www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 79.54
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossrefDOI: https://dx.doi.org/10.18535/jmscr/v6i10.227

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Study of Renal Parameters in Preeclampsia

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Abstract
Preeclampsia is a pregnancy specific syndrome of reduced organ perfusion secondary to vasospasm and endothelial activation. In this study the renal parameters of preeclamptic patients were compared with normal pregnant ladies. 50 preeclamptic patients and 50 normotensive pregnant women were selected for the study. Blood was collected and blood urea, serum creatinine and uric acid were estimated and compared. It is seen that there is a significant elevation in B.urea, S.creatinine and S.uric acid in preeclampsia.
Keywords: *preeclampsia, urea, uric acid, creatinine, uteroplacental ischemia.*

Introduction

The word eclampsia dates from the 17th century. It is derived from a Greek word meaning 'to shine forth' because of the visual phenomenon accompanying the condition. The associated seizures were believed to be due to blood poisoning or toxins from the pregnancy. Hence it was termed toxemia of pregnancy. Alexander Hamilton (1781) described eclampsia as a condition associated with seizures. Bright in 1827 recognised albuminuria relating it to renal disease and eclampsia. In 1896, when the sphygmomanometer was invented, arterial hypertension was found to be associated with eclampsia. Uteroplacental ischemia and infarction, reduction in uteroplacental blood flow and uterine distension leading to hypertension and proteinuria through uterorenal reflex all have been implicated in preeclampsia[1,2]. Later with advancement of science, the emphasis was laid more on genetic, hematological, biochemical, hormonal and immunological explanations[3,4,5]. However none could be proved independently until date.

Hypertensive disorders complicating pregnancy are common and form one of the deadly triad along with hemorrhage and infection that results in much of the maternal morbidity and mortality related to pregnancy. The diagnostic criteria for preeclampsia includes hypertension and proteinuria. The mechanism in renal function alteration in preeclampsia is not well explained and the extent of elevated values of renal parameters in preeclampsia is not clear. Preeclampsia is commonly associated with

abnormalities of renal, hepatic and coagulatory function[6]. Compromised renal function may result in decline in glomerular filtration rate resulting in elevation of renal parameters. In this study renal parameters like blood urea, s.creatinine and s.uric acid of preeclamptic and normal pregnant ladies are compared and analysed.

Materials and methods

An approval was got from Institutional Ethics Committee. The study included 50 preeclamptic patients and 50 normal pregnant ladies. After obtaining informed written consent from each subject, personal informations were collected. Diabetics and patients with history of UTI, renal disorders and liver disorders wereexcluded from the study. Blood samples were collected and blood urea,s. creatinine and s.uric acid were estimated by standard methods[7]-[12].

Results

The mean value of blood urea in the study group is 20.30 mg/dl and in control group is 16.72. The blood urea in the study group is elevated and this elevation is found to be statistically significant (p value 0.001). The mean value of serum creatinine is 0.730 mg/dl in study group and 0.654 in control group. The increase in serum creatinine in the study group is found to be statistically significant (p value 0.002).The mean value of serum uric acid is 4.968 mg/dl in the study group and 4.448 in the control group. The increase in serum uric acid found in the study group is statistically significant (p value0.0160).

Table 1. Comparison of renal parameters in healthy controls and cases of preeclampsia

Parameter		Control	Case
Urea	Mean	16.72	20.30
	SD	2.031	7.363
	P value		0.001
Creatinine	Mean	0.654	0.730
	SD	0.0646	0.1542
	P value		0.002
Uric acid	Mean	4.448	4.968
	SD	0.7052	1.3158
	P value		0.016

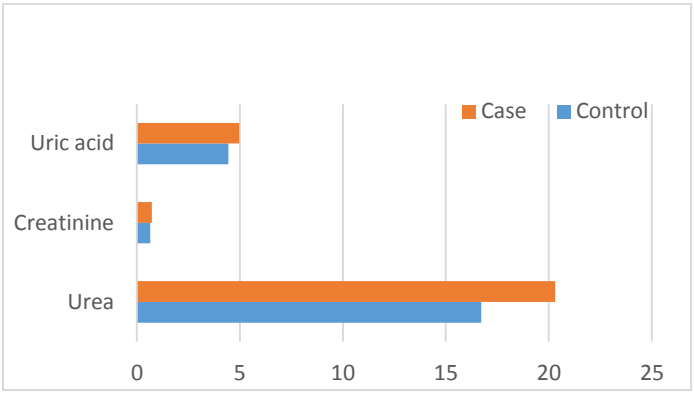

Fig 1 Renal parameters (mg/dl) in cases and controls

Discussion

In this study renal parameters, blood urea, creatinine and uric acid of 50preeclamptic patients were compared with 50 normotensive pregnant women. Allthese parameters showed significant elevations in preeclampsia. Many studies have shown an increase in renal parameters in preeclampsia[13,14,15]. As preeclampsia progresses there is a gradual decline in GFR and a state of progressive uremia develops. This occurs as a result of placental ischemia. Hyperuresemia is found to be the earliest biochemical change in preeclamptic uremia even before the appearance of proteinuria. Several studies showed that the extent of elevation of serum uric acid was an indicator of degree of severity of the condition[13,14,15].

In normal pregnancy the serum uric acid concentration is 25-35% lower than non-pregnant levels. This is due to increased glomerular filtration anddecreased fractional reabsorption of uric acid in the proximal renal tubules during pregnancy. But as a result of placental ischemia there is glomerularvasoconstriction and capillary bed damage. The resultant reduced GFR andincreased proximal tubular uric acid net reabsorption lead to raised serum uric acidlevels. Another reason for hyperuresemia is the antioxidant property of uric acid[16].Its elevation in blood may be a protective response opposing the oxidative stress inpreeclampsia. But whether it can be taken as a predictive marker in preeclampsia isnot clear.

Conclusion

The renal parameters almost always exhibit an elevation in preeclampsia.But whether these can be used as consistent predictive indicators for preeclampsia is not clear. Further well designed studies with larger samples are necessary in thisfield.

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