



Estimation of serum uric acid in Pregnancy induced hypertension

Authors

Dr Kanchan Kumari¹, Dr Usha Kumari²

^{1,2}Assistant Professor, Department of Biochemistry, Vardhmaan Institute of Medical Sciences, Pawapuri

Introduction

Pregnancy induced Hypertension is defined as blood pressure more than or equal to 140/90mmHg with or without proteinuria (>300mg/24hrs) appearing after 20th week of gestation, but resolving after 12th week of parturation. Pregnancy induced hypertension is also defined as new onset proteinuria (more than or equal to 300mg/24hrs)in hypertensive women who exhibit no proteinuria before 20th week of gestation.

Gestational hypertension is diagnosed as whose blood pressure more than or equal to 140/90mmHg first-time during pregnancy (20th week of gestation).

Preeclampsia is hypertension more than or equal to 140/90mmHg accompanied by proteinuria more than 300mg /24hrs first time after 20th week of gestation and both resolving after with 12th week postpartum.

Eclampsia is defined as onset of convulsions in women with pregnancy induced hypertension.

Uric acid is end product of Purine metabolism by xanthine oxidase and other enzyme and is responsible for uric acid production coupled with production of free radicals superoxide (O_2^-), which contribute to oxidative stress on endothelial

lining of arteries .These may contribute to development of gestational hypertension.

Aim and Objectives

Aim of our studies is to estimate serum uric acid levels in cases of gestational hypertension has been established previously, so that oxidative stress induced endothelial damage leading to plaque formation resulting in pregnancy induced hypertension could be prevented. In several studies an increase in serum uric acid levels has been observed in cases of gestational hypertension. This condition is very difficult for patient as well as doctors, because morbidity and mortality both are increased in cases of gestational hypertension, particularly with increased serum uric acid. We started estimation of uric acid levels in first trimester (less than 12 week of gestation),so that prevention of gestational hypertension and effect of uric acid on its generation could be possible.

By early institution of treatment of pregnancy induced hypertension we can prevent morbidity and mortality of patient.

Material and Methods

The present study was carried out in Biochemistry department Vardhmaan institute of medical

sciences, Pawapuri and Sadar hospital Biharsharif attached to Vardhmaan institute of medical sciences, Pawapuri. Total 110 cases were selected of which 15 cases were clinically normal non-pregnant women of reproductive age group (15-45years) and 45 cases were normal pregnant women of different age group. 60 cases were grouped as control. 50 cases of toxemia of pregnancy were taken for study, further cases categorized as 25 cases of preeclampsia and 25 cases of eclampsia. They were non smokers, not taking tobacco and free from other metabolic disorders. We had collected necessary information about cases and control.

Quantitative estimation of uric acid was carried by uricase method, which has many advantages. It is very easy method and uric acid can be determined within minutes and very small amount of serum

required. It is very sensitive and highly specific method.

Serum total protein, serum albumin, globulin, A/G ratio determined and blood pressure was measured.

Observation

The present study of observation of serum uric acid was carried out on total of 110 cases of which 15 cases were clinically normal non-pregnant women of reproductive age group (15-45years) and 45 cases were normal pregnant women in different trimester of pregnancy. 60 cases were grouped as control. 50 cases of toxemia of pregnancy were taken for study, further categorized as 25 cases of preeclampsia and 25 cases of eclampsia.

Table-1 Distribution of cases

Type of cases	NO. Of cases	Total
Non-pregnant(control)	15	15
Normal-pregnancy (control)		45
First trimester	15	
Second trimester	14	
Third trimester	16	
Toxaemia of pregnancy		50
Pre-eclampsia	25	
Eclampsia	25	
Total		110

