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RISK FACTORS FOR ADVERSE PREGNANCY OUTCOME IN ECLAMPSIA IN A TERTIARY CARE CENTRE

Gynaecology

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ABSTRACT

Aim: To determine the factors responsible for adverse pregnancy outcomes in eclampsia and assess the pregnancy outcome in eclampsia.

Materials and methods: A prospective study was carried out for a period of 2 months which included evaluation and assessment of all cases of eclampsia admitted in the hospital.

Results: The present study found that eclampsia was more common in the age group of 21 – 25 years of age (71.73%) and amongst primigravida (60.87%) with the preponderance higher in unbooked cases (54.35%) than in booked cases (45.55%), which was statistically significant with p value = 0.026 (on applying z-test). Of the 46 cases of eclampsia, 6 cases of maternal death occurred, giving an incidence of 13.04%. The correlation between the incidence of maternal mortality and the number of convulsions was found to be statistically significant with p value = 0.0087 (on applying z-test) Acute renal failure was found to be the most common maternal complication followed by disseminated intravascular coagulation, post partum hemorrhage, cerebrovascular episode and HELLP syndrome.

Conclusion: This study helps us conclude that the leading reason for women developing eclampsia and related complications is due to lack of adequate antenatal care and awareness of importance of the same.

Therefore, there is a need for awareness of ANC care and proper referral to tertiary care facilities.

KEYWORDS

INTRODUCTION

Eclampsia is defined as occurrence of seizures during pregnancy or usually within 48 hours of termination of pregnancy but may occur upto 7 to 10 days postpartum [1]. It is usually associated with preeclampsia. It remains a significant cause of maternal and perinatal morbidity and mortality, more so in a developing country like ours. In the fifth century itself, Hippocrates had noted that headaches, convulsions and drowsiness were ominous signs associated with pregnancy, but even today in the 22nd century, not all cases of eclampsia can be prevented.

Though there are many theories regarding the etiology of eclampsia, the exact cause or causes have not yet been defined. It has, however been hypothesized that unknown factors that may be placental in origin, provoke activation and dysfunction of vascular system resulting in widespread cell changes with multi-organ involvement [2,3,4].

The onset of eclampsia is generally abrupt and is associated with 4 stages consisting of [5]

- Premonitory stage associated with unconsciousness, twitching of muscles of face, tongue, limbs and rolling of eyeballs or eyeballs turned to one side and fixed. This lasts for about 30 seconds.
- Tonic stage in which the whole body goes into tonic spasm, lasting for about 30 seconds.
- Clonic stage wherein all the voluntary muscles undergo alternate contraction and relaxation. Tongue bite may occur. This stage lasts for 1 – 4 minutes.
- Stage of coma in which the patient passes into a stage of coma. It may last for a short period of time or may remain till the next convulsion.

Women at high risk of seizures usually have severe preeclampsia and hypertension, proteinuria with or without oedema, headache, nausea, vomiting, blurring of vision/photophobia and epigastric pain.

An eclamptic seizure occurs in 2 to 3 percent of severely preeclamptic women not receiving anti-seizure prophylaxis; the seizure rate is estimated to be between 0 and 0.6 percent in women with mild preeclampsia [6]. The incidence of eclampsia has been relatively stable at 1.6 to 10 cases per 10,000 deliveries in developed countries [7,8,9,10,11,12].

In developing countries, however, the incidence varies widely: from 6 to 157 cases per 10,000 deliveries [13,14,15]. In India the hospital incidence ranges from 1 in 500 to 1 in 30[5].

Majority of cases of eclampsia are young primigravidas who have received no or very little antenatal care. As eclampsia is usually preceded by features of severe preeclampsia, it can be adequately managed and its resulting complications averted if preeclampsia is detected and managed in time. For this, availability and access to proper antenatal care is necessary. The use of antihypertensives and magnesium sulphate therapy are the cornerstones in management of severe preeclampsia thereby preventing eclampsia[16].

Eclampsia is associated with significant morbidity and mortality for mother and the baby. Despite a steady reduction in mortality rate in developing countries it still remains a significant reason of maternal mortality. Preeclampsia which usually precedes eclamptic seizures starts with a placental trigger followed by a maternal systemic response. Because both this systemic response and the mother's reaction to it are inconsistent, the clinical presentation varies in time and substance, with many different organ systems affected.

With the increasing understanding of the disease process, there have been advances in management of eclampsia. However, in India, eclampsia still remains an important cause of maternal morbidity and mortality. In spite of the various studies conducted on hypertensive disorders in pregnancy in general and eclampsia in particular, very few studies tell us about the risk factors for eclampsia in low resource setting. The present study is a small attempt to realize these factors so that both the stakeholders in this situation are benefitted.

AIMS AND OBJECTIVES

PRIMARY

To determine the factors responsible for adverse pregnancy outcomes in eclampsia.

SECONDARY

To determine the pregnancy outcome in eclampsia.

MATERIAL AND METHODS

An observational study entitled “RISK FACTORS FOR ADVERSE PREGNANCY OUTCOME IN ECLAPMSIA IN TERTIARY CARE CENTRE” was carried out in the Department of Obstetrics and Gynecology of a tertiary care centre in a metropolitan city.

STUDY DESIGN

The present study is a prospective study.

