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ECLAMPSIA, A MAJOR CAUSE OF MATERNAL & PERINATAL MORBIDITY AND MORTALITY

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ABSTRACT ... tayyibawasim@yahoo.com Eclampsia is a serious obstetric complication, particularly in developing countries. **Objectives:** The objective of our study was to highlight the high incidence of eclampsia at our institution and to determine the maternal and perinatal morbidity and mortality associated with it. **Setting:** Lahore General Hospital, Lahore, **Period:** January, 2001 to December, 2002. **Patients and Methods:** 136 eclamptic patients among a total of 6173 deliveries during this two year period. **Results:** The incidence of eclampsia at our institution was 22 per 1000 deliveries or 2.2%. Most of the patients were less than 21 years old (51.4%) and were primigravida (59.6%).The majority of patients were uneducated (85%) and belonged to the lower socioeconomic class (90%). 94% were unbooked and only 6% were booked. Most of the patients presented with antepartum eclampsia (63.2%) and were at 28 to 36 weeks of gestation (50%). 15% were at less than 28 weeks of gestation, while 35% were at more than 36 weeks of gestation. The commonest mode of delivery in eclamptics was spontaneous vaginal delivery (71.6%) followed by lower segment caesarean section in 18.7% and forceps delivery in 9.7%. The mean hospital stay was 8 days. The maternal complications were septicemia (69.85%), pulmonary complications (66.18%), urinary tract infection (41.18%) and cerebrovascular accidents (11.03%). HELLP syndrome occurred in 2.94 %. There were 11 maternal deaths, the case fatality rate being 8%. The maternal mortality rate among eclamptics was 89.5 per 100,000 live births. The commonest cause of maternal mortality in our series was cerebrovascular accident (54.55%). Other causes of maternal mortality were pulmonary complications (27.27%) and renal failure (18.18%). The perinatal mortality rate was 47.77% including 31 stillborns (47.7% of perinatal deaths) and 34 early neonatal deaths (52.3 % of perinatal deaths). The early neonatal mortality rate was 32.38%. The causes of perinatal mortality were prematurity (30.77%), birth asphyxia (33.85%), meconium aspiration syndrome (18.46%) and intrauterine growth retardation (15.38%). **Conclusion:** The incidence of eclampsia is very high. The case fatality rate in our series is lower than most developing countries. Eclampsia is associated with significant maternal morbidity and perinatal mortality. The major avoidable contributing factor is lack of antenatal care. Hence, improvement in antenatal care services is required to reduce the incidence of eclampsia as well as the morbidity and mortality associated with it.

INTRODUCTION

Eclampsia is a serious obstetric complication with a

significant maternal and fetal morbidity and mortality. It is defined as the new onset of convulsions, unrelated to cerebral pathological conditions, in pregnancy or postpartum, in combination with hypertension[1].

Eclampsia is a rarity in the prosperous West, the incidence being 4.3/10000 in the United States [1,2] and 4.9/10000 in England[1]. However, the incidence is much higher in the developing countries. The incidence reported in a study conducted in Nigeria is 42/10000[3]. Another source from South Africa reports an incidence of 36/10000[4]. A study carried out in India shows an incidence as high as 220/10000[5]. A report from Peshawar, Pakistan, states an incidence of 120/10000 [6]. Additionally, developing countries have maternal mortality rates 100 to 200 times higher than Europe and North America[7]. It is estimated that 10% of all maternal deaths in the developing world are associated with Eclampsia[7]. Hence, eclampsia still complicates a substantial number of pregnancies in the Third World countries and is a significant cause of obstetric morbidity and mortality.

AIMS & OBJECTIVES

To highlight the high incidence of eclampsia at our institution and to determine the maternal and perinatal morbidity and mortality associated with it.

PATIENTS & METHODS

This study was conducted from January, 2001 to December, 2002 at Lahore General Hospital, Lahore. All patients with eclampsia who were treated in the Department of Obstetrics and Gynaecology at our hospital during this two year period were included in the study. We excluded all patients who left against medical advice before completing treatment at our institution. Our sample size consisted of 136 patients.

