



## Level of Serum Uric Acid in Pre-eclamptic and Normal Pregnant Women

Huda Abbas<sup>1</sup>, Samina Badar<sup>2</sup>, Zunaira Javed<sup>3</sup> and Mohamed Ahmed Abdelmoneam Ramadan<sup>4</sup>

1. Department of Community Medicine, Quaid-e-Azam Medical College, Bahawalpur, Pakistan  
 2. Department of Community Medicine, Multan Medical and Dental College, Multan, Pakistan  
 3. Bahawal Victoria Hospital, Bahawalpur, Pakistan  
 4. Women's Wellness and Research Centre, Doha, Qatar

\*Correspondence: hudaarshad@yahoo.com

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### Significance:

Preeclampsia has been defined as triad of hypertension, edema and proteinuria in pregnant women. The only useful sign for diagnosis of preeclampsia is a change in blood pressure because edema is consistent part of normal pregnancy. But many subjective and objective variations in blood pressure measurement can make early diagnostic sign of preeclampsia unsatisfactory. Rising serum uric acid level has been recognized recently as an early feature of preeclampsia.

### ABSTRACT

**Objective:** The objective of study was to find out serum uric acid level in normal and preeclamptic pregnant women of third trimester visiting outpatient department of obstetrics and gynecology of Bahawal Victoria Hospital, Bahawalpur.

**Methodology:** It was a cross sectional descriptive study conducted from July 2018 to June 2019. All primigravida women of age 18-35 years in third trimester of singleton pregnancy attending in Obstetrics and Gynecology Outpatient Department of Bahawal Victoria Hospital in study duration were included in the study. Statistical analysis was performed by using SPSS version 14. Chi-square test was performed to find the statistical difference regarding uric acid distribution between groups and 'p' value <0.05 was considered as a lowest level of significance.

**Results:** Out of total 1212 women 84.6% were normal and 15.4% had preeclampsia. In our study out of 187 preeclamptic women, 63.6% had raised serum uric acid level and out of 268 normal pregnant women uric acid level was raised in only 39.5%. Results were found statistically significant.

**Conclusion:** Results of our study suggest that serum uric acid level in pregnant women can be used as a useful and inexpensive marker in prediction of preeclampsia and preventive measures can be taken accordingly.

### Introduction

Pregnancy is commonly viewed as cooperative interaction between mother and fetus. Since, a combination of maternal and paternal genes forms

fetal genotype, a genetic conflict induced by paternally derived factors may exist between mother and fetus during placentation and expression of genes in the fetus dictated by the embryo's development needs. Continuous struggle and exchange of signals take place between them to maintain equilibrium. Any aberration in this equilibrium could result in events like pre-eclampsia (PE). (1) Preeclampsia is a multisystem disorder characterized by gestational hypertension after the 20th week of gestation and is one of the most potential complications contributing to preterm labor, premature delivery, perinatal mortality, maternal mortality, intra-uterine growth retardation and low birth weight infants. Hyperuricemia is one of the earliest and consistent observations in preeclamptic pregnancies. (2, 3) These disorders are most seen in primiparas and reported in 10% of pregnancies. (4, 5)

Traditionally preeclampsia has been defined as triad of hypertension, edema and proteinuria. It has been recognized that edema is consistent part of normal pregnancy, so it has little or no value as diagnostic sign of preeclampsia. The only useful sign for diagnosis of preeclampsia is a change in blood pressure but because of many subjective and objective variations in the measurement of blood pressure, this only early diagnostic sign of preeclampsia is unsatisfactory. Now a rising serum uric acid level has been recognized as an early feature of preeclampsia and its measurement greatly increases the accuracy of diagnosis. (6, 7)

This study was aimed to find out the difference in level of serum uric acid in preeclamptic and healthy pregnant women in third trimester of pregnancy attending obstetrics and gynecology outpatient department of Bahawal Victoria Hospital, Bahawalpur.

### Objective:

The objective of our study was to find out serum uric acid level in normal and preeclamptic pregnant women of third trimester visiting outpatient department of obstetrics and gynecology of Bahawal Victoria Hospital, Bahawalpur.

