



Renal disease in preeclampsia and eclampsia patients

*Dr Dayashankar Parauha ** Dr S K Shukla *** Dr N C Dwivedi
**** Dr A Gupta ***** Dr R K Yadav ***** Dr Rita Shukla

* Dept. of Medicine MLN Medical College, Allahabad

** , *** , **** Prof, Dept. of Medicine MLN Medical College, Allahabad

***** Lecturer, Dept. of Medicine MLN Medical College, Allahabad

***** Research Officer, Dept. Of Medicine MLN Medical College, Allahabad

ABSTRACT

BACKGROUND: Preeclampsia is a multisystem disorder affects 4%-5% of pregnancies. Preeclampsia-eclampsia being vascular endothelial disorders affects every organ system of the body, kidney being highly vascular bears the major burnt of the diseases. There is very little data available describing the renal involvement in patients with preeclampsia .

OBJECTIVE: To analyse the clinical spectrum of renal manifestation of preeclampsia and eclampsia in pregnant women.

METHOD: Diagnosis of preeclampsia was made using two cardinal feature of the disease after 20th weeks of gestation in previously normotensive and nonproteinuric women: (1) Blood pressure >140/90 mm Hg and (2) urinary protein excretion of > 300 mg/24 hour. The patients with renal manifestations were followed upto 12 weeks postpartum or till death whichever was earlier.

RESULT: Primiparity constitutes 58% of total patients. Hypertension and proteinuria were observed in all patients. Hyperuricemia was observed in 83.3% of cases. Acute renal failure occurred in 31.6% patients. HELLP syndrome was seen in 20% patients.

Keywords : Preeclampsia, Renal Disease, Hyperuricemia, Proteinuria

INTRODUCTION

Preeclampsia is a disorder of widespread vascular endothelial malfunction and vasospasm that occurs after 20 weeks' gestation and can present as late as 4-6 weeks postpartum. Preeclampsia affects 5-14% of all pregnancies.[1,2,3] Eclampsia is the occurrence of seizure in a women with preeclampsia with variable incidence (0.3% to 0.9%) and carry maternal mortality of 0.5-10%. Delivery of placenta reverse the clinical manifestation of disease suggesting that placenta has a central role in the pathogenesis of preeclampsia. Preeclampsia-eclampsia being vascular endothelial disorders affects every organ system of the body, but kidney being highly vascular bears the major burnt of the diseases. To the best of our knowledge, there is very little or no data available describing the renal involvement in patients with preeclampsia. The purpose of this study was to analyze the incidence and spectrum of kidney manifestation of preeclampsia-eclampsia in pregnant women at our hospital.

MATERIAL AND METHOD

Prospective study done between September 2011to August 2012 and Data gathered on demographic characteristics, age, gestational age(>20 wks), underlying disease, presenting signs and symptoms, blood pressure on admission, laboratory findings. Creatinine clearance calculated by Cockcroft-Gault formula . All patients with a diagnosis of preeclampsia-eclampsia based on the criteria of The American College of Obstetrics and Gynecology⁴ were included in the study consecutively. Preeclampsia was defined as the onset of hypertension and proteinuria after 20 weeks of gestation in previously normotensive and non-proteinuric pregnant women. Mild preeclampsia was defined as Blood pressure >140/90 mm Hg but < 160/110 mm Hg and proteinuria ranged between 300mg to < 5 gms/24hrs. Severe preeclampsia was defined