STUDY SETTING

Department of Obstetrics and Gynecology of a tertiary care centre.

STUDY PERIOD

11th June to 12th August 2013.

STUDY POPULATION

All cases of eclampsia admitted in our hospital.

SELECTION

Inclusion criteria

All women presenting with antepartum, intrapartum or postpartum convulsions, admitted in our hospital during the study period.

Exclusion criteria

Women, with history of epilepsy in the past, or, with documented history of convulsions due to any other cause.

METHODOLOGY

The approval of the ethics committee of the institute was obtained prior to the commencement of the study.

In our study, cases with 3 or more antenatal check-ups at our hospital or at any other government set-up or a private set-up were considered as booked cases. Others were considered as unbooked cases.

All patients with eclampsia admitted in our hospital during the study period (either admitted with eclampsia or developed seizures in the ward) were included. Eclamptic patients treated somewhere else and referred to our hospital were also included. Informed consent was obtained from each woman that had been recruited into the study. All patients were managed according to the protocol of the department. All the pregnant women fulfilling the criteria were interviewed either on admission or as their condition stabilized using a standardized questionnaire. Thereafter follow-up was maintained till discharge or death.

At first, demographic characteristics such as Name, Age, Indoor registration number, socioeconomic status, and education & residential address were collected by interview with the patient or the patients' relatives.

Routine obstetric, menstrual, past, personal history and family history were enquired into. General examination of the patient - consciousness, temperature, pulse rate, pallor, edema feet, blood pressure, icterus, reflexes, and thyroid were examined. Cardiovascular, respiratory and central nervous system were examined. Obstetric examination as per abdomen, per speculum and per vaginal findings on admission were included.

All the investigations of preeclampsia and eclampsia such as hemoglobin, platelet count, 24 hours urine albumin, coagulation profile, liver function tests, kidney function tests, renal scan, fundoscopy and USG Doppler if possible was also conducted.

Information regarding the treatment received in the form of anti-hypertensive drugs, anticonvulsants, Pritchard's regimen and antibiotics received were also noted.

The data regarding the onset of convulsions whether ante partum, intra partum or postpartum, number of convulsions and associated complications was collected. If patient had been referred from some other place, to our centre, details about her obstetric examination, number of convulsions that had occurred, cause of referral and treatment received at that particular place, time lapse between referral and admission to our institute was noted.

The data regarding pregnancy outcome was noted such as whether the delivery was preterm or fullterm, birth weight of baby, live or stillborn, in case of stillborn whether fresh or macerated, date and time of delivery, whether spontaneous or induced, if induced then the method of induction, reason for induction, induction delivery interval, mode of delivery in the form of vaginal or forceps (or) vacuum delivery (or) by caesarean section. If instrumental delivery or caesarean section, the indication of the same are noted.

Also complications encountered during pregnancy, labour and postpartum such as accidental hemorrhage, disseminated intravascular coagulation, HELLP syndrome, hypertensive encephalopathy, postpartum hemorrhage were all noted. Maternal outcome in terms of morbidity and mortality was also noted. In case of maternal mortality the date, time, cause and the duration from admission to death was also collected.

Neonatal outcome as to whether baby was live / stillborn, fullterm /preterm, gestational age. Apgar score at 1 and 5 minutes, whether baby required resuscitation (or) whether it was admitted in neonatal unit (or) neonatal intensive care unit was noted. If there was neonatal mortality then the date, time and cause of death along with the delivery-death interval was noted.

Statistical analysis was done using

- z – test, to verify if the proportions are significantly different.
- Diagrammatic representation of data.

OBSERVATIONS AND RESULTS

There were a total of 46 cases of eclampsia during study period. Of these 40 delivered in our hospital and 1 remained undelivered, 2 were home deliveries and 3 were outside deliveries that had been referred to our hospital for further management. A total of 1810 deliveries took place in our hospital from the 11th of June to the 12th of August 2013. Thus the incidence of eclampsia during the study period was 2.52%.

Table 1 Age distribution

Age	Eclampsia	
Groups	No.	%
<21	6	13.04%
21-25	33	71.73%
26-30	6	13.04%
31-35	0	0
>35	1	2.17%

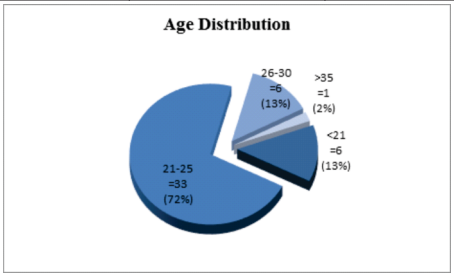

Figure 1. Age Distribution.

This table shows that maximum incidence of eclampsia i.e. 71.73% was found to be in the age group of 21-25 years. There were 6 cases of eclampsia i.e. 13.04% below 21 yrs and between 26-30 years. There was only one case of eclampsia above 35 years of age.

Table 2 Distribution according to gravidity.

Gravidity	Cases	
	No.	%
Primigravida	28	60.86
Multigravida	18	39.13

Incidence of eclampsia was more in primigravida as compared to multigravida. Out of 46 cases of eclampsia, 60.86% i.e. 28 cases were primigravida, 39.13% i.e. 18 were multigravida.