### Methodology

**Study design:** It was a cross sectional descriptive study.

**Study duration and setting:** Form July 2018 to June 2019 in outpatient department of obstetrics and gynecology of Bahawal Victoria Hospital, Bahawalpur.

**Study population:** All primigravida women of age 18-35 years in third trimester of singleton pregnancy attending Obstetrics and Gynecology outpatient department of Bahawal Victoria Hospital during study duration were included in the study.

**Exclusion criteria:** The women with history of chronic hypertension, diabetes mellitus, drugs intake, smoking, alcoholism, liver, cardiac or renal diseases or any other major illness were excluded from the study.

**Tools of data collection:** After obtaining ethical approval from hospital ethical committee and informed written consent from all the study subjects, relevant data were documented in a predefined data sheet and maintaining all aseptic precaution blood samples were collected from all the study subjects for estimation of serum uric acid concentration. Serum uric acid level was estimated by colorimetric assay.

**Operational definitions:**

**Preeclampsia:** Preeclampsia was defined as blood pressure (BP) of 140/90 mmHg or above in third trimester of gestation measured at least two occasions 6 hours or more apart accompanied by proteinuria of 300 mg per 24 hours or above in previously normotensive women.

**Uric acid level:** Uric acid level more than 4.5mg/dl was taken high.

**Data analysis:** Statistical analysis was performed by using computer-based software, Statistical Package for Social Science (SPSS) for windows version 14. Chi-square test was performed to find the statistical difference regarding uric acid distribution between groups and ‘p’ value <0.05 was considered as a lowest level of significance.

**Results**

Total 1212 subjects were included in the study fulfilling the inclusion criteria. The mean age of the study participants was 21.5±3.43 years and mean gestational age of 29.35±3.08 weeks. Out of total 1212 women, 84.6% were normal and 15.4% had preeclampsia as shown in table 1.

**Table 1: Frequency of Preeclampsia**

Preeclampsia	Frequency	Percentage
Present	187	15.4%
Not present	1025	84.6%

In our study out of 187 preeclamptic women, 63.6% had raised serum uric acid level and out of 268 normal pregnant women, uric acid level was raised in only 39.5% (Table 2).

**Table 2: Serum uric acid level in Preeclamptic and normal pregnant women**

Uric acid level	Preeclamptic		Non preeclamptic		Total
	Frequency	Percentage	Frequency	Percentage	
Raised	119	63.6%	405	39.5%	524
Normal	68	36.4%	620	60.5%	688
Total	187	100%	1025	100%	1212

$\chi^2 = 8.947, df = 1 P = 0.0028$

**Discussion**

The mean age of the study participants was 21.5 with standard deviation of 3.43 years and mean gestational age of 29.35 with standard deviation of 3.08 weeks. Our study results showed that frequency of preeclampsia was 15.4% which is consistent with the study conducted by Aram and Khalalian which it was found to be 16.1%. (8) The frequency of preeclampsia seen in our study was more than the study conducted by Alavi et al. in which preeclampsia was reported in 10% of the primigravids. (4) These results are also higher than the study conducted by Ghazavi et al. in Iranian population in which prevalence of preeclampsia in primigravids was found to be 7-10%. (9) Frequency of preeclampsia may be more in our study due to the reason that it was hospital-based, and participants were seeking medical care.

In our study, serum uric acid level was found to be significantly high in preeclamptic women than healthy pregnant women of third trimester (p<0.05). These results are comparable with the study conducted by Eslami et al. in which uric acid level was significantly high in preeclamptic women. (10) Our study results also matched with the study conducted by Sultana et al. in which uric acid level was significantly higher in preeclamptic women than that of controls. (11) Similarly, in the study conducted by Ghazavi et al., serum uric acid level was significantly higher in preeclamptic women than in controls. (9) The results of our study are also consistent with the study conducted by Devi in which direct relationship of serum uric acid and preeclampsia was found. (12)

**Conclusion**

Results of our study suggest that serum uric acid level in pregnant women can be used as a useful and inexpensive marker in prediction of preeclampsia and preventive measures can be taken accordingly.

**Conflict of Interest:** This study has no conflict of interest to declare by any author.

**Disclosure:** None

**Human and Animal Rights:** No rights violated

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