



## ESTIMATION OF SERUM URIC ACID LEVEL IN PREECLAMPTIC PREGNANT SUDANESE WOMEN

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### ABSTRACT

#### Background

An elevated level of uric acid during pregnancy has been considered a predictable tool for preeclampsia during the third pregnancy trimester. We investigated uric acid levels in preeclampsia women during their third trimester to validate the hypothesis and these outcomes stratified by presence of hyperuricaemia at delivery at all preeclampsia patients and the normal levels of the healthy ones.

#### Methods

During the period from April 2013 to September 2013, 200 blood samples were collected from pregnant ladies attending Jubal Awlia and Omdurman Maternity Hospital-Khartoum-Sudan, 100 of them were with symptoms of preeclampsia and 100 were normal pregnant included as control.

Uric acid was measured in maternal serum using uric acid enzymatic kit. All data was analyzed by computerized statistic program SPSS.

#### Results

The mean value of systolic and diastolic blood pressures in pregnant ladies with preeclampsia is higher ( $M \pm SD = 149.4 \pm 24.3$  for systolic, and  $108.8 \pm 11.5$  for diastolic), compared to normal pregnant ladies ( $M \pm SD = 125.4 \pm 12.5$  for systolic, and  $86.1 \pm 5.4$  for diastolic), ( $P = 0.000$ ). Serum uric acid was higher in preeclampsia pregnant ladies compared to normal pregnant ladies ( $M \pm SD = 8.5 \pm 3.5$ , and  $4.0 \pm 0.9$  respectively,  $P = 0.000$ ).

### Conclusion

On the basis of our data, the clinical utility of measuring serum uric acid levels in diagnosing preeclampsia may be of significant value.

**Key words:** Preeclampsia, Uric Acid, Pregnant women.

### INTRODUCTION

Preeclampsia is an obstetric disease that involves different systems and organs and is of unknown certain etiology (1). Preeclampsia affects almost 2-8% of all pregnancies and several complications have been reported with this disease (2). Preeclampsia is known to have a preclinical phase before signs and symptoms become overt in the second half of pregnancy (3). Unavailability of a precise test for identification of pregnant women at risk of developing preeclampsia is a major reason for the high morbidity of this disease (4). In 1917 the association between elevated serum uric acid and preeclampsia was reported for the first time (5). From that time on, uric acid measurement was considered a component in the work up of pregnant women with preeclampsia to monitor the severity of the disease and helped to manage it. There are several proposed mechanisms for elevation of uric acid in preeclampsia such as abnormal renal clearance, increased tissue breakdown, acidosis and a rise in the activity of the xanthine oxidase/dehydrogenase enzyme (6).

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Reduction in the clearance of uric acid due to the

reduction in the glomerular filtration rate, increased absorption and a decrease in the secretion may be the cause for the rise in the level of serum uric acid in preeclamptic women (2). Different sensitivity and specificity of the serum uric acid values have been posed in diagnosing and predicting preeclampsia and its complications, ranging from being the most sensitive indicator of preeclampsia\available (7) and having equal importance to proteinuria in identifying fetal risk in women with preeclampsia (8), to being of little or poor value in diagnosing and predicting preeclampsia (4, 9). This study aimed to compare the values of serum uric acid in preeclamptic and normal pregnant women and its correlation with some important maternal and fetal outcomes.

when compared to the ages of the control group (N=100, M±SD = 28.6±4.7years, P = 0.59). Mean value of systolic blood pressure in pregnant ladies with preeclampsia is (M±SD149.4±24.3).which statistically higher when compared with normal pregnant ladies (M±SD125.4±12.5) . There is asignificantly different in systolic blood pressure (P=0.000). Mean value of dystolic blood pressure in pregnant ladies with preeclampsia is (M±SD108.8±11.5).which statistically higher when compared with normal pregnant ladies (M±SD86.1±5.4) . There is a significantly different in dystolic blood pressure (P=0.000).

Mean value of uric acid level in pregnant ladies with preeclampsia is (M±SD 8.5±3.5).which statistically higher when compared with uric acid

**Table (1): Description of study population:**

Variable	Pre n(100) (M±SD)	Normal No(100) (M±SD)	P.value
Age	29.5±5.2	28.6±4.7	P = 0.59
Cystolic Blood Pressure	149.4 ±24.3	125.4±12.5	P = 0.000
Diastolic Blood Pressure	108.8 ±11.5	86.1±5.4	P = 0.000
Uric Acid in mg/dl	8.5±3.5	4.0±0.9	P = 0.000

## MATERIAL AND METHODS

Between April 2013 and September 2013, after obtaining their consent, in a case control study we screened tow grouped 100 each third trimester pregnant ladies submitted to Jabal Awlia and Omdurman Maternity Hospital for serum uric acid levels. Inclusion criteria of the study group were age >18 years, singleton pregnancy beyond the 20th week, blood pressure (BP) >140 mm Hg systolic or >90 mm Hg diastolic, and being diagnosed with preeclampsia. known heart disease, nephropathy, or hypertension preceding pregnancy and gout were reasons for exclusion from the study. control group was healthy pregnant ladies match the study group in age and pregnancy trimester.

Serum samples were collected from both groups and were tested for uric acid levels using uricase peroxidase method (biosystem kit).

Data analyzed computerize through program of SPSS.

## RESULTS

The ages of the pregnant ladies (N=100, M±SD = 29.5±5.2years) were not significantly different

level in normal pregnant ladies (M±SD4.0±0.9) . There is a significantly different in uric acid level in two groups (P=0.000). Shown in table (1)

## DISCUSSION

Uric acid test have been proposed as an indicator of the development of preeclampsia, this test that has been investigated, the data in this study suggest a statistically significant difference between the mean of serum uric acid values of pregnant ladies with preeclampsia symptoms, and control groups ( P = 0.000).

Although the data in this study suggest a statistically significant difference between the mean serum uric acid values of the case and control groups, the clinically importance of it is questionable. We were unable to identify an obvious cut off point for uric acid level that was sufficiently sensitive and specific to distinguish preeclampsia.

The findings of the study are consistent with those studies that did not find a clinical utility for serum uric acid in prediction of preeclampsia (11;12), and in contrary to some other studies (13). This might be because most of the studies have reported a strong correlation between elevated

serum uric acid and the severity of preeclampsia, have examined pregnant women with the most severe form of the disease (14).

Increasing evidence suggests that an elevated serum uric acid in pregnancy may not only be a valuable biomarker for preeclampsia but may also have a contributory role in the pathogenesis of the maternal and fetal manifestations (15).

## CONCLUSION

Measurement of serum uric acid concentration may be useful test to predict eclampsia and should be studied for the management of women with preeclampsia.

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