



ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

EFFECTS OF CORD BLOOD UREA, CREATININE AND URIC ACID IN RELATION TO NEONATAL OUTCOME IN HYPERTENSIVE DISORDERS OF PREGNANCY

KEY WORDS: Hypertensive disorder of pregnancy, creatinine, urea, uric acid

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ABSTRACT Hypertensive disorder of pregnancy are one of the leading causes of morbidity and mortality in pregnant mothers and their neonates in developed countries while they also play havoc and significant mortality in developing countries. There is much research work undergoing to detect the early onset of disease and also to predict the severity of disease which will help us in determining its management and lead to a favorable outcome for mother and baby. In the present study which was conducted on pregnant patients attending the hospital in third trimester we tried to evaluate whether maternal serum and cord blood urea, uric acid and creatinine had any relation with maternal and neonatal outcome and prediction of course of disease

INTRODUCTION :

Hypertensive disorders of pregnancy remain one of the most ancient disorders associated with pregnancy and yet much remains to research about the group of diseases. These disorders are one of the leading causes of maternal mortality in developed countries and are second only to Post-Partum Hemorrhage in developing countries, with the incidence varying from 5-15% . Eclampsia the severe form of spectrum is a serious obstetric condition which is associated with increased perinatal morbidity and death. Most perinatal deaths are related to prematurity, intrauterine death, intrauterine growth retardation and abruption placentae.

Hence, it is apparent from the above that for the reduction of an overall maternal and neonatal mortality and morbidity due to hypertensive disorders reliable and easy methods to diagnose them early are needed. Diagnosis is usually made on the conventional triad of edema, hypertension and proteinuria. Much research work is going on for early diagnosis and early prediction of severity of disease so that high risk pregnant women and their fetus are saved from the mortality and morbidity associated with the disease.

Whether kidney plays a primary or secondary role in the etiology of hypertensive disorders of pregnancy is not known but some derangement in renal function is certainly associated with it. Research into the serum levels of uric acid, urea and creatinine and its significance in relation to hypertensive disorder of pregnancy have been reported to be as early as 1962 with varied results¹ .On the basis of these studies it was postulated that uric acid is increased in hypertensive disorders of pregnancy and is proportionate to severity in pre-eclampsia². The urea content of amniotic fluid has been investigated by a number of workers in the past who found its level in the amniotic fluid to be higher than that of maternal and cord blood³.

Table: 1 – Mean blood urea, creatinine and uric acid levels

Hypertensive disorders of pregnancy	No of cases	Mean Blood urea (mg/100ml) Mean ± SD	Mean Serum urea (mg/100ml) Mean ± SD	Mean Serum uric acid (mg/100ml) Mean ± SD
Mild to moderate PET	22	24.77±4.24	1.55±0.34	3.47±0.71
Severe PET	10	30.10±2.51	1.85±0.43	4.14±0.86
Eclampsia	12	35.17±4.93	2.52±0.96	4.70±0.83

Table: 2 - Mean cord blood urea, creatinine and uric acid levels

Hypertensive disorder of pregnancy	No of cases	Cord Blood urea (mg/100ml) Mean ± SD	Cord Serum urea (mg/100ml) Mean ± SD	Cord Serum uric acid (mg/100ml) Mean ± SD
Mild to moderate PET	22	24.18±4.53	1.47±0.34	3.47±0.71
Severe PET	10	29.20±2.86	1.79±0.40	4.14±0.86
Eclampsia	12	34.42±4.62	2.55±0.81	4.70±0.83

And hence the present study was undertaken to study and compare prognostic values of blood urea, creatinine and uric acid in pregnancy in relation to hypertensive disorder of pregnancy and to study significance of cord blood urea, creatinine and uric acid in relation to fetal outcome

MATERIAL AND METHODS:

The healthy pregnant females and those suffering from hypertensive disorder of pregnancy were selected among those attending the outpatients department in department of obstetrics and gynecology of M.L.B. Medical College, Jhansi between December 2007 to August 2009 and those admitted in maternity and labour room during the same period, in last trimester of pregnancy, preferably within fifteen days preceding the delivery and the cases of toxemia of pregnancy were those admitted in the hospital in the third trimester of pregnancy near term