Table3 Distribution according to Socio economic (financial) status

Socio-economic	Eclampsia (n=46)	
status	No.	%
(Rs. per month)		
>4999	5	10.86
2500-4999	6	13.04
1500-2499	21	45.65
<1499	12	26.09
unemployed	2	4.35

In our study it was found that the incidence of eclampsia was higher in low socioeconomic group as compared to the high socioeconomic group.

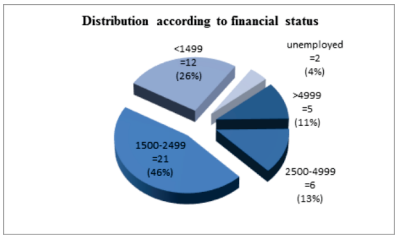

Figure 2. Distribution according to financial status.

Table 4 Distribution according to education

Education	Cases of Eclampsia (n=46)	
	No.	%
Illiterate	7	15.21
1st-5th	6	13.04
6th-8th	12	26.09
9th-12th	19	41.30
UG	1	2.17
Graduate	1	2.17
PG	0	0

In our study when we compared the incidence of eclampsia in relation to literacy, it was found that majority were educated up to 12th or below. The incidence rate in those that were illiterate and those educated till 12th was considerably higher, that being 15.21% in illiterate category, 13.04% in the category of 1st-5th standard, 26.09% in the category of 6th – 8th standard and 41.30% in the category of 9th – 12th standard. The incidence of eclampsia sharply reduced in those that were educated above 12th standard. Only 2.17% of those educated above 12th standard showed incidence of eclampsia. And only 2.12% of those that had completed their undergraduation presented with eclampsia. Thus, as the literacy level increases, number of mothers suffering from eclampsia decreases.

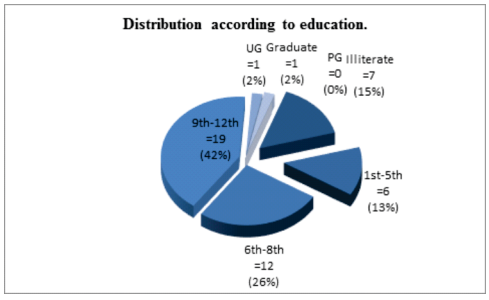

Figure 3. Distribution according to Education.

Table 5 Distribution according to booking status.

Booking status	No.	%
Booked	21	45.65
Unbooked	25	54.35

Patients with 3 or more antenatal checkups either at our hospital or other hospitals such as medical clinics or sub-centers or primary health centers were considered as booked cases. Out of 46 cases 21 cases i.e. 45.65% were booked and 25 cases i.e. 54.35% were unbooked.

When booked and unbooked cases were compared, it was found that the preponderance of eclampsia was higher in unbooked cases than in booked cases. The incidence of eclampsia was low in women who were booked at various health facilities including our hospital. It was found to be high in unbooked cases.

Among the 21 booked cases, 5 were booked at tertiary care centre. Of these, 2 had visit more than one month prior to onset of convulsions and the other 3 developed convulsions postpartum.3 were booked with ANM's, 9 were booked at government health facilities like PHC's or regional hospitals and 4 were booked at private hospitals. These 16 cases were referred to our centre after they developed convulsions.

Out of 25 unbooked cases 72% (18 cases) did not have any antenatal checkup anywhere. Remaining 28% (7 cases) had some sort of antenatal checkup either at other hospitals or local medical clinics or sub-centres or primary health centres. This type of inadequate care and infrequent visits leads to a false sense of security to the patient leading to late diagnosis and ultimately late referral. Out of these 7 cases 2 cases were diagnosed as Pre-eclampsia and were started on methyldopa. One patient delivered at home and had convulsions within 2 hours of delivery. Other patient had convulsions 2 days after starting methyldopa.

Out of 21 cases that were booked, PIH was detected in 1 case and she was on antihypertensive treatment. She had convulsions in the postpartum phase.

Amongst those unbooked, common reasons given was illiteracy and lack of awareness about antenatal care.

Out of those referred, 20 patients received magnesium sulphate. 6 received other drugs like methyldopa/nifedepine/phenytoin. 15 patients did not receive any treatment at the referring facility.

One patient, booked at regional hospital, had family history of sister with severe PIH. Another patient had h/o antepartum eclampsia in previous pregnancy; she was a booked patient but had not received any prophylactic treatment.

Table 6 Distribution according to time required to reach hospital.

Time required to	Cases of eclampsia	
Reach	No.	%
<1hr	14	30.43
1-5hr	13	28.26
5-12hr	18	39.13
>12hr	1	2.17

In our study, it was found that 28.26% reached our hospital within a time interval of 1-5hrs, 39.13% reached within 5-12hrs, 30.43% reached within 1 hr. These patients were usually referred from health facilities nearby for further management or were those booked at our hospital. 1 patient required more than 12 hrs to reach our hospital due to traffic congestion and unavailability of means of transport.

4 patients used private ambulance as means of transport. 6 patients reached our hospital in an auto rickshaw. The remaining patients used government ambulances to reach our hospital.

Table 7 Distribution according to mode of delivery.

	Vaginal		LSCS
	Spontaneous	Induced	Emergency
No.	12*	16	18**

*patient with twin pregnancy, 1st baby delivered vaginally.
**patient with twin pregnancy, 2nd baby delivered by LSCS.

