Original Article

Maternal and Neonatal Outcome of Eclampsia in WHO Multi Country Survey on Maternal and Newborn Health

Sadia Aftab[1], Syeda Batool Mazhar [2], Arfa Tabassum [3], Shireen Zulfiqar Bhutta [4], Arif Tajjamul [5]

[1]Medical Officer, MCH Centre Unit1, PIMS, Islamabad, [2]Professor & Head of Department MCH Centre PIMS, Islamabad, [3]Assistant Professor, MCH Centre Unit 1, PIMS, Islamabad, [4]Professor of Obs/Gynae, JPMC Karachi, [5]Professor of Obs/Gynae, Jinnah Hospital Lahore

Correspondence: Dr. Sadia Aftab, Medical officer, MCH Centre Unit 1. PIMS, Islamabad.
E-mail: aftabsadia@ymail.com

Abstract

Objective: to determine demographic factors, maternal and perinatal outcome of eclamptic women in health care facilities across Pakistan participating in WHO Multi country survey.

Design: a cross-sectional study

Setting: this cross-sectional study was conducted in 16 health care facilities across Pakistan in federal capital, provinces Punjab and Sind.

Study Duration: from 1st March to 30th May 2011.

Methodology: hospital records were obtained to collect data of women who delivered in the studied facilities or admitted within 7 days of delivery or abortion and data of women who developed eclampsia was retrieved for this study. Data was entered and analyzed in SPSS using chi-square and logistic regression models. The main outcome measures were demographic factors and maternal and neonatal outcome in women with eclampsia.

Results: overall 13175 women delivered within the period, out of which 56 had eclampsia with an incidence of 4.2 per thousand deliveries. There were 3 maternal deaths, with a case fatality rate of 5.3 %. Eclampsia was commonest in age group of 20 – 40 years (91 %). Primigravidas constituted 58.9 % (33) of cases. Illiteracy was found in 55.4 % of cases. Majority of the women were delivered preterm at < 37 weeks of gestation 71.4 %.(40). Ceasarean section (CS) was the most common (66.1 %) mode of delivery and prophylactic antibiotics were used in 82.1 % women. Ante partum and intrapartum eclampsia was more commonly seen (98.2 %) than postpartum eclampsia. Fifty three women (94.6 %)

Authorship Contribution: [1] Conceived the idea, literature review, authored the study. [2]Reviewed the study, helped in data analysis, [3] Reviewed the study, [4,5] Rest of authors conceived the idea and conceptualized the design of multicountry survey, randomization of patients and data collection.

received magnesium sulphate. Among the Neonates there were 73.21% (41) low birth weight (LBW) babies. Perinatal mortalities were 24 % (14) and infants with APGAR Score ≤ 5 were 28.5%.

Conclusion: eclampsia is one of the major causes of maternal and neonatal morbidity and mortality. Maternal education, awareness and easy access to health care facilities is of utmost importance. Sensitization of antenatal clients about danger signs of pre-eclampsia / eclampsia along with the emergency obstetric care services should be available at all health care facilities especially at grass root levels.

Key Words: Eclampsia, Primigravida, Perinatal mortality, Preterm, Health facilities.

Introduction

Hypertension affects 7-9% of all pregnancies.[1] Eclampsia is a major cause of maternal morbidity and mortality causing 50,000 maternal deaths worldwide annually.[2] Eclampsia complicates 1 in 2000 pregnancies in Europe to 1 in 3250 pregnancies in U.S.[3,4] In the developing world its incidence is reported as 1 in 100 to 1 in 1700 pregnancies.[5] The incidence is higher in developing countries like India, Nigeria Bangladesh where it ranges from 1.8 to 9%. However, the incidence in the developed world is reported to be as low as 0.1%. Incidence of eclampsia is around 0.5%-4% in Pakistan.[6]

Although the precise cause of progression from preeclampsia to eclampsia is yet to be known, it is well established that early detection and treatment through good antenatal care decreases the incidence of eclampsia and its complications. The aim of this study was to determine demographic factors and maternal and perinatal outcome among women with eclampsia delivering in various health care facilities across Pakistan participating in the WHO Multi country Survey

Methodology

Setting: Most of these were secondary or tertiary care health facilities located in urban or peri-urban areas. In each health facility, medical records of all eligible women were reviewed over two to three months according to the annual number of deliveries.

