of production of CRP in addition to the liver in non pregnant women.<sup>2,5,10,13</sup> In a conventional setup, they inculcate the level of CRP in the circulation was observed to be comparable to those present in the circulation of PEW. It led to cause glomerular damage, hypertension, proteinuria and premature atherosclerosis within the placentas. Phosphocholine transferase activity has also been located in the placenta moreover its posttranslational modification has been done in placenta<sup>14</sup>. It has been observed that neurokinin receptor take part in hypertension in pregnancy and neurokinin B are attached with phosphocholine transferase are predominantly binds to receptors, this pathway was explored. Yet away from pregnancy, the level of C-reactive proteins is elevated in acute infectious defense responses<sup>4,5,11,15</sup>. In this study we determine the CRP level in preeclamptic women.

### Methodology

This study was done at Biochemistry department with the collaboration of Gynae & Obstetrics Department LUMHS Jamshoro during Jan2017-Jun 2017. Pregnant women in the 2<sup>nd</sup> and 3<sup>rd</sup> trimester with diagnosed PE and age between 20-45 years irrespective of parity were included in this study. The Patients were excluded with essential hypertension, Ischemic heart disease, chronic renal disease, rheumatoid arthritis and tuberculosis. The sample size was calculated (n=80) by 5% prevalence of pre-eclampsia in Pakistan, 95% confidential interval and 5% margin of error. Blood sample (05ml) was taken from participants according to inclusion and exclusion criteria. Sample was transferred aseptically in test tube and then centrifuged it.

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The supernatant was separated and stored in refrigerator at  $-20^{\circ}\text{C}$ . This cross sectional study was approved by ethical review committee LUMHS Jamshoro. Written informed consent was taken from all subjects. Data was collected on the proforma and results were analyzed by using SPSS version 16.

### Result

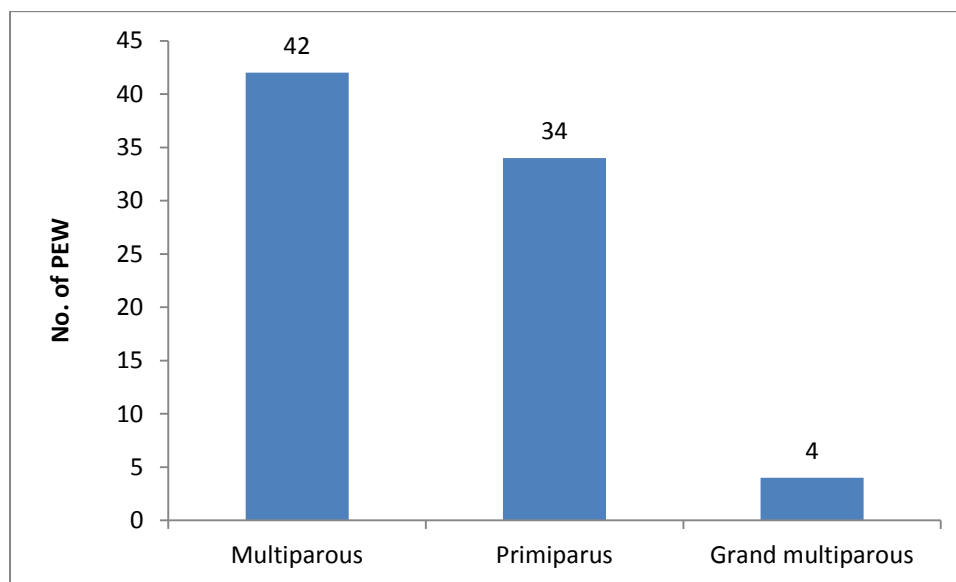
In this study pre-eclamptic women (PEW) were observed in the range of 19-35 years with mean age  $27.9 \pm 04.3$  years. The mean gestational age was  $32.8 \pm 03.4$  weeks with range of 22 weeks to 38 weeks in PEW (table 1). Pre-eclamptic women 52.5% (n=42) were primiparous, 42.5% (n=34) were multiparous and only 5% (n=4) women were grand multiparous (Fig 1). The systolic and diastolic blood pressure was observed increased. The mean systolic and diastolic blood pressure was studied  $148.0 \pm 10.8$  mmHg and  $100.6 \pm 5.3$  mmHg respectively (table 2).

It was also observed in this study that the mean of CRP was  $2.80 \pm 1.3$  mg/dl in PEW (table 3).

**TABLE.1. PEW Distribution according to age and gestational age**

PEW (n=80)	Age (Years)	Gestational age (weeks)
Mean $\pm$ SD	$27.9 \pm 04.3$	$32.8 \pm 03.4$
Minimum	19	22
Maximum	35	38

**Fig.1 PEW Distribution According to Parity n=80**



**TABLE.2. Cases Distribution According to Blood Pressure**

n=80

Group-B	Blood pressure ( mmHg)
Systolic BP	148.0±10.8
Diastolic BP	100.6±05.3

**TABLE.3.PEW distribution according to CRP**

n=80

PEW	C – reactive protein (mg/dl )
Mean	02.80±1.3
Minimum	0.8
Maximum	5.36

### Discussion

#### Pre-eclampsia

(PE) is a disorder of pregnancy correlated with endothelial cell impairment. There is elevating body of fact that PE is the systemic inflammatory disease<sup>9</sup>. Many researchers work on it and exhibited that indicators of endothelial inflammation or activation contribute actively in PE<sup>12</sup>. CRP is a sensitive indicator of tissue impairment and inflammation. CRP contributes in provoking the inflammatory responsive characteristics associated with PE. This study was done to determine the serum CRP level in PEW. In this study it was observed that the mean age of PEW was 27.9±04.3 years. Huang et al also observed that the mean age of PEW was 25.1 ±5.6 years; these findings are closest to our results<sup>12</sup>. Another researcher also found the comparable results regarding mean age of PEW was 24.58±4.05 years<sup>13</sup>.

In current study we found the mean gestational age was 32.8±03.4 weeks in subjects. Meena MI et al observed the same findings regarding the mean of gestational age 39.02±1.61 weeks in PEW<sup>1</sup>. While another study done by researchers found that the mean gestational age of the subjects was 18.6 ±4.5 weeks<sup>8</sup>. These findings showed the results in contrast to our findings. The gestational age of these findings were lower as compare our results; this is might be because in our study some subjects were on term pregnancy.

In our study the mean systolic and diastolic BP was observed significantly high in PEW 148.0+10.8 mmHg and 100.6±5.3 mmHg respectively. Other researchers also work on this and observed that the mean systolic and diastolic BP was 148.40 ± 12.35 mm Hg and 100.00 ± 9.74 mmHg respectively<sup>17</sup>. These findings are also closest to our results that systolic and diastolic BP was significantly elevated in PEW.

In this study CRP was found significantly elevated (2.80±1.3 mg/dl) in PEW as contrasted to normal subjects. Other workers also found the same findings; Al-Saeed HH et al also concluded that the level of CRP were significantly high in severe & mild pre-eclampsia onsets<sup>16</sup>. Some workers also found the same results the CRP level is significantly elevated in severe pre-eclampsia as compared to those patients with mild pre-eclampsia<sup>5,11,17</sup>. All these findings are supporting to our results that CRP level is high in PEW as compare to normal.

The higher CRP concentration in patients with PE delivering earlier in pregnancy could probably be a marker of disease severity and a marker of an excessive inflammatory response in patients with the most severe PE disease delivering prematurely compared with patients with less severe disease who deliver later in pregnancy.

## Conclusion

Our results showed that the level of CRP is elevated in PEW. So, CRP is a good marker for determination of pre-eclampsia.

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