In our study the mode of delivery was found to be vaginal in 28 cases of which 12 cases delivered spontaneously and 16 cases were induced. One patient remained undelivered.

There were 3 outside deliveries and 2 home deliveries which have been included in spontaneous vaginal delivery group. There were 3 twin pregnancies of which 2 underwent cesarean section. One patient with twin pregnancy delivered the 1st baby vaginally but due to transverse lie of second baby, she underwent emergency LSCS. She has been included in both the categories.

LSCS was done in 39.13% (18 cases) of the cases. The major indication for cesarean section was eclampsia with fetal distress along with either accidental hemorrhage or IUGR or prolonged labor or unfavorable cervix.

Table 8 Correlates of maternal outcome with booking status*

Complication	Booked	Unbooked
HELLP	1	1
DIC	1	3
Abruptio placentae	1	0
Acute Renal Failure	0	5
PPH	0	3
Pulmonary edema	0	1
Cerebrovascular episode	1	2
Post partum psychosis	1	0
Ocular complication	0	1
Maternal mortality	2	4
Status eclampticus	0	1

*multiple responses allowed

Various complications were encountered in our study. HELLP syndrome was seen in 2 cases. Disseminated intravascular coagulopathy was encountered in 4 cases. Incidence of abruptio placentae was seen in 1 case. 5 patients suffered from Acute Renal Failure. Pulmonary edema occurred in 1 case. Complications arising from cerebro-vascular episodes were seen in 3 patients. There occurred 1 case of post partum psychosis. Post partum hemorrhage occurred in 3 cases. Ocular complication of hypertensive retinopathy was encountered in 1 case. Status eclampticus was seen in 1 patient.

In the present study, it was found that 5 of 21 women in booked category, and 13 of 25 women in unbooked category, developed complications. The difference of proportion in these two categories as regards to complications was found to be significant (using z – test) ***p value = 0.026***.

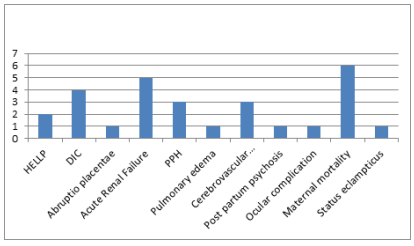

Figure 4.Cases of maternal complications.

Table 9 Maternal Mortality

Total number of cases	Alive	Dead
46	40	6

Out of the 46 cases of eclampsia in our study, there were 6 cases of maternal death, giving an incidence of 13.04%.

Case 1- She was a booked case at a private hospital, first antenatal check up done at 16 wks, in total 8 antenatal checkups were done. She did not have pre-eclampsia. She was referred to our hospital as a case of primi with eclampsia with query HELLP syndrome with HbsAg positive. She was given MgSO4 full loading dose at the referring medical facility. Time required to reach our hospital was 15 hrs, means of transport was a private ambulance. Delay was due to heavy traffic and difficulty in acquiring means of transport. She was admitted in our hospital at 34 wks of gestation with h/o 3 episodes of convulsions, h/o of jaundice, vomiting, low grade fever since 3-4 days. Examination on admission revealed her to be unconscious, having low grade fever, pulse rate 110/min, BP 110/70, no edema, icterus present, reflexes absent. Ultrasonography was done and it showed intrauterine fetal demise. She was induced and delivered vaginally a near term IUD macerated male fetus. She died on day 3 post delivery due to hepatic encephalopathy with HbsAg positive with coagulopathy with chronic renal failure with peripheral circulatory failure.

Case 2- She was an unbooked case of primigravida with antepartum eclampsia, referred from a sub centre to our hospital. She received Inj. phenytoin as anticonvulsant at the referring centre. Time required to reach our hospital from the referring centre was 6hrs, means of transport used was private four-wheeler. She was admitted in our hospital at 34 wks of gestation with h/o 3 episodes of antepartum generalized tonic clonic convulsions. On examination she was unconscious, febrile, pulse rate of 160/min, BP of 180/120, pallor and edema were present, mild icterus was observed, reflexes were absent, respiratory rate was about 20/min. she did not receive magnesium sulfate. Labor was induced and she delivered vaginally full term macerated stillborn female. She died on 2nd postnatal day. Cause of death was eclampsia with acute febrile illness with query malarial fever with hepatitis with septic shock with respiratory failure with chronic renal failure.

Case 3- She was an unbooked case admitted in our hospital with labor pains. She was taken for LSCS with indication of primigravida with impending eclampsia with unfavorable cervix. LSCS was done under spinal anesthesia. She received full dose of Inj. magnesium sylphate prior to LSCS. She delivered preterm live female baby. Postoperatively she received Inj. phenytoin. She had 5 episodes of convulsions post partum day 3. On examination she was semiconscious, irritable, febrile, BP 170/110, pulse rate 116/min, icterus present, reflexes absent. She developed complications of HELLP syndrome, hepatic encephalopathy, septicemia, septic shock, peripheral circulatory failure and died on 6th post operative day.

Case 4- This primigravida patient was an unbooked case of antepartum eclampsia. She visited an ANM only once at 24 wks of gestation when she received Injection Tetanus toxoid. She was referred from primary health centre as a case of eclampsia with HELLP syndrome after giving Inj. MgSO4 loading dose, Inj. phenytoin and i/v mannitol. Time required to reach our hospital was 8 hrs and means of transport used was government ambulance. She was admitted to our hospital at 30wks of gestation in an unconscious state. She had had 10 – 12 episodes of tonic clonic convulsions occurring antepartum and was unconscious since 1st episode of convulsion. She remained undelivered. She went into coma and had complications of disseminated intravascular coagulation, intra cerebral hemorrhage, chronic renal failure and died on the same day within 3 hours of admission.