Sampling technique: Health facilities in the government sector were identified with the assistance of federal MNCH cell and then randomly selected through a stratified, multistage cluster sampling strategy. 16 health facilities were selected across Pakistan from Sindh and Punjab Province.

Study Duration: from 1st Mar 2011 to 31st May 2011.

Eligibility criteria of health facilities:

- The health facilities conducting ≥1,000 deliveries annually and had the capacity to provide caesarean section
- All women giving birth at participating facilities and those admitted within seven days of delivery or abortion with severe maternal morbidity or mortality as defined by WHO.

Operational Definitions

Eclampsia: It is defined as presence of new onset of tonic clonic seizures in women with preeclampsia.[7]

Methods: Data was collected on a daily basis using hospital records by trained data collectors at the time of discharge, transfer or death up to 7 days postpartum for both mother and baby on study Proforma. For each facility, the head of unit was designated as hospital coordinator and a doctor was deputed as data collector. The data collectors and coordinators were trained on data collection and recording in one day workshops conducted at Islamabad, Lahore and Karachi. A short pilot phase was implemented to test the entire data management process. All study proformas were dispatched to central collaborating office at MCH Centre, PIMS, Islamabad for web based entry. Intra-form validity cross-checks were performed in addition to random cross-checks comparing hospital records against recorded data.

Detailed information was collected regarding age, parity, booking status, maternal education, gestational age at delivery, use of anti-convulsants and mode of delivery. Maternal complications and perinatal outcome regarding live births, still births, LBW babies APGAR scores and NICU admissions were also sought.

Any inconsistencies in the data were reported back to the relevant hospital coordinators. Data was entered in SPSS 18 and analyzed using chi square tests and logistic regression models. This study was approved by the World Health Organization Ethical Review Committee and National Bioethics Committee, Pakistan Medical and Research Council. The country data for Pakistan was used for subgroup analysis in this study.

Results

Over all 13,175 women from 16 facilities were included in the study. In total 13,122 women delivered in the participating facilities.

For this subgroup analysis, women with eclampsia were 0.4% (56) with an incidence of 4.2 per 1000 deliveries. Maternal deaths from eclampsia were 3 with a case fatality rate of 5.3%. Eclampsia was most commonly found in maternal age group of 20-40 years (91%). Primigravida constituted the highest number of eclamptics 58.9% (33) as shown in Table I.

Table I. Parity Distribution

Parity	Frequency	Percentage
1	33	58.9%
2-5	19	33.9%
>5	4	7.1%
Total	56	100%

Poor maternal educational status of which illiteracy being most common (55.4%) is a major association for lack of seeking antenatal care and thus leading to many complications as mentioned in Figure 1.

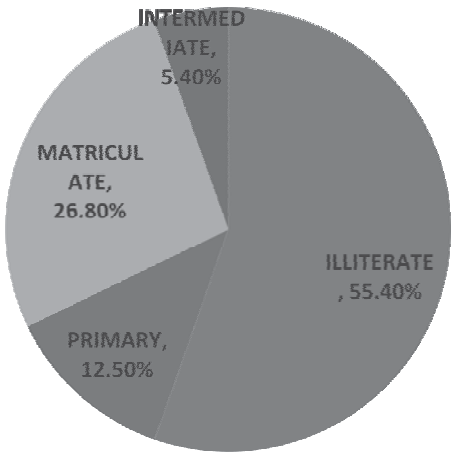

Figure 1. Education of women with eclmapsia

Most of patients (71.4%) delivered preterm hence lower Segment CS was the major mode of delivery

66.1%. Patients who delivered at or more than 37 weeks were (28.6% which is mentioned in Table II.

