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Original Research Article

A study on risk factors, maternal and foetal outcome in cases of preeclampsia and eclampsia at a tertiary care hospital of South India

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ABSTRACT

Background: Hypertension in pregnancy remains still a major health issue for women and their descendants throughout the world but remains a major issue in developing countries rather than developed countries. Eclampsia accounts for 24% of maternal deaths during pregnancy in India according to FOGSI study in India. Changing trends in pregnancy globally with increased maternal age of conception, assisted reproductive technologies has contributed a significant impact in the risk factors for PE and eclampsia. The present study was aimed to investigate and determine the related risk factors in cases of PE and eclampsia. The maternal and foetal outcomes with major complications of the women with PE and eclampsia were also studied.

Methods: A prospective cross sectional study for a period of two years was conducted at a tertiary care hospital among antenatal cases and all cases of PIH were recorded and studied. Cases were managed as per the existing obstetric protocol after clinical examination and investigations. Detailed socio demographic data and history of risk factors were collected and entered into Microsoft excel sheet and analyzed. Maternal and foetal outcome were noted in the cases of the study.

Results: The incidence of PE and eclampsia in the study was 43.3% and 10.8%, 25-35 years age group being the most common. PE and eclampsia was associated with BMI>30, parous women with previous history of PE, diabetes mellitus and more in unregistered cases. PE and eclampsia were more in Illiterates and socio economic class 2 &3. The incidence of maternal complications was 32.99% with premature labour being the common and in case of foetal complications prematurity was the commonest with 16 cases. The maternal mortality was very less with only 4.64% in the study.

Conclusions: Pregnancy induced hypertension with PE and eclampsia still remains a major problem in developed countries. Good antenatal care with increased awareness and increased antenatal visits may help in reducing the incidence and maternal and foetal complications. Increased incidence among illiterates and low socio economic status group provides the target group to be directed against any medical measures and national health programmes.

Keywords: Eclampsia, Preeclampsia, Pregnancy induced hypertension, Prematurity

INTRODUCTION

Hypertension in pregnancy remains still a major health issue for women and their descendants throughout the world but remains a major issue in developing countries rather than developed countries. Globally preeclampsia [PE] and eclampsia are responsible for approximately 14% of maternal deaths with variable incidences in developed and developing countries.[1] Eclampsia accounts for 24% of maternal deaths during pregnancy in India according to FOGSI study in India.[2] Gestational hypertension affects 5-10% of pregnancies, but is associated with fewer and less severe complications. Eclampsia is defined as the new onset of generalized

tonic clonic seizure in women with severe preeclampsia. PE is associated with cardio vascular complications in later life and also in their offspring. Most of the previous epidemiological studies focused and examined the risk factors of gestational hypertension and PE with useful information with respect to the etiological mechanism and prediction and management of hypertensive disorders of pregnancy.[3] Changing trends in pregnancy globally with increased maternal age of conception, assisted reproductive technologies has contributed a significant impact in the risk factors for PE and eclampsia. Most of the studies focused on risk factors like age etc and different diagnostic criteria for PE and eclampsia. PE and eclampsia are considered important in early diagnosis and management as both are associated with serious maternal and foetal outcomes and complications during pregnancy and in later life of mother and offspring.[4] Most of the studies have focused aiming at identification of maternal death risk factors but the diagnostic criteria were variable. However, the findings in different studies were inconsistent which may be attributable to different diagnostic criteria, heterogeneity of population etc. Proper antenatal care still remains an important part in prevention of PE and eclampsia with associated mortality and complications. Hence estimating each woman's individualized risk allows proper antenatal surveillance to be directed against those having a risk of PE and eclampsia. Hence always there is a need to develop an integrated model for estimation of individual risk factors for development of PE on the basis of various parameters.[5]

The present study was aimed to investigate and determine the related risk factors in cases of PE and eclampsia. The maternal and foetal outcomes with major complications of the women with PE and eclampsia were also studied.