Case 5 – She was a primipara, booked with ANM and had 5 antenatal checkups. She had delivered twins at sub centre and had been referred to another government hospital in view of severe PPH. She was treated for PPH with 20 blood transfusions and 20 fresh frozen plasma. She had 1 episode of convulsion there and had acute renal failure. She was then referred to our hospital as a case of PNC day 2 with postpartum eclampsia with acute renal failure for dialysis and further management. She developed complications of uremia, uremic encephalopathy with shock, peripheral circulatory failure and chronic renal failure and died on the same day within 9 hours.

Case 6 – She was a booked case at PHC with 5 antenatal visits. She was referred to our hospital as primigravida with antepartum eclampsia. She received Inj. Magnesium sulphate full loading dose at the referring hospital. She had 8 – 9 episodes of antepartum convulsions till she reached our hospital. On examination her general condition was poor, not responding, febrile, pulse rate 162/min, BP systolic 80 mm of Hg, pallor and edema present, icterus absent, reflexes were absent, respiratory rate was 18/min. Intracranial hemorrhage was suspected. She delivered spontaneously. Baby was fresh stillborn, liquor was thick meconium stained. She died on day 2 post delivery. Cause of death was coma with intracranial hemorrhage with peripheral circulatory failure with chronic renal failure.

Table 10 Correlation of type of eclampsia with maternal outcome.

Type of Eclampsia			Maternal outcome	
	Number	%	Alive	Dead
Antepartum	34	72.91	30	4
Intrapartum	1	2.71	1	0
Postpartum	11	23.91	9	2

On considering the type of convulsion, it was found that majority presented with antepartum convulsions, 72.91% had convulsions antepartum, 23.91% had convulsions postpartum whereas only 1 case i.e. 2.17% had Intrapartum convulsions.

During our study, it was found that, of the total patients presenting with antepartum eclampsia, 8.69% (4 cases) did not survive. Out of those who had postpartum eclampsia, 4.34% (2 cases) did not survive.

Table 11 Distribution according to number of convulsions correlated to maternal outcome

Number of convulsions			Maternal outcome	
	No. of patients	%	Alive	Dead
1 – 2 episodes	28	60.87	27	1
3 – 12 episodes	18	39.13	13	5

The above table reveals that majority of the patients presented with 1 or 2 episodes of convulsions i.e. 60.87%. 18 patients presented with 3 to 12 episodes of convulsions i.e. 39.13%. Status eclampticus was seen in 1 patient.

Our study revealed that the incidence of maternal mortality was more in patients with more than 3 episodes of convulsions with 5 of the 18 patients dying. Thus, as the number of convulsions increases, adverse maternal outcome increases.

Proportion of alive to dead in these two categories were found to be highly significant after applying z – test and ***p value=0.0087*** was calculated.

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Perinatal outcome	Booked	Unbooked
Live (FT)	13	8
IUD-Fresh	3	8
IUD-Macerated	1	3
Preterm (live)	7	4
Low birth weight (FT+L)	2	5
IUGR	0	5

RDS	0	3
Sepsis	0	0
NICU admission	9	9
Mortality	0	3
Anamolous	0	1

*multiple responses allowed.

There were 48 births included in our study out of which there were 3 pairs of twins and 1 patient remained undelivered. The common cause for perinatal mortality was preterm birth, birth asphyxia and respiratory distress.

A higher incidence of adverse perinatal outcome was seen in unbooked patients than the booked patients. This signifies that, booking status and antenatal care received play a vital role in preventing adverse perinatal outcome.

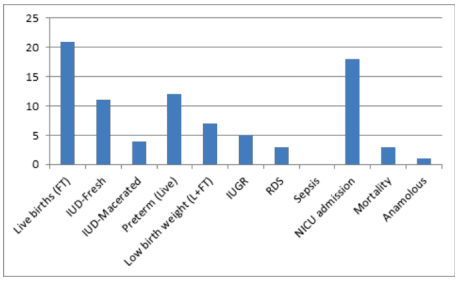

Figure 5. Perinatal outcome.

Table 13 Correlation of maternal and perinatal outcome with type and number of convulsions.

Type of convulsion	Number of convulsions	Maternal outcome		Perinatal outcome	
		Morbidity	Mortality	Morbidity	Mortality
Antepartum	Less than 3	8	0	2	8
	Greater than 3	8	4	4	9
Intrapartum	Less than 3	0	0	1	0
	Greater than 3	0	0	0	0
Postpartum	Less than 3	1	1	2	0
	Greater than 3	1	1	1	1

This table shows that overall the maternal and perinatal outcome in terms of morbidity and mortality was unfavourable when the number of convulsions were more than 3 regardless of the type of convulsion.

Table 14 Correlation of maternal and perinatal outcome with Booking status of woman.

Booking status	Maternal outcome		Perinatal outcome	
	Morbidity	Mortality	Morbidity	Mortality
Booked	5	2	6	4
Unbooked	13	4	10	14

The above table shows that maternal and perinatal morbidity as well as mortality was more among the unbooked cases.