Table II. Gestational Age at Delivery

Gestational age(weeks)	Frequency	Percentage
<37	40	71.4%
≤37	16	28.6%
Total	56	100%

Women with eclampsia who became seriously sick and thus required ICU care were 32.1%. (18) Magnesium sulphate was drug of choice and was used in 94.6% cases while other anti-convulsants namely diazepam was used to control fits in 4 women.

Perinatal outcome showed that 75% (42) babies delivered alive. Fresh still births were 19.6% (11) and macerated still births were 3%. Neonates with LBW (<2.5kg) were 73.2% (41) while birth weight (>2.5kg) in 15 infants as shown in Table III.

Table III. Neonatal outcomes

Neontal Outcome	Frequency	Percentage
Alive	42	75%
Fresh still birth	11	19.6%
IUD	3	5.4%
Birth weight<2.5 Kg	41	73.2%
Birth weight>2.5 Kg	15	26.8%
NICU admission	23	54.8%

Babies with low APGAR score ≤ 5 were 28.5% (12) of which 54.8% babies were sick enough to need NICU admission.

Discussion

Preeclampsia and its complications are responsible for more than 63000 maternal deaths worldwide. Of these deaths, 98% occur in developing countries.[7] Eclampsia causes 12.9% of maternal mortality globally.[8] The incidence of eclampsia in the multicounty survey of Pakistan in 2011 was 4.2 per 1000 deliveries while in Nigeria incidence varies from 3 to 17 per 1000 deliveries.[2]

Hypertensive disorders of pregnancy were ranked third important cause (18.63%) of maternal mortality in a nationwide study in Pakistan, this was preceded by haemorrhage (24.49%) and sepsis (20.18%) retrospectively.[9] Another secondary analysis (unpublished) on Severe Maternal outcome from the WHO multicountry survey revealed that Postpartum haemorrhage accounted for severe maternal outcome in 64 of 48.9% (132) followed by hypertensive disorders in 29.7% (34) and ruptured uterus in 6.9% (9) of cases. Likewise PPH remained the major causative factor leading to maternal death in 18 (48.5%) women while, hypertensive disorders of pregnancy resulted in 7(18.4%) of maternal deaths. Eclampsia increases the risk of developing severe maternal outcome to 7 times as compared with control group reference.

Delays and limitations in the referral system result in a very high proportion of women presenting at the hospital in a severe health condition. Lack of health care facilities, inadequate training in initial resuscitation, late implementation of interventions and lack of intensive care services are the factors that may provide an explanation of a high maternal morbidity and mortality associated with eclampsia despite high rate of MgSO4 use.

The case fatality rate is one of the process indicators for United Nations that shows the quality of service with regards to saving women`s lives in that facility. The maximum recommendation is of 1% by United

Nations. In our study there were 3 maternal deaths leading to case fatality rate of 5.3% which is much higher than the recommendation There are many factors responsible for this including un-booked status of women when they arrive to the health facility, high parity, delayed hospitalization, lack of timely transportation, late referrals to tertiary care hospitals, the state of unconsciousness and multiple seizures prior to admission.[10] This strongly indicates that a lot of effort is required to save these women from dying.[2]

WHO analysis of risk factors of preeclampsia and eclampsia states that majority (59%) of mothers were between ages of 20-29 years.[11] According to study of Douglas and Redman eclampsia was not seen in teenage girls but more frequently in women in their twenties.[4] In our study the mean age was 30 years which is similar to WHO Secondary Analysis on eclampsia.[11]

Eclampsia is found to be a condition of young primigravida. In this study the incidence was 58.9% which is consistent with an Indian study (which showed an incidence of 61%) [12] and many other studies.[13]