METHODS

The present prospective cross sectional study was conducted at a tertiary care hospital for a period of two years from March 2015 to February 2017 by the Department of Gynecology and Obstetrics. All the antenatal patients attending the obstetrics OPD for regular visits were included in the study. All the cases that were diagnosed with preeclampsia and eclampsia during the visits or during the stay in the hospital were admitted. The socio demographic data (Age, weight, height etc) of all the antenatal patients were recorded by personal interviewing and thoroughly examined clinically for gestational age and blood pressure recordings were noted regularly during all the visits. Body mass index was calculated at the first antenatal booking visit. All the data was entered in a separate proforma sheet and noted. Cases with past history of seizures and known convulsive history were excluded from the study. Cases with ante partum eclampsia were included and intrapartum, postpartum eclampsia were excluded. Registered cases were defined as cases with a minimum of 4 regular antenatal visits to a health center or by a health worker as per WHO guidelines. All the cases of preeclampsia and eclampsia were defined and diagnosed as per the Guidelines of WHO. All the cases of eclampsia and preeclampsia were admitted in the hospital ward and followed till the delivery and maternal, foetal outcome was noted. Maternal outcome was registered as normal delivery, LSCS, complications and death. Foetal outcomes were measured as still birth, low birth weight, complications and good. The study was approved by the Institutional ethical committee and all the ethical guidelines were followed during the study period.

Case definitions

- Preeclampsia: Preeclampsia is defined as high blood pressure of 140/90 mm of Hg or more along with proteinuria 0.3g/24h or any derangement in platelet count, liver enzymes or renal function tests after 22 weeks of gestation.
- Eclampsia: Presence of convulsions that cannot be attributed to other causes in a woman with preeclampsia.

BMI of the case was calculated as per the WHO guidelines and Categorized as Normal range: 18.5-24.99; Overweight: ≥ 25; Pre-obese:25-29.99 and Obese: ≥30.[6]

RESULTS

The present study which was conducted at a tertiary care hospital for a period of two years recorded 388 cases of pregnancy induced hypertension among 18478 cases who visited for antenatal checkups during the study period. Out of 388 recorded cases, 178 were categorized as mild PIH (45.9%), 168 as preeclampsia (43.3%) and 42 as eclampsia (10.8%).

Of the 388 cases, maximum cases were in the age group of 26-35 years (166/388, 52.78%) followed in order by >35 years (32.47%) and 15-25 years (24.74%). The mean age of the patients in the study was 28±4.3 years. In our study, cases with mild PIH were maximum in 26-35 years (53%), preeclampsia in >35 years age group (46%) and eclampsia in 26-35 years group (20.5%). In our study, 51.03% of cases were illiterate, and maximum number of illiterate cases were observed in mild PIH group (49%), 45.3% of cases with preeclampsia were educated up to high school and no significant difference was observed among the graduates in categorization. With regards to socio economic status of cases in the study, as per Kuppuswamy's scale, 32.99% were placed in socio economic class-2 followed in order by class-4 (28.87%), class-3 (27.84%), class-1 (6.7%) and least in class-5 (3.61%).[7] Out of 42 cases of eclampsia there was no much difference in the cases in class-3 &4 but less number in class-5 where only 4 cases were recognized. 73.2% of cases were house wives and 26.8% were employers working in different categories. Most of the cases of mild PIH, preeclampsia and eclampsia were observed in housewives rather than employers. 59.28% of

cases were from joint family and the rest 40.72% from nuclear family. There was no significant observation and differences in the distribution of cases in the study with regard to type of family (Table 1).

Table 1: Socio demographic parameters of cases in the study.

Maternal age (Years)	Total	Mild PIH		Pre-eclampsia		Eclampsia	
		Number	%	Number	%	Number	%
15-25 years	96	45	46.9	35	36.5	16	16.7
26-35 years	166	88	53	44	26.5	34	20.5
>35 years	126	44	35	58	46	24	19
Total	388	178	45.9	168	43.3	42	10.8
Education (n=388)							
Illiterate	198	97	49	86	43.4	15	7.6
High school	150	67	44.7	68	45.3	15	10
Graduation	40	14	35	14	35	12	30
Socio economic class (n=388)							
Class 1	26	10	38.5	8	30.8	8	30.8
Class 2	128	67	52.3	52	40.6	9	7
Class 3	108	47	43.5	50	46.3	11	10.2
Class 4	112	48	42.9	54	48.2	10	8.9
Class 5	14	6	42.9	4	28.6	4	28.6
Occupation (n=388)							
House wife	284	124	43.7	130	45.8	30	10.6
Employer	104	54	51.9	38	36.5	12	11.5
Type of family (n=388)							
Nuclear	158	78	49.4	64	40.5	16	10.1
Joint family	230	100	43.5	104	45.2	26	11.3

Table 2: Risk factors of cases in the study.