All patients with eclampsia were managed according to the following guidelines: treat convulsions immediately, control blood pressure, stabilize mother and deliver fetus as soon as mother is stable, irrespective of gestational age. All patients underwent a physical examination, a neurological evaluation and routine laboratory tests. Convulsions were controlled with intravenous diazepam, which was continued till 24 hours after delivery or till 24 hours after the last convulsion in case of postpartum eclampsia. 5% dextrose in Ringer Lactate's solution was administered at a rate of 100-150ml/ hour as routine fluid replacement therapy.

Blood pressure was controlled, in cases with diastolic pressure higher than 100 mm Hg, with methyldopa or nifedipine. Triple regime antibiotics (Ampicillin, Gentamicin, and Metronidazole) were routinely administered. A single dose of intravenous mannitol was administered postpartum and then, oral Moduretic was continued till the blood pressure control was achieved. Vital functions, fluid intake, urine output and reflexes were closely monitored.

A specially designed proforma was used to record data. This proforma took into account the demographic variables such as age, socioeconomic and literacy status as well as the parity, gestational age at presentation, time of onset of eclampsia, mode of delivery and maternal and perinatal outcome. Data was analyzed using SPSS version 11.0 software. Continuous variables were analyzed using the student's t-test while categorical variables were analyzed using the chi-square test. The level of significance was taken as p value< 0.05.

RESULTS

The total number of deliveries at Lahore General Hospital from January, 2001 to December, 2002 was 6173. Out of these, 136 were diagnosed and treated with eclampsia. The incidence of eclampsia was 22 per 1000 deliveries or 2.2% of the total deliveries.

Most of the patients who presented at our hospital with eclampsia were unbooked (94.1%) and had received inadequate or no antenatal care. Only 5.9% were booked

Out of 136 eclamptic patients, 51.4% were less than 21 years old, 36 (26.4%) were 21 to 30 years old and 30(22%) were 31 to 42 years old. (Fig 1). 90% of the

patients belonged to the lower socioeconomic class and 10% belonged to the middle class. Most women (85%) were uneducated, while 10% had received primary education.

Most of the eclamptic patients were primigravida (59.6%). 31 patients (22.8%) were gravida 2 to 5 and 24 patients (17.6%) were gravida 6 or more. (Table I)

Table I Parity of Eclamptic Patients (N=136)

Parity	No. of Pts	%age
Primigravida	81	59.6%
Gravida 2 to 5	31	22.8%
Gravida 6 and above	24	17.6%

Out of 136 patients, 18 (15%) were at less than 28 weeks of gestation at presentation, 58(50%) presented at 28 to 36 weeks of gestation and 42(35%) presented after 36 weeks of gestation. Hence, most eclamptic patients were between 28 and 36 weeks of gestation at presentation (Fig 2).

86 patients (63.2%) presented with antepartum eclampsia. 33 patients (24.2%) presented with intrapartum and 17 (12.6%) with postpartum eclampsia. (Fig 3).

Spontaneous vaginal delivery was the commonest mode of delivery (71.6%). Forceps delivery was performed in 13 patients (9.7%) and caesarean section was performed in 25 (18.7%) patients. 1 patient died undelivered.

The mean hospital stay was 8 days (Range 3-11 days). 122 patients developed fever (89.7%). 56 (41.18%) had urinary tract infection. Most of these patients had septicemia (69.85%). Pulmonary complications were seen in 90 patients (66.18%). These included aspiration pneumonia, pulmonary edema and adult respiratory distress syndrome. Cerebrovascular accidents occurred in 15 patients (11.03%). HELLP (hemolysis, elevated liver enzymes and low platelets) syndrome developed in 4 patients (2.94%). Prolonged anti hypertensive therapy was required in 116 patients (85.3%). (Table II)

Table II Causes of Maternal Morbidity

Morbidity	No of pts	%age
Fever	122	89.71
Pulmonary Complications	90	66.18
Urinary Tract Infections	56	41.18
Cerebrovascular Accidents	15	11.03
Help Syndrome	4	2.94
Prolonged Anti Hypertensive Therapy (> 7 Days)	116	85.29

There were 11 maternal deaths (8%). The maternal mortality rate among eclamptic mothers was 89.5 per 100,000 live births. 6 out of 11 deaths (54.55%) were due to cerebrovascular accidents, the commonest cause of maternal deaths in our series. 3 deaths (22.27%) were due to pulmonary complications and 2 deaths (18.18%) were due to renal failure. All these 11 patients were septicemic at admission. (Table III)

Table III Causes of Maternal Mortality, (n=11)

Cause of death	No of Pts	%age
Cerebrovascular Accidents	6	54.55
Pulmonary Complications	3	27.27
Renal Failure	2	18.18

The total number of births in our series was 142, which included 128 singleton births and 7 sets of twins. There were 65 perinatal deaths, the perinatal mortality rate being 47.77%. There were 31 still births (47.7% of the perinatal deaths) and 34 early neonatal deaths (52.3% of the perinatal deaths). The early neonatal mortality rate was 32.38%.