as presence of any of these (Blood pressure \geq 160/110 mm of Hg, urinary protein excretion of > 5gm in 24hrs, oliguria or < 500 ml in 24 hrs, visual disturbances, pulmonary edema or cyanosis, Right upper quadrant tenderness, fetal growth restriction, thrombocytopenia, and impaired liver function) features in a preeclamptic women. Eclampsia was defined as occurrence of new onset grand mal seizure in a patient of preeclampsia. HELLP syndrome was defined as elevation of liver enzymes (AST more than 70 IU/L), hemolysis (LDH more than 600 IU/L), and low platelet counts (\leq 1,00,000/mm³). If all the three parameters are present then it is said be "true" or complete and, if the platelet counts are between 1,00,000 – 1,50,000/mm³ it is termed as partial HELLP syndrome. Acute renal failure was defined as elevated creatinine of \geq 1.5 mg/ dl or oligoanuria of \geq 24 hrs. Proteinuria was defined as 24 hour urinary protein excretion of \geq 300 mg. Nephrotic syndrome was defined as urinary protein excretion of \geq 3.5 gm/ 1.73 m²/day, associated with distinct lowering of serum albumin i.e. \leq 2.5 gm/ dl. Hypertension was defined as blood pressure \geq 140/90 mm of Hg on two occasions at least 6 hrs apart, in women not known to have hypertension in pre-pregnancy phase. Hyperuricemia was defined as elevated uric acid level i.e. \geq 5.5 mg/dl. Cases are selected from the patients who are attending medicine opd, obs and gyn OPD or are admitted in dept of medicine and Dept of obstetrics and gynaecology in SRN HOSPITAL ALLAHABAD as a case of preeclampsia and eclampsia. Patients with preexisting renal disease, hypertension, diabetes mellitus, gestational hypertension, active urinary tract infection and refusal to cooperate with the study were excluded. Detailed history was taken and complete physical examination was done in all patients. Data were gathered on demographic characteristics, gestational age, underlying disease, presenting signs and symptoms, blood pressure on admission, laboratory findings (including

complete hematology, biochemistry, 24 hour urine protein and ultrasonography of abdomen) complications during hospital stay and maternal death. Creatinine clearance was calculated by Cockcroft-Gault formulae. Dialytic support was instituted in patients with ARF if indicated. The renal manifestations (Proteinuria, hyperuricemia, nephrotic syndrome and acute renal failure) were recorded in individual patients.

RESULT

Preeclampsia is primarily regarded as a disease of first pregnancy. In our study 58% of patients were primigravidas and remaining 42% were multigravidas. Age group of preeclamptic women constitute of 17 to 35 years with mean age of 24.3 with SD 4.06. mild preeclampsia was found in 50% of pt out of which 33.3% are distributed in 21-30 yrs age group. Mean age of mild preeclampsia is 24.45 yrs.

Severe preeclampsia found in 15 patients(25%) of cases, out of which 12 (80%) are distributed in 21-30 yrs age group patients. With mean age of 25.25 yrs and standard deviation 4.03 . eclampsia were found in total 15 patients out of which most of the patient 10(66%) are in age group 21-30 yrs. Maximum no of cases are occurs in 31-35 weeks of gestation 16 patients (26.6%) while 11 patients are in gestational age group 20-24 weeks, 13 patients in between 25-30 weeks ,12 were in 36-40 wks gestational age, postpartum preeclampsia occurs in 8 patients. The mean gestational age at presentation was 30.44±5.02 weeks.

Raised serum uric acid ≥ 5.5 were found in 50 patients, 83.3%, 34 cases were in <35wks gestation age, only 10 patients were having serum uric acid < 5.5. out of which 5 are in <35 wks gestational age. Raised serum uric acid was also associated with renal failure out of 19 patients in which serum creatinine is more than 1.5 mg/dl, 18 patients were having serum uric acid more than 5.5mg/dl.

In our study out of 60 patients 19(31.6%) patients were having serum creatinine ≥ 1.5 , 10 patients (16.6%) were having early onset proteinuria. All (100%) patients were hypertensive . The mean 24 hour urinary protein excretion was 1.5±2.5 gms . The mean glomerular filtration rate was 65.4±35.024 ml/minute ranging from 21.4-182 ml/minute Creatinine clearance less than 30 is found in 5 (8.3%) patients between 30-60 found in 29 patients(48%) creatinine clearance between 60 to 90 was found in 17 (28.3%) , and creatinine clearance more than 90 was found in 8 (13.3%) patients. serum creatinine ≥ 1.5 mg/dl were found in 19 (31.6%) Thus ARF in our study was found in 31.6% of cases. Nephrotic syndrome was noted in 11.3% of cases. 7 patients. Oliguria was found in 17 patients 28.3%. In our study HELLP SYNDROME associated in 12(20%) of patient .