Risk factors	Total cases (n=388) (%)	Mild PIH (n=178)	Pre-eclampsia (n=168)	Eclampsia (n=42)
		Number	Number	Number
BMI [Body mass index]				
<18.5	123 (31.70)	98	18	7
18.5-24.9	72 (18.56)	38	27	7
25 - 29.9	73 (18.81)	31	34	8
>30	120 (30.93)	11	89	20
Parity				
Nulliparous	138 (35.57)	102	22	14
Parous without PE	140 (36.08)	70	54	16
Parous with previous PE	120 (30.93)	16	92	12
Conception				
Spontaneous	322 (83)	150	138	34
Through ART	66 (17)	28	30	8
Diabetes mellitus (n=42)				
Type I	7 (16.7)	3	4	0
Type II	15 (35.7)	17	6	2
Gestational	10 (23.8)	4	4	2
Number of Babies				
Singleton	356 (91.75)	160	156	40
Twin	32 (8.25)	18	12	2
Registered	264 (68.04)	120	120	24
Unregistered	124 (31.96)	58	48	18

Table 2 clearly demonstrates the risk factors associated with the cases in the study. 30.93% of cases in the study had BMI >30 with 89 cases of preeclampsia, 20 cases of eclampsia and 11 cases with mild PIH. 36.08% of cases were parous without any history of preeclampsia and 35.57% were nulliparous and 30.93% cases with history of preeclampsia. Out of 120 cases with previous history of preeclampsia 92 cases developed preeclampsia,12 cases with eclampsia and 16 cases with mild PIH. 83 % of cases in the study conceived by natural methods, 17% of cases conceived by assisted reproductive technology. 42 cases in 388 (10.8%) were with diabetes mellitus in the study with 15 cases of type- II, 7 with type-I and 10 cases were identified as gestational diabetes mellitus. 68.04% of cases in the study were booked cases with minimum 4 antenatal visits and 31.96% gave no account of antenatal care in the pregnancy 24 cases of 264 cases developed eclampsia and 18 cases of unregistered cases. But 120 cases of registered developed preeclampsia and 48 of unregistered developed preeclampsia in the study. Statistical significance was associated with BMI, parity with previous history of Preeclampsia in the study. ('p' valve <0.005).

Table 3: Maternal outcome among cases in the study.

Maternal outcome	Number	%
Normal delivery	174	44.85
Caesarean delivery	68	17.53
Complications	128	32.99
Preterm labour	41	
Abruptio placentae	14	
Post partum hemorrhage	34	
HELLP syndrome	11	
Renal failure	12	
DIC	16	
Death	18	4.64

Table 4: Foetal outcome among cases in the study.

Foetal outcome	Number	%
Low birth weight	54	16.88
Still birth	24	7.5
Complications	40	12.5
Prematurity	16	
Birth asphyxia	8	
IUGR	8	
Intrauterine death	4	
Neonatal death	4	
Normal	202	63.13

Table 3 demonstrates the maternal outcome of cases in the study. 44.85% of cases had normal vaginal delivery, 17.53% had LSCS, most common reason being failure of induction and foetal distress. 32.99% of cases developed complications during the study of which 41 cases developed preterm labour, 34 cases with PPH, 16 with DIC, abruption placentae (14), Renal failure (12) and HELLP syndrome in 11 cases. The mortality was very less with 18 cases (4.64%).

Foetal outcome in the study is explained in table-4. 320 deliveries (82.47%) were conducted on 370 remaining cases after 18 deaths in the study.63.13% of cases recorded normal outcome, 16.88% with low birth weight, 7.5% with still birth and 12,5% of cases developed complications. Prematurity was the commonest (16 cases) and birth asphyxia (8), IUGR (8), Intra uterine death (4) and neonatal death (4).