In our study, ante partum and intrapartum eclampsia constituted the main bulk 98.2%(55) and only 1 case of postpartum eclampsia was seen. Similar findings were seen in the Indian study which reported antepartum eclampsia as 52.5% and postpartum eclampsia 16.5%.[12] This is different from developed world where postpartum eclampsia is common (11-44%). The possible reasons could be, improved antenatal care, early detection and management of preeclampsia and prophylactic use of magnesium sulphate.[14]

Inadequate number of health facilities and lack of adequate emergency obstetric services at the existing health facilities are important contributing factors. Poor educational status mainly illiteracy with an incidence of (55%) in this study adds to overall complicated scenario. Most of these women have little or no knowledge about antenatal, natal or postnatal care and any pregnancy related complications.[11] All these issues need to be addressed if more women are to be saved from dying.

Preterm delivery is common in women with eclampsia, as delivery is the cure for eclampsia after stabilizing the mother. Preterm birth rate in our study was 71.4% which is comparable with an Asian study.[15] CS was the main mode of these preterm deliveries (66.1%) and only (17%) delivered vaginally. Thus increased maternal morbidity also occurs in terms of surgical intervention, increased use of prophylactic antibiotics (82.1%), associated morbidity of surgery and anaesthesia which is consistent with many studies.[2,16]

Eclampsia is one of the major causes of maternal mortality. In U.K it was responsible for 2% maternal mortalities,[4] while in Nigeria it is third commonest cause of maternal mortality.[2] There were 3 maternal deaths in our study with a case fatality rate of 5.4%. There were 5 deaths in a Nigerian study,[2] with case fatality rate of 8.5% which is also comparable to another study.[15] However study from Bangladesh shows a much higher mortality of over 20%.[16]

Eclampsia not only increases maternal morbidity and mortality but also neonatal morbidity and mortality. Neonatal outcome reveals that 73.2% (41) babies were low birth weight. The proportion of LBW babies was more in this study as compared to a Nigerian

study where low birth weight babies were 30.4% (14) and 6 very low birth weight babies.[2]

There were 14 still births 25% with a perinatal mortality of 1.06 which is similar to a study with perinatal mortality rate of 25.45%,[15] and comparable to other studies from Nigeria and India.[17,18] NICU admissions were 54.8%(23).

$MgSO_4$ anticonvulsant therapy is the drug of choice for prevention and treatment of convulsions in women with preeclampsia and eclampsia.[19] Magpie Trial shows that $MgSO_4$ halves the risk of eclampsia in preeclampsia women.[19] $MgSO_4$ was used in 53(94%) cases in our study while other anticonvulsants were used only in 4 cases. Introduction of $MgSO_4$ reduced mortality rates significantly from 16% to 8% in a study conducted in Dhaka Bangladesh.[16] The Collaborative Eclampsia Trial strongly recommends routine use of $MgSo_4$ in eclampsia rather than use of either diazepam or phenytoin.[20] Despite of high use of $MgSO_4$, there were 3 deaths reported as women had already developed complications and become too sick to be saved. This is a reflection of several cultural, social, financial and transportation barriers that women face in our population.

Conclusion

Eclampsia remains a major cause of maternal and perinatal morbidity and mortality. More sensitization and health education is required amongst women regarding antenatal care and danger signs of preeclampsia and eclampsia. Involvement of governmental and NGO stakeholders to increase the number of easily accessible health care facilities and provision of emergency obstetric care with well trained staff at already existing health care facilities is highly important. Similarly well-organized fast referral system with availability of intensive care for critical patients will help to reduce burden of disease and consequent morbidity and mortality. Educating the girl child and better access to health facilities should be the way forward.

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Quote

"I have always maintained that no nation can ever be worthy of its existence that cannot take its women along with the men. No struggle can ever succeed without women participating side by side with men. There are two powers in the world; one is the sword and the other is the pen. There is a great competition and rivalry between the two. There is a third power stronger than both, that of the women".

Muhammad Ali Jinnah

Islamia College, Peshawar