In all the cases a detailed history both past and present was taken including obstetric history. A thorough general examination, systemic examination and obstetric examination was done

Estimation of the blood urea level, serum creatinine and serum uric acid was carried out after dividing them in to:

1. Healthy pregnant females – control group
2. Pregnant females suffering from hypertensive disorders of pregnancy – study group. This group was further divided into mild and moderate eclampsia , severe pre – eclampsia and eclampsia

RESULTS:

Blood urea, serum creatinine and uric acid level was estimated in 44 cases of study group and was values were studied in subgroup the results were

Table: 3- Relation of birth weight to gestational age, cord blood urea, creatinine and uric acid levels

Birth Weight (gms)	No of cases	Mean gest age (wks)	Cord blood urea (mg/100ml) Mean±SD	Cord serum creatinine (mg/100ml) Mean±SD	Cord serum creatinine (mg/100ml) Mean±SD
1800-2100	10	36.2	33.0±3.77	2.54±0.42	4.75±0.48
2101-2400	9	35.6	31.67±5.90	2.04±1.14	3.98±0.91
2401-2700	14	36.8	25.70±3.75	1.52±0.34	3.61±0.55
2701+	11	36.7	23.55±5.30	1.43±0.38	3.17±0.46

DISCUSSION:

In our present study, a comparison was undertaken to assess the urea, creatinine and uric acid content in maternal blood and umbilical cord blood in normal and hypertensive disorders of pregnancy. Their level has been correlated with the severity of disease and the fetal weight and outcome. The blood urea in 25 normal pregnancy cases was found to have a mean of 20.08mg/100ml ± 4.84 while mean serum creatinine levels were 1.25mg/100ml ±0.44 and mean maternal serum uric acid was found to be 3.29mg/100ml ±0.46. No significant difference was found when the values were divided according to parity and period of gestation. In order to find out the normal levels of blood urea, creatinine and uric acid, estimation was done in 25 samples of blood withdrawn from umbilical vein at the time of delivery in normal pregnant cases. The mean umbilical cord urea level were 18.28mg/100ml±4.84 while mean umbilical cord serum creatinine levels were 1.26mg/100ml±0.44 and mean umbilical cord serum uric acid level were 3.34mg/100ml±0.41. It was found that maternal blood levels and umbilical cord blood level resembled closely and that period of gestation and parity do not affect cord blood urea, creatinine and uric acid levels. Out of 44 cases of hypertensive disorders of pregnancy, 25 cases belonged to 18 – 25 years age subgroup and 19 cases to 26 – 35 years age group. When birth weight was plotted in relation to cord blood urea, creatinine and uric acid levels it was evident that infants born to mothers with hypertensive disorders showed inverse relation to their increasing values. Our finding was consistent with the findings of Sjostedt (1956) : Kilpatrick and Mackay (1965) , Sinha and Mukerjee (1973) ; Sharma et al (1976) ; Ojha and Sarin (1979) and Randan (1984) who have correlated high cord blood urea with low birth weight in hypertensive disorders of pregnancy .

Our observations have already revealed that the maternal and cord blood urea , creatinine and uric acid concentrations rises with increasing severity of toxemia as the underlying physiology is of endotheliosis which impairs renal functions. The mean birth weight was found to decrease and the mean urea, creatinine and uric acid found to increase with increasing severity of hypertensive disorders of pregnancy. Our observations also resemble with the findings of Sjosted et al (1958) who after estimating non protein nitrogen concentration in umbilical cord blood of 804 neonates, showed that the concentration rises with increasing signs of dysmaturity and have postulated that raised plasma non protein nitrogen concentration in dysmaturity was caused by placental insufficiency which prevented the fetus from excreting non protein nitrogen from placenta. On statistical analysis a significant difference was observed between birth weight in mild moderate and severe PET which is self explanatory as birth weight was seen reduced with the severity of disease

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