Prematurity contributed to 20 out of 65 perinatal deaths (30.77%). Birth asphyxia was the cause of 22 perinatal deaths (33.85%). Meconium aspiration syndrome led to 12 perinatal fatalities (18.46%). Intrauterine growth retardation was the cause of

death in 10 cases (15.38%). (Table IV)

Table IV Causes of Perinatal Deaths

Cause of death	No. of Pts	%age
Birth Asphyxia	22	34.38
Prematurity	20	31.25
Meconium Aspiration Syndrome	12	18.75
Intrauterine Growth Retardation	10	15.62

DISCUSSION

Eclampsia is a significant cause of maternal and perinatal morbidity and mortality, particularly in developing countries, where the incidence is still high. It is reported to affect 0.015% to 0.05% of the pregnant women in the West[8], compared to an incidence of 2.2% in our series. The incidence reported by an author from India (2.2%)[5] is similar to our figure, whereas the incidence reported in studies from Africa (0.36% to 0.42%)[3,4] is significantly higher than the West, but still lower than the figure we have reported. The incidence of eclampsia at our institution is in fact higher than that reported by authors from most other institutions in the country. Malik has reported an incidence of 1% at Lady Wellington Hospital, Lahore, in 1998[9].

Shaheen et al from Peshawar reported an incidence of 1.2% in 2003[6]. This high incidence we report reflects our failure to prevent eclamptic convulsions in a substantial number of pregnant women. Sibai et al reported that the causes responsible for the failure to prevent eclamptic convulsions are physician error, patient failures and abrupt or late onset of eclampsia[10]. In most of our cases, patient failures contributed to the development of eclampsia. Most patients were unbooked (94%) and had received inadequate or no antenatal care. Some of the factors leading to the lack of antenatal care include lack of health care facilities in rural areas, ignorance, religious customs and preference for home deliveries attended by midwives.

Physician errors may also contribute to the failure to prevent eclampsia, probably because eclampsia is still perceived as the end of a linear spectrum that extends from gestational hypertension through pre eclampsia and finally eclampsia. However, some authors have reported that eclamptic seizures are not always preceded by the common signs of pre eclampsia[7]. Furthermore, hypertension and proteinuria are not necessarily the most important signs of pre eclampsia[7]. Hence, physicians must have a high index of suspicion, especially when managing patients with one or more risk factors for developing pre eclampsia and eclampsia.

The age distribution of patients in our series is similar to other reports and suggests that eclampsia is probably a disease of young women[5,7,11]. Most of our eclamptic patients were less than 21 years old (51.4%). Also, the primigravida were more likely to develop eclampsia compared to the multigravida (p value < 0.05; RR= 1.45). The available literature does not provide an obvious cause for this observation.

However, one possible explanation for this association may be that a large number of these young eclamptic patients report a lack or absence of antenatal care and they have not been screened for previous underlying diseases such as chronic hypertension or diabetes mellitus which are well known risk factors for the development of pre eclampsia and eclampsia.

Our results reveal that the majority of our cases presented with antepartum eclampsia (63%). This is in accordance with the results of most other studies[7,11,12]. Our analysis shows that antepartum eclampsia is strongly related to preterm eclampsia (p value< 0.01) and hence it is also associated with a greater frequency of perinatal complications (p value< 0.05), since smaller gestational age at delivery correlates with a worse perinatal outcome[6].

Previous reports suggest that eclampsia is more severe when it develops antepartum and is associated with a higher maternal mortality[7,12,13]. The majority of maternal deaths in our series occurred in the

antepartum eclampsia group (82%). However, the maternal complication rate was not significantly different in the antepartum and postpartum groups.