HELLP syndrome was higher in eclamptic women in comparison to preeclamptic women(11.6 vs 8.3%).

Discussion

Preeclampsia is a pregnancy specific vascular endothelial disorder with varying degrees of involvement of multiple organs, of which kidney bears the main crunch being a highly vascular organ. Preeclampsia is primarily regarded as a disease of first pregnancy. In our study 58% of patients were primigravidas and remaining 42% were multigravidas. Several other authors, Simpson JM et al and Mjahed K et al, have reported primiparity in 52-73% patients of preeclampsia.[6,7] Murphy DJ. Stirrat GM [8] also showed that Pre-eclampsia occurs mainly in first pregnancies. Another study of Trogstad et al. also showed primiparity is more common in preeclampsia. Study shows that primiparity is a risk factor for development of preeclampsia. Age group of preeclamptic women constitute of 17 to 35 years with mean age of 24.3 with SD 4.06. mild preeclampsia was found in 50% of pt out of which 33.3% are distributed in 21-30 yrs age group. Mean age of mild preeclampsia is 24.45 yrs.

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patients. With mean age of 25.25 yrs and standard deviation 4.03 . eclampsia were found in total 15 patients out of which most of the patient 10(66%) are in age group 21-30 yrs.

The mean age of our patients was 24.3±4.06 years which is similar to the observation of other studies of Simpson JM et al and Mjahed K et al. [6, 7]

Maximum no of cases are occurs in 31-35 weeks of gestation 16 patients (26.6%) while 11 patients are in gestational age group 20-24 weeks, 13 patients in between 25-30 weeks ,12 were in 36-40 wks gestational age, postpartum preeclampsia occurs in 8 patients. The mean gestational age at presentation was 30.44±5.02 weeks similar to the observation of Yoshino O et al and Aali BS et al. [7,9] The reported gestational age of onset of preeclampsia is more than 20th week of pregnancy in vast majority of patients, but recently a case was reported from Japan with typical features of preeclampsia occurring at less than 20th weeks of gestation Nishimura M, et al.[10]

Several risk factors has been identified with increased risk of preeclampsia. Pre-eclampsia in previous pregnancy, pre-existing diabetes, multiple pregnancy, family history, nulliparity, a raised BMI before pregnancy or at booking, maternal age >40 years, preexisting renal disease, hypertension, ≥ 10 years since the last pregnancy and antiphospholipid antibodies are associated with increased risk of developing pre-eclampsia. Risk factors for preeclampsia were noted in 52(86.6%) patients in present study.

Raised serum uric acid ≥ 5.5 were found in 50 patients, 83.3%, 34 cases were in <35wks gestation age, only 10 patients were having serum uric acid < 5.5. out of which 5 are in <35 wks gestational age. Raised serum uric acid was also associated with renal failure out of 19 patients in which serum creatinine is more than 1.5 mg/dl, 18 patients were having serum uric acid more than 5.5mg/dl.

Raised serum uric acid is also associated with renal failure having significant p value 0.0358. In a study conducted by William KP, Galerneau F,[11] on 459 pregnant women, significant elevation in serum uric acid levels over normotensive pregnant women (285+ 72micromole/L) was observed in both the gestational hypertension group (341+ 83 micro mole/l) and the pre-eclamptic group (384+ 93 micro mole/l), P-value being <0.001 and <0.05, respectively. Hyperuricemia was also found in a study by jai prakash et al in 93.3% of preeclamptic patient.