DISCUSSION

Pregnancies complicated by eclampsia are characterized by functional derangement of multiple organ systems such as the cardiovascular, renal, hepatic, hematologic and central nervous system. In addition these pregnancies are associated with multiple complications including abruptio placenta, foetal death, disseminated intravascular coagulation (DIC), HELLP syndrome, pulmonary edema, sepsis and postpartum haemorrhage that require massive transfusion. Consequently above changes predispose such patients to an increased risk of acute renal failure.

A study entitled "RISK FACTORS FOR ADVERSE PREGNANCY OUTCOME IN ECLAPMSIA IN TERTIARY CARE CENTRE" was carried out in the department of obstetrics and gynecology at a tertiary care centre in a metropolitan city.

The present study was conducted in order to assess the incidence, risk factors, pregnancy outcome and factors for adverse pregnancy outcomes in patients of eclampsia .During the period of two months from 11th June to 12th August, a total of 1810 deliveries took place in our hospital. Out of these, there were 46 cases of eclampsia. Of these, 40 cases of eclampsia delivered in our hospital, there were 3 outside deliveries and 2 home deliveries and one patient died undelivered. Thus, the incidence of eclampsia in our hospital was 2.54% during the study period. Miguil et al found this incidence to be 0.91%. B.Shaheen and others found the incidence to be 1.65% in their study. The study carried out by Sunita T.H. and Rathnamala Desai in Karnataka gave an incidence of 0.7%. The incidence of eclampsia is much lower in developed countries like the United Kingdom (0.05%), than developing countries, probably because of better educational status, socioeconomic status and better health facilities. The incidence rate was found higher in our study as our hospital is a tertiary care centre and patients from other government hospitals and local clinics are referred to our hospital, similarly, the incidence of eclampsia in Eastern India as quoted by S. Singh and A.K. Behera was 3.2%, and it is 3.05% as given by Rowshan et al, both of which were higher than that found in our study as these hospitals are also tertiary care centres for a significantly larger area.

In our study, it was found that, majority of the patients were in the age group of 21 – 25 years i.e. 71.73%. Manjusha et al found that the incidence of eclampsia was 69.56% in the age group of 20 – 25 yrs. Shaheen et al in their study found that 63% of eclamptics were below 25 yrs of age with mean age being 24 years. Khanum, Ashraf and Sahreen also concluded that incidence of eclampsia was greater in patients below 25years of age. Rowshan and others also found that of the 416 patients of eclampsia in their study, 77% were in the age group of 20 – 25 years. The findings of the present study are in concordance with those of the above studies. The reason behind this high value of incidence could be early age of marriage, early conception and lack of knowledge of contraception. Ignorance as well as the lack of awareness about the availability of antenatal check-up due to illiteracy may have contributed to this high incidence in young age group.

It is a proven fact that eclampsia is more common in primigravida than multigravida. In the present study it was found that out of 46 cases 60.86% were primigravida, and 39.13% were multigravida. Khanum and et al in their study found that out of 100 cases of eclampsia, 58 cases were primigravida and 42 were multigravida. Manjusha and others also concluded that incidence of eclampsia was higher among primigravidas. In the study by Rowshan and others, 72.5% of the 416 patients were primigravidas. The findings of the above studies are comparable to those of the present study. The increase in incidence of eclampsia in primigravidas is due to the increased sensitivity on part of the women to trophoblastic tissue. Due to abnormalities in the development of placental vasculature early in pregnancy relative placental hypoperfusion may occur, which then leads to release of antiangiogenic factors into the maternal circulation that alter maternal systemic endothelial function and cause hypertension, preeclampsia and if undetected may even cause eclampsia.

Educational status i.e. the literacy level and the socio economic status are indirect determinants of the severity of the maternal hypertensive disorder. Only when the mother is educated does she understand the importance of prenatal medical care which when availed can considerably decrease the severity of the complications of preeclampsia and reduce the incidence of eclampsia. In the present study we could correlate the higher incidence of eclampsia with lower literacy level. We found that incidence of eclampsia decreased as the literacy level of the mother increased. The study done by B.Shaheen, L.Hassan, M.Obaid found that majority of the patients were illiterate (94.4%), giving a finding complementary to that of the present study. Rowshan et al, in their study found that 49% of the patients were illiterate, 72% belonged to low socioeconomic conditions and 76% were from rural areas. Low socioeconomic status is associated with poor nutrition which results in altered lipid metabolism leading to alteration in oxidative stress, arginine levels, NO levels and alteration in thromboxane A2/ prostaglandin levels which are responsible for PIH.

In our study it was found that 72.91% of cases presented with antepartum eclampsia, 23.91% had convulsions postpartum whereas only 1 case i.e. 2.17% had intrapartum convulsions. In the study conducted by Shaheen et al it was found that forty four (62%) patients developed seizures antepartum, 11 (15.5%) intrapartum and 16 (22.5%) postpartum. Sunita et al found that 56% of eclampsia were antepartum, 26% were intrapartum and 18% were postpartum. In the study by S.Singh and A.K. Behera antepartum eclampsia occurred in

21 (13.3%) patients; antepartum/intrapartum eclampsia in 108(68.3%) and postpartum eclampsia occurred in 29 patients (18.4%). These findings suggest that antepartum eclampsia is most common, which is, also the case in the present study.