DISCUSSION

In the present study, there were 18478 admissions out of which 388 cases were diagnosed with pregnancy induced hypertension with an overall incidence of 2.1%. The incidence of mild PIH in the study was 45.9%, preeclampsia 43.3% and eclampsia 10.8%. These findings of our study were on par with the findings of Duley et al and contrary to the findings of Shalini et al who reported the incidence of eclampsia as 14% and PIH as 8% in her study.[8,9] The maximum cases in the present study were between 26-35 years with 52.78% which coincides with the findings of many studies globally but a study conducted by Bhattacharya S has found maximum cases in age group of 15-25 years, however the study group is always variable factor depends upon the region and not a constant feature.[10] Most of the identified cases in the present group were illiterate, and placed in socio economic class 2 and 3 as per Kuppuswamy's classification. Illiteracy and low socio economic status are always associated with lack of adequate knowledge regarding antenatal care and importance of antenatal visits regarding maternal morbidity and complications. Most of the cases were house wives and from joint families. However, occupation and type of family has no proven influence on the pregnancy induce hypertension, preeclampsia and eclampsia. Few studies mention PE to be observed mostly in cases from joint families than single or nuclear family.

Risk factors: Most of the studies conducted earlier identified, extremes of maternal age, twin paternity, nulliparity, increased BMI, increased systolic and diastolic blood pressure during early pregnancy and presence of gestational diabetes are risk factors in development of PIH and eclampsia. In our study, the incidence of eclampsia and PE was observed maximally in cases with BMI>30 and mild PIH in cases with BMI<18.5 which is an unusual feature in our study. The incidence of eclampsia and PE in our study was similar to the findings of Duckitt K in his study.[11] In present study, the incidence of diabetes cases was 10.83%, with 35.7% type-2 Diabetes and 16.7% with type-1. 23.8% of cases developed gestational diabetes mellitus. The incidence of PIH among the diabetics in the study was 57.14%, PE was 33.34% and Eclampsia was 9.5%. Ros et al. quoted that in diabetic women, high levels of plasma triglycerides cause endothelial cells to accumulate

triglycerides leading to endothelial cell dysfunction that predisposes to develop high blood pressure.[12] In the present study, 68.04% of cases were booked with adequate antenatal care and 31.96% were unregistered without antenatal care. The incidence of PE in unregistered cases was 38.70% and eclampsia was 14.51% which was comparable with the findings of Sudarsan et al and Tukur et al in their studies.[13,14] 66 cases in our study, were conceived by ART of which 12.12% developed eclampsia, 45.45% developed PE. Studies on this regard are very limited and could not be compared. Parity with previous history of PE is a significant risk factor as mentioned earlier in many studies, which was also observed in our study also with an incidence of 10% with eclampsia and 76.7% with preeclampsia. Findings of our study were coincident with the findings of Cincotta RB et al in his study.[15]

Maternal outcome: In the present study the incidence of normal delivery; LSCS was 44.85% and 17.53% which was almost similar to Minire An et al who reported normal delivery as 52% and LSCS as 21% in his study.[16] The incidence of complications in our study was 33%, the commonest being preterm labour affecting 41 out of 128 cases, (32%) and followed by post partum hemorrhage (26.56%), DIC (12.5%), abruptio placentae (10.93%) and renal failure, HELLP syndrome(9.3%). Out of 34 cases that developed PPH 12 cases required blood transfusion. Similar findings were reported by Naseer D et al but contrary to Al-Mulhim AA et al who reported abruption of placentae as the most common and HELLP syndrome in 18% of cases in his study.[17,18] The incidence of maternal mortality in our study was 4.64% which is very less compared to the findings in the studies of Singhal S et al in their study who reported the incidence as 8.7%.[19]

Foetal outcome: Prematurity was the commonest foetal complication in our study with 40% followed by birth asphyxia, IUGR (20%) and Intra uterine death in 10%. These findings of our study were similar to many studies earlier but contrary to the findings of Kapoor et al who reported birth asphyxia as the most common complication in his study.[20] Foetal complications were more commonly observed in cases of severe eclampsia and preeclampsia than in cases with mild PIH.

CONCLUSION

To conclude, pregnancy induced hypertension with PE and eclampsia still remains a major problem in developed countries. Good antenatal care with increased awareness and increased antenatal visits may help in reducing the incidence and maternal and foetal complications. Increased incidence among illiterates and low socio economic status group provides the target group to be directed against any medical measures and national health programmes. Identifying the cases at an early period by regular recording of blood pressure at every visit, history of previous PE and diabetes mellitus always helps in identification of cases early and proper institutional management reduces the maternal and foetal deaths due to preeclampsia and eclampsia.

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