Early onset proteinuria is also significantly associated with renal failure in preeclampsia. In our study out of 60 patients 19(31.6%) patients were having serum creatinine ≥ 1.5 , 10 patients (16.6%) were having early onset proteinuria Murakami S et al in a study on Renal disease in women with severe preeclampsia or gestational proteinuria found that Nineteen of 86 women (22.1%), were diagnosed with underlying renal disease. Women with renal disease had a significantly earlier onset of proteinuria than those without (median 11 versus 32 weeks' gestation, $P < .001$). In women with severe preeclampsia, onset before 30 weeks' gestation was the best predictor of underlying renal disease . North et al.[12] examined outcome in 54 pregnancies with reflux nephropathy, 19% of which patients had proteinuria (>300 mg/24h) early in pregnancy.

All (100%) patients were hypertensive in this study and our observations were similar to other studies by Aali B.S et al. [9] The mean 24 hour urinary protein excretion was 1.5±2.5 gms and similar observations were made by other studies. Chames MC et al and Simpson JM et al [6,13] The mean glomerular filtration rate was 65.4±35.024 ml/minute ranging from 21.4-182 ml/minute Creatinine clearance less than 30 is found in 5 (8.3%) patients between 30-60 found in 29 patients(48%) creatinine clearance between 60 to 90 was found in 17 (28.3%) , and creatinine clearance more than 90

was found in 8 (13.3%) patients. serum creatinine ≥ 1.5 mg/dl were found in 19 (31.6%) Thus ARF in our study was found in 31.6% of cases. Nephrotic syndrome was noted in 11.3% of cases. 7 patients. Oliguria was found in 17 patients 28.3%.

This incidence of ARF in our study was 31.6 %, and reported incidence of ARF in several studies has varied from 4-30%. Sibai BM et al, [14]- Preeclampsia accounted for 28.57% of ARF study by K R Goplani et al shows similar observation to our study [15]. Murphy and Stirrat [8] also found ARF in 27% of preeclamptic patients. These differences in incidence can be attributed to definition used for ARF in various studies and patients population studied. In our study HELLP SYNDROME associated in 12(20%) of patient which is similar to other studies (10-20%). Stillman IE et al and Nouria S, et al [16,17]. Murphy and Stirrat (8) Also found similar incidence of (21%) ,HELLP syndrome in preeclamptic women.

HELLP syndrome was higher in eclamptic women in comparison to preeclamptic women (11.6 vs 8.3%). and observation was similar to study of Ali BS et al. [9]

Summary

In summary, Preeclampsia occurs mostly in first pregnancy 58% of preeclamptic patients are primipara and 42% were multipara. Age group of preeclamptic women constitute of 17 to 35 years with mean age of 24.

Maximum no of cases are occurs in 31-35 weeks of gestation 16 patients (26.6%) while 11 patients are in gestational age group 20-24 weeks, 13 patients in between 25-30 weeks ,12 were in 36-40 wks gestational age, postpartum preeclampsia

occurs in 8 patients.

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The mean glomerular filtration rate was 65.4 ± 35.024 ml/minute serum creatinine ≥ 1.5 mg/dl were found in 19 (31.6%) Thus ARF in our study was found in 31.6% of cases. Nephrotic syndrome was noted in 11.3% of cases. 7 patients. Oliguria was found in 17 patients 28.3%.

Proteinuria more than 3.5 gm/24hrs was found in 5 patients out of which 1 patient were having total urine protein 5.1gm/24 hrs. Early onset Proteinuria was seen in 28 patients out of which 10 patients having raised serum creatinine.

HELLP syndrome was seen in 12 cases (20%) with higher frequency in eclamptic than in preeclamptic women (11.6 vs 8.3%).

Conclusion

In conclusion preeclampsia mainly occurs in first pregnancy. preeclampsia was associated with acute renal failure in 31.6 % patients. Nephrotic syndrome 8.3% patients. Early onset proteinuria was associated with significant renal failure in preeclampsia patients.

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