The incidence of eclampsia, in the present study, was found to be higher in unbooked cases with 25 patients out of 46 being unbooked. Majority of these patients reported at our hospital with eclampsia or with one or more complications associated with eclampsia. The study done by S. Singh and A.K.Behera found that incidence of eclampsia was seen in 158 patients out of which, 154 were unbooked cases. Miguil et al in their study found that 82% of the cases received no antenatal care of any sort. Sunita et al found that 95% of patients of eclampsia in their hospital were not booked with them. 45% of patients had no antenatal care and around 55% of patients had some sort of antenatal care. Lack of antenatal care is one of the important risk factors for the development of eclampsia which is proven by many studies. Ante natal care is an important tool for early detection of women with PIH with various predictors and its timely treatment can prevent a woman from getting an eclamptic fit. So we need to stress the need of early booking through health education programmes, proper antenatal surveillance, early detection of women with warning signs and symptoms, prompt referral to tertiary care centre and hospitalization since domiciliary treatment has no role in woman diagnosed with PIH.

Eden's prognostic criteria for eclampsia, states that, there is a direct relation between the number of convulsions and the prognosis. As the number of convulsions increases, the prognosis becomes worse. In the present study, we found that when the number of convulsions and maternal outcome (alive or dead) was correlated, the proportion was found to be highly significant with *p value = 0.0087*. This proved that, the incidence of maternal mortality increased as the number of episodes of convulsion increased, due to aspiration pneumonia, intracranial hemorrhage, heart failure etc, which is in concurrence with Eden's criteria. In our study, it was found that 28 patients had 1 – 2 episodes of convulsions of which only 1 died, whereas 18 patients had 3 – 12 episodes of convulsions of which 5 patients died. Sunita and others found that maternal deaths increased when patient presented with more than 5 episodes of convulsions. S.Singh and Behera found that 125/158(79.1%) patients had between 3-10 episodes of convulsions while 9(5.7%) patients had 11or more episodes of convulsions before start of anticonvulsant therapy. Thus, the conclusions of the present study and the above studies are analogous.
The overall maternal mortality rate in our study was 13.04%. Of the 46 patients of eclampsia admitted in our hospital during the study period, 6 died. The case fatality rate was 16.9% in the study conducted by Shaheen and others. Singh and et al encountered 7 maternal deaths in their study population of 158. Miguel encountered a maternal mortality rate of 6.7%. Our case fatality rate was found to be higher than most as ours is a tertiary care centre. The most common complication in the present study was acute respiratory failure followed by disseminated intravascular coagulation and PPH. When the number of women developing complications and the booking status of the women was compared, the difference of proportion was found to be significant with a *p value of 0.026*. Marina Khanum et al found that complications such as pulmonary oedema was seen in 16%, PPH in 21%, wound infection in 6% and death in 2%. M.E. Sak et al found that HELLP syndrome was associated with 74 (44.3%) patients out of the study population of 167. Nine patients died. Intracranial bleeding was seen in 3 patients, and HELLP syndrome in 5; hepatic rupture in 1; sepsis in 2, renal failure secondary to DIC in 1 and cerebral bleeding was seen in 1 patient. In the study conducted by S.Singh and A.K. Behera, pulmonary edema accounted for majority of the deaths. Out of 158, 42 patients developed various complications. Shaheen and others in their study found that 35% of the patients had one or more major complications of eclampsia (pulmonary edema, cerebro-vascular accident, cardiovascular problems, disseminated intravascular coagulation (DIC), respiratory distress and retinal detachment). Twelve out of 71 patients died showing case fatality rate of 16.9%.In the current study, ARF was found to be the most common complication. It may have developed due to vasospasm that occurs in preeclampsia or eclampsia, which causes hypoperfusion of the renal tissue, leading to oliguria and damage to the kidney.

In the present study, a total of 48 deliveries occurred. There were 3 pairs of twins and one patient was undelivered. There were 15 cases of intrauterine deaths of which 4 were IUD macerated and rest 11 were fresh stillborn. 10 babies were born preterm live and there were 5 cases of intra uterine growth restriction. There were in total 18 NICU admissions and 3 cases of respiratory distress syndrome and 3 of neonatal deaths. One baby was born anomalous. It was found that incidence of stillbirth/intrauterine death was more among the unbooked cases than the booked ones. In the study conducted by Singh and Behera, it was found that there were a total of 50 still births and 5 neonatal deaths out of total of 167 deliveries in the 158 women with eclampsia. Khanum et al had a perinatal mortality rate of 27% in the vaginally delivered group and 7% in those delivered by LSCS. Shaheen and others concluded that out of total 77 births in, 24 (31.17%) were stillbirths, 8 (10.39%) early neonatal deaths and 45 (58.44%) were alive by the end of one week. Thus, perinatal outcome depended largely on the quality of antenatal care received, thus emphasizing the importance of antenatal checkups.

