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Original Article

Study of Acute Kidney Injury Associated with Pregnancy

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ABSTRACT

Background: *Pregnancy related acute kidney injury(PRAKI) is common in developing countries like India. The aim of the study was to identify the etiology, prognosis, management and to have preventable measures, to improve the maternal and fetal outcome.*
Methods: *The study was conducted in S.P. Medical College& Hospital – Obstetrics and Gynecology Department from July 2017 to December 2017.A total of 22 cases has been studied.*
Results: *The incidence of PRAKI was 1.3% in our hospital. Pregnancy induced hypertension, pre-eclampsia, eclampsia was found to be commonest cause. Incidence of PRAKI was high in third trimester. The outcome was favorable with complete recovery in 45.47% patients.*
Conclusion*: The low incidence of PRAKI was probably due to improved obstetric practices. Future research is further needed, to decrease the incidence.*

Key words: *PRAKI-Pregnancy related acute kidney injury, PIH-Pregnancy induced hypertension, HELLP- Hemolysis, elevated liver enzymes, low platelet count.*

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INTRODUCTION

Pregnancy related acute kidney injury refers to spectrum of prognosis ranging from potentially preventable to fatal. In developing countries, the incidence ranges from 4.2 to 15%. In developed countries, the incidence has decreased to 1% to2.8%. It has decreased after the disappearance of septic abortion and better perinatal care. Renal system undergoes anatomical and physiological changes during normal pregnancy.[1] Consequently, blood urea nitrogen (BUN) and creatinine concentrations are lower than the normal range. Hence a normal (BUN) or creatinine level in pregnant female may indicate underlying renal disease.[2] The common causes are preeclampsia, eclampsia, HELLP syndrome,[3,4] sepsis, abortion, obstetric hemorrhage, acute fatty liver of pregnancy, hemolytic uremic syndrome and thrombotic microangiopathy. Acute tubular necrosis is the common condition associated with good prognosis. The aim of this study is to evaluate the magnitude of PRAKI in TVMCH, to study the contributing factors, outcome, morbidity, mortality and to have appropriate preventive measures.

METHODS

The study was conducted in S.P. Medical College &Hospitals Obstetrics and Gynecology Department. Totally 22 patients

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with AKI were studied. Patients who were healthy previously and developed a urine output of <400ml/day, serum creatinine of >2 mg% were diagnosed to have AKI. Women, with no history of oliguria or renal disease prior to gestation, normal sized kidneys on ultra -sonogram, no history of hypertension or diabetes prior to study and no urological complication were included in the study. Detailed history, clinical examination and investigations were performed in all the patients. Nephrologist opinion was obtained for all the cases and treated accordingly. Hemodialysis or peritoneal dialysis was performed according to standard indications. Maternal outcome was recorded as complete recovery, partial recovery, death. Complete recovery was declared when renal function returned to normal range. Partial recovery, when showed improvement, but did not return to normal even after 12 weeks.

RESULTS

A total of 1600 patients who were admitted in obstetric and gynae department of S.P. Medical college were observed from July 2017 to December 2017.22 patients had acute kidney injury. The incidence of AKI in our hospital is 1.3%. Most of the patients were in the age group of 20-30 years with the incidence of 68.18%. 27.27% were in 30-40 years of age and 4.5% were in >40 years of age. In our study 77.28% belong to rural community and 22.72% belong to urban community. Regarding the obstetric code 50% were prime gravid, 22.7% were second gravida,9.09% were third gravida and 18.21% postnatal cases. 59.09% of patients with AKI was in 3rd trimester ,15% in 2nd trimester, 21.37% was in postnatal group and 4.5% in 1st trimester. Pregnancy induced hypertension-eclampsia and eclampsia constitute the major cause of AKI as 45%, obstetric Hemorrhage forms27.27%, sepsis forms 27.27%, TTP, HUS, MTP, HEV+VE-forms 4.54%. Major population was delivered by LSCS - 36.36%, Labor Naturalis forms 31.81%, IUD forms 9.09%, abortion forms 4.5%, hysterectomy forms 18.18%. Regarding fetal outcome 57.30% were delivered alive, 22.7% were alive while discharging from hospital. 31.81% were expired in Sick neonatal ward. 22.7% were intra uterine death and 19.98% were still born. 45.45% patients with AKI were on ventilator while treatment.54.55% were without ventilator support.25.28 % underwent hemodialysis, 18.18% underwent peritoneal dialysis, 13.63% underwent both hemodialysis and peritoneal dialysis. 56.54% were under medical treatment. In our present study,45.47% completely recovered, 27.27% partially recovered. Maternal mortality was 22.72%, one patient absconded from hospital 4.54%.

ETIOLOGY OF PRAKI

ETIOLOGY	NUMBER	PERCENTAGE
Pregnancy Induced Hypertension /Preeclampsia / eclampsia	9	45.45
Post-Partum Haemorrhage	2	9.09
Anti- Partum Haemorrhage	4	18.18
Sepsis	6	27.27
Hepatitis E Virus	1	4.54
Thrombotic Thrombocytopenic purpura	1	4.54
Haemolytic Uremic Syndrome	1	4.54
Medical termination of Pregnancy	1	4.54

MATERNAL OUTCOME

OUTCOME	NUMBER	PERCENTAGE
Completely recovered	10	45.45
Partially recovered	6	27.27
Death	5	22.72
Absconded	1	5

DISCUSSION

Acute Kidney Injury in pregnancy is a dreadful complication which deteriorates the prognosis of both the mother and the baby. Renal plasma flow increases by 50% to 70% during pregnancy in the first two trimesters.[5] Glomerular filtration rate increases from 97ml/min to 128ml/min by the end of first trimester. This results in a lower baseline serum creatinine levels than compared with similarly healthy nonpregnant individuals. Sodium decreases by 3mEq/L, calcium also shows a small decrease.[6] The incidence of AKI in developed countries is 1 -2.8%. In developing countries, it is 9-25%. In our present study, the incidence is 1.3%. This is like other studies.[7,8] This decline reflects the decrease in post abortal AKI and better perinatal monitoring. The average age of onset is between 20 to 30 years according to various authors[9] which corresponds with our study. In our study, 59.09% of patients with AKI were in the third trimester and 18.21% patients were in the postpartum period. Similar results were reported in Pakistan where the incidence was 36% in third trimester.[10] Different studies in India showed incidence in postpartum period as 75.6%.[11,12] In our study, the main cause of AKI was pregnancy induced hypertension 45%. Preeclampsia as a cause of AKI was identified as 12% in Pakistan and 75.2% in Turkey.[13] Septic abortion was a major cause in developing countries but not in our study. Complete recovery was seen in 45.45% in our study. Corresponding results were obtained from Arora et al,[14] Gopalini et al,[15] Erdemoglu et al showed 42%, 54.2%, 61% respectively. Maternal mortality was 22.72% in our study. Various studies in India showed maternal mortality of 20%. In Turkey, the rate was 10.6%, Pakistan Khalil et al showed 15%, 33.3% in Chaudhry et al[16] and Kumar et al.[17]

CONCLUSION

Pregnancy related AKI presents a challenging clinical situation. The major cause of Pregnancy related AKI shifts from sepsis to preeclampsia even in developing countries due to better obstetric care. Prevention of septic abortions, good perinatal care and better management of obstetric complications will bring down the incidence of PRAKI further.

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