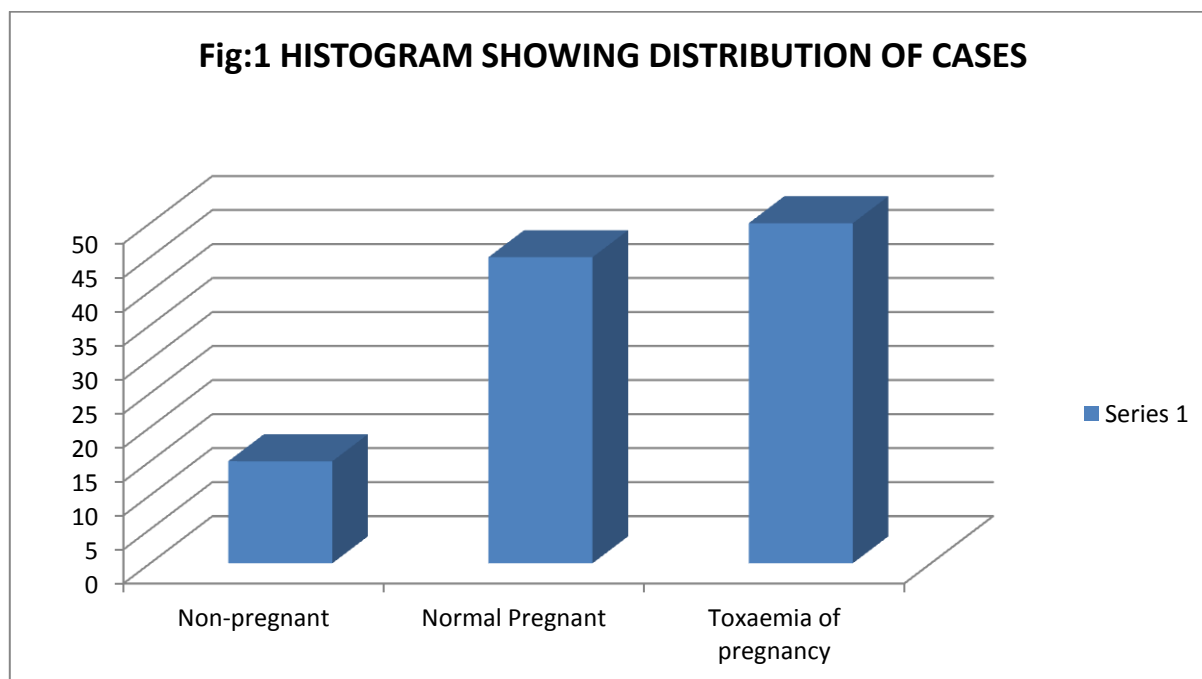


Table-2 Comparison of Serum Uric Acid (mg/dl) in Different Group of Cases

Variables	No. Of cases	Range	Mean	+SD	Significance P value
Non-pregnant	15	2-5.96	3.82	1.143	>0.1NS
Normal Pregnancy					
First Trimester	15	2.67-5.93	3.91	0.891	>0.05NS
Second Trimester	14	2.85-5.92	4.25	0.968	>0.05NS
Third Trimester	16	2.3-5.98	3.94	1.282	>0.05NS
Toxaemia of Pregnancy					
Pre-eclampsia	25	3.90-6.9	5.9	0.92	<0.001Sig.
Eclampsia	25	5.6-7.3	6.69	0.395	<0.01Sig.