Our study concluded that the mode of delivery was vaginal in 28 cases of which 12 cases delivered spontaneously and 16 cases were induced. There were 3 outside deliveries and 2 home deliveries which were included in the spontaneous vaginal delivery group. One woman died undelivered. It was found that, of the 28 cases that delivered vaginally mortality rate was 14.28% i.e. 4 cases. Among those who underwent LSCS, 5.55% died, when p value was calculated using z – test (*p – value 0.187*), it was found to be insignificant. Marina Khanum and others reported that, of the 100 cases in their study, 71% were normal vaginal delivery and 25% were LSCS and the rest were craniotomy and forceps delivery. Shaheen et al in their study found that out of the total 47 antenatal patients in their study c/ section was the mode of delivery in 4 patients (8.7%), 14 (30.43%) had instrumental delivery and 28 (60.86%) had non-instrumental deliveries. One patient died before delivery. The present study shows that there is no correlation between the mode of delivery and maternal outcome whatsoever.

CONCLUSION

The maximum incidence of eclampsia was seen in age group 21 – 25 yr, with a higher incidence in primigravidas. The frequency of eclampsia was found to be more in women coming from low financial background and those with education less than 12th standard.

The correlation between the booking status and maternal outcome in terms of mortality and morbidity was found to be statistically significant when z – test was used with *p value = 0.026*. This helps us conclude that the leading reason for women developing eclampsia and related complications could be due to lack of adequate antenatal care. The reason for this could be due to lack of awareness of importance of antenatal care or difficulty in timely access to proper health care facilities.

The women who had received antenatal care developed fewer complications related to eclampsia like acute renal failure, HELLP syndrome and intracranial hemorrhage. These patients also had a better perinatal outcome with fewer cases of stillbirth and neonatal mortality. These findings point out that the type of antenatal care received by the women played an important part in reducing not only the mortality but also the burden of morbidity in both the mothers as well as the babies.

The maternal outcome was largely influenced by the number of convulsions which the woman had. The adverse maternal outcome increased significantly as the number of convulsions increased, with maternal mortality high among women suffering from more than 3 episodes of convulsion. **When z – test was used, the proportion of alive and dead to the number of convulsions was found to be statistically significant with *p value = 0.0087*.**

Timely recognition of preeclampsia appears to play a key role in prevention of eclampsia. Frequent visits result in prompt identification of preeclampsia & effective management of the condition. Early diagnosis & management to prevent progression of preeclampsia would prevent eclampsia and significantly ameliorate the outcome for both the mother and the fetus. Therefore, emphasis on the importance of regular antenatal checkups not only amongst the women but also their relatives and prompt shifting to a tertiary care centre will help reduce the various complications associated with eclampsia and lead to better outcome both maternal as well as perinatal.

Therefore, early detection, appropriate primary treatment and timely referral remain the pillars for effective management to minimize the morbidity and mortality of eclamptic patients.

SUMMARY

This study was carried out to determine the pregnancy outcome in eclampsia and to assess factors which lead to adverse pregnancy outcome in eclampsia.

A prospective study was conducted over a period of 2 months at a tertiary care centre in a metropolitan city. The study population included all the cases of eclampsia (antepartum, intrapartum and postpartum) admitted in our hospital during the study period. Complete sociodemographic and clinical data along with the results of investigations was collected from each patient via a questionnaire. Consent was obtained from all the patients/relatives.

The present study found that eclampsia was more common in the age group of 21 – 25 years of age (71.73%) and amongst primigravida (60.87%). The incidence was more in the women that were from financially low families and those educated below 12th standard. It was found that the preponderance of eclampsia was higher in unbooked cases (54.35%) than in booked cases (45.55%). In the present study, correlation between the mode of delivery and maternal outcome was not proved as of the 28 vaginal deliveries, 14.28% died (4cases) and of the 18 cases that underwent LSCS, 5.55% died. Of the 46 cases of eclampsia, 6 cases of maternal death occurred, giving an incidence of 13.04%. Acute renal failure was found to be the most common maternal complication followed by disseminated intravascular coagulation, post partum hemorrhage, cerebrovascular episode and HELLP syndrome. When the booking status of the patient and complications developed was correlated, it was found that incidence of complications developed was more in unbooked category as compared to booked category. This was found to be statistically significant (using z – test) ***p value = 0.026***. The frequency of antepartum convulsions (72.91%) was more that intrapartum convulsions (2.17%) and postpartum convulsions (23.91%). Our study revealed that incidence of maternal mortality increased as the number of convulsions increased. When z – test was applied, ***p value = 0.0087*** was obtained, proving the finding to be statistically significant. A higher incidence of adverse perinatal outcome was seen in unbooked patients than the booked patients.

SUGGESTIONS

Women should be made aware of the importance of antenatal visits through educational and mass awareness programmes.

Magnesium sulphate remains the most effective, low cost drug to prevent/treat eclampsia. The health workers should be trained to administer magnesium sulphate and educated regarding the drug and its use. It should be made available in the primary health centers as opposed to only high end health facilities.

All health professional (including ASHA workers, nurses and midwives, medical officers) should be appropriately trained to detect the various signs and symptoms associated with pre-eclampsia and eclampsia, provide treatment and refer to a tertiary care centre in a timely manner.

In interior areas, health workers should regularly conduct home visits to detect and counsel pregnant women and motivate them to visit nearby hospital/health centre for further management.

All cases of pre-eclampsia must be referred to tertiary health centers before they progress to eclampsia. With such a policy, majority of the cases of eclampsia can be prevented with timely intervention leading to a reduction in the mortality and morbidity of both the mother and baby.

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