The most common causes of maternal morbidity in our series were pulmonary complications (66.18 %) and septicemia (69.85%), which often manifested with fever and urinary tract infection (41.18%). Pulmonary complications included aspiration pneumonia, pulmonary edema and acute respiratory distress syndrome. 89.7% of the eclamptics in our series developed at least one complication. Most of these women (65%) had presented at least 6 hours after the onset of the first eclamptic convulsion, hence predisposing them to develop eclamptic complications, due to delay in the initiation of treatment. Most of these women were from rural areas where expert medical help was not available and quick transportation was not accessible.

Neurological complications were the most serious of all eclamptic complications and were the commonest cause of maternal mortality in our series (54.5%). Neurological complications of eclampsia range from transient neurological deficits such as transient cortical blindness, aphasia, limb weakness, paralysis, and psychosis to cerebrovascular accidents with permanent sequelae and coma. The events leading to neurological complications may be explained by the disruption of cerebral capillary integrity that can occur with mean arterial pressure $\geq$ 140 mmHg, leading to increased intra cranial pressure and ischemia[14]. Hypertension may also lead to an increase in the permeability of brain capillary endothelial cells and loss of cerebral auto regulation[14]. Cerebral hemorrhage commonly leads to death in eclampsia, unless managed timely and appropriately. It has been shown that blood pressure levels in pre eclamptics and eclamptics are labile and extremely sensitive to antihypertensive agents[14,15]. Use of rapid acting antihypertensives may lead to sudden fall in blood pressure and cardiac arrest[14]. Hence, timely but gradual lowering of blood pressure is essential to reduce morbidity and mortality in eclampsia. The case fatality rate in eclamptic patients in our series was found to be 8%. A similar study conducted earlier at Lady Wellington Hospital, Lahore, reported a figure of 12.1% in 1978 and 6.1% in 1998[9]. Jamelle from Karachi reported a figure of 8% in 1997[2], which is the same as the case fatality rate reported in our present analysis.

Our analysis also shows that our case fatality rate is lower than many other developing countries. An author from Nigeria has reported a figure of 11.6%[3], while another report from South Africa has shown a case fatality rate of 21.2%[4]. A study conducted in India in 1993 reported a figure of 29.5%[5]. However, in spite of being lower than the figures reported from most developing countries, our case fatality rate is still higher than that observed in the West, where it is estimated to be 1 to 6%[7,16]. Our maternal mortality rate of 89.5 Per 100, 000 live births, among eclamptic mothers, is also higher than the figures reported by most Western authors[7,16].

In spite of a reduction in the case fatality rate documented in Pakistani literature over the years, the perinatal mortality associated with eclampsia does not seem to show any decrease. A study conducted at Lady Wellington Hospital, Lahore, showed a perinatal mortality of 43.3% for babies of eclamptic mothers, in 1978, and 40% in 1998[9]. Our present analysis has revealed a perinatal mortality of 47.77%. This figure is similar to that reported recently in a study conducted in Peshawar, Pakistan[6]. Similar figures have been shown by reports from other developing countries like India (40% perinatal mortality rate in 1995)[17] and Nigeria (44.4% perinatal mortality rate in 2001)[3].

Birth asphyxia was the commonest cause of perinatal mortality in our study, accounting for 35% or perinatal deaths. Prematurity was the major risk factor associated with perinatal mortality and was documented in 31% of the perinatal fatalities. Most perinatal deaths (75%) occurred in fetuses or neonates of mothers with antepartum eclampsia, as reported earlier by several authorities[7,12]. Also, there was a high number of stillbirths on admission (47.7%), mostly in mothers who had not received regular antenatal care. Hence, we believe that

advances in antenatal and neonatal care, electronic fetal monitoring and appropriate timing of delivery in eclamptics will be effective in increasing perinatal survival rates for infants born to these mothers.

CONCLUSIONS

Eclampsia remains a continuing problem in developing counties. The incidence of eclampsia at our institution is one of the highest in the world. Despite this high incidence, the case fatality rate is lower than most other developing countries. However, the perinatal mortality associated with eclampsia is very high. The major avoidable contributing factor is lack or absence of antenatal care. Hence, an improvement in the antenatal care and neonatal care services will be effective in reducing the incidence of eclampsia, as well as the morbidity and mortality associated with it.

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