FIG.2- HISTOGRAM SHOWING COMPARISON OF URIC ACID (mg/dl) IN DIFFERENT GROUP OF CASES

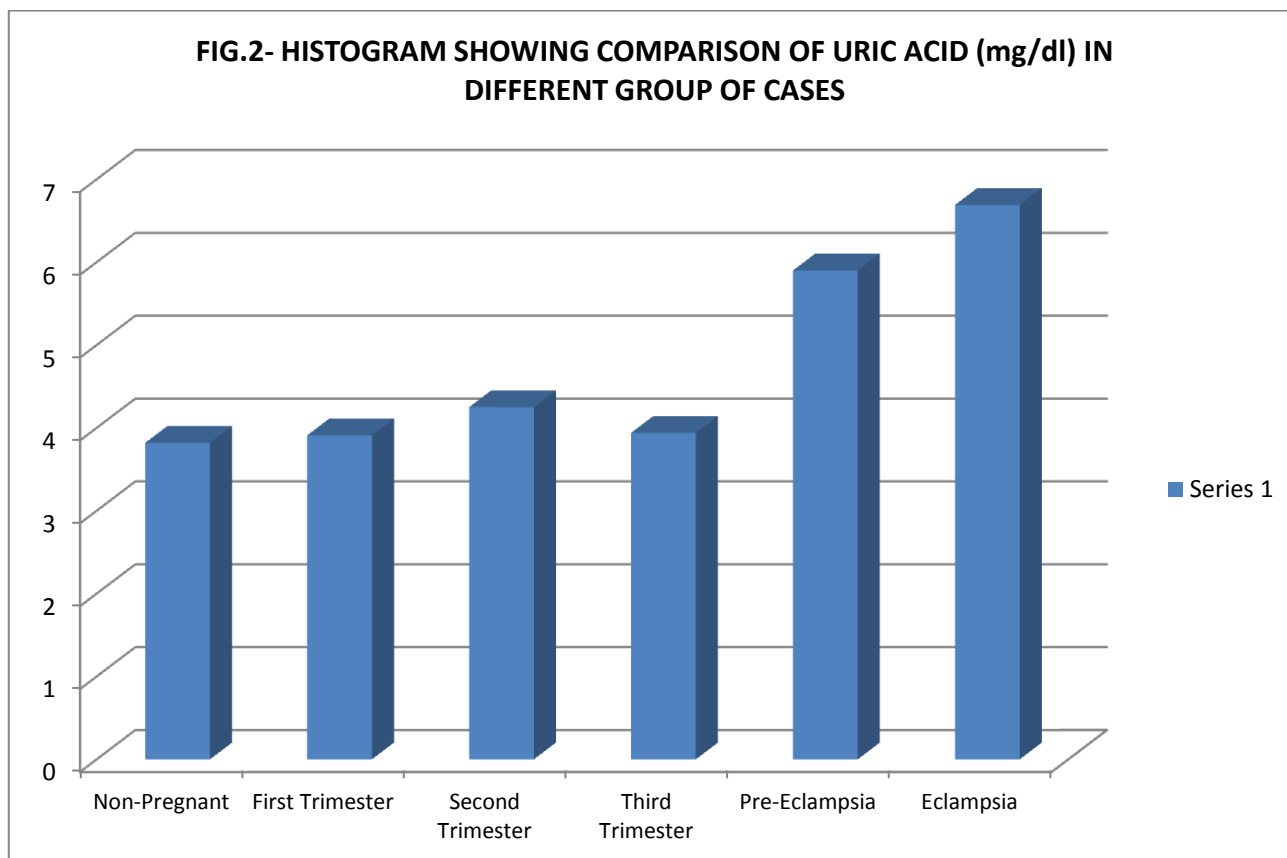


Table 2 shows there is no significant change in mean serum uric acid level in non-pregnant and normal pregnancy, but there is significant increase in mean serum uric acid in pre -eclampsia and eclampsia as compared to control group (non pregnant and normal pregnancy). There is significant increase in mean serum uric acid in eclampsia compared to pre-eclampsia.

Discussion

Uric acid is end product created during breakdown of Purine, most of it is excreted in urine to regulate normal level. Normal mean serum uric acid level in non-pregnant female is 2.5-5.6mg/dl,

and normal pregnant women in first, second and third trimester is 2-4.2mg/dl, 2.4-4.9mg/dl and 3.1-6.3mg/dl respectively.

In severe pregnancy induced hypertension mean serum uric was 6.65+0.60mg/dl. Toxaemia of pregnancy remain enigma despite many advances made. These constitute one of the common complication of gestation and contribute to be responsible for maternal and perinatal morbidity and mortality. The incidence of this disease has been considerably declined with nutritional education and improvement in socioeconomic status of population.

Table -2, and fig-2 showed serum uric acid in different group of cases. There was significant increase in serum uric acid in pre-eclampsia and eclampsia.

(Mustafi R, Gopalan S, Dhaliwal L, Sarkar Ak (1996) mar;50(3):68-71).

Eclampsia is major obstetric emergency which require mobilisation of efforts and adequate management to avoid catastrophic events. Unfortunately continued scientific probe into understanding the pathophysiology of this disease and causative factor is still unclear. But in spite of all these factors ,the incidence of this disease can be lowered by reducing serum uric acid.

Summary and Conclusions

The present study was carried out on total 110 cases of which 15 cases who were clinically normal and non-pregnant but in child bearing age, 45 cases were pregnant women in different trimester of pregnancy. 50 cases were suffered from toxemia of pregnancy.

The observation was subjected for descriptive analysis by Krauskalwallis statistics and p-value using chi-square test.

Mean serum uric acid in non pregnant, first, second and third trimester was 3.82+1.143mg/dl, $p>0.01$, 3.91+0.892mg/dl, $p>0.05$, 4.25+0.968mg/dl, $p>0.05$, 3.94+1.282mg/dl, $p>0.05$ respectively.

Mean serum uric acid in preeclampsia and eclampsia was 5.9+0.91,mg/dl, $p<0.001$ Sig and 6.69+0.395mg/dl, $p<0.01$ respectively. Mean serum uric acid level in pre-eclampsia patient found to be significant because p value was <0.001 .

In our present study trend was increase in serum uric acid in pre-eclampsia and eclampsia as compared to control group was significant statistically because p value was <0.001 .

Hyperuricemia is one of the important observation noted in toxemia of pregnancy and is important predictor of perinatal morbidity and mortality due to gestational hypertension.

Therefore measurement of serum uric acid is of great diagnostic and prognostic value in toxemia pregnancy and useful to assess maternal and perinatal morbidity and mortality. In this way worsening of the condition can be prevented as soon as diagnosis of pregnancy induced hypertension is established during early second trimester of pregnancy.

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