

Original Research Article

A study of maternal deaths from preeclampsia and eclampsia in a tertiary care centre

Chuppana Ragasudha^{1*}, Atluri Phani Madhavi², Pulidindi Sanjana Sharon³, Satyala Satya Priya⁴, Syed Shehnaz⁴

¹Assistant Professor of Obstetrics and Gynecology, AMC, India

²Civil Assistant Surgeon, Labour Room, AMC, India

³Under graduate student of MBBS, RIMS, Srikakulam, India

⁴Postgraduate Student of Gynecology, AMC, India

*Corresponding author email: ragasudhadr@gmail.com

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|  | International Archives of Integrated Medicine, Vol. 5, Issue 1, January, 2018. | |
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| | Available online at http://iaimjournal.com/ | |
| | ISSN: 2394-0026 (P) | ISSN: 2394-0034 (O) |
| | Received on: 14-12-2017 | Accepted on: 20-12-2017 |
| | Source of support: Nil | Conflict of interest: None declared. |
| How to cite this article: Chuppana Ragasudha, Atluri Phani Madhavi, Pulidindi Sanjana Sharon, Satyala Satya Priya, Syed Shehnaz. A study of maternal deaths from preeclampsia and eclampsia in a tertiary care centre. IAIM, 2018; 5(1): 6-10. | | |

Abstract

Background: Hypertensive disorders of pregnancy (HDPs) affect about 10% of all pregnant women around the world and are an important cause of maternal and perinatal mortality and morbidity. In Asia and Africa, nearly one tenth of all maternal deaths are associated with hypertensive disorders of pregnancy. Predicting the onset of these complications could aid in timely interventions such as increased surveillance, treatment of symptoms, transfer to higher care facility and delivery when necessary, which could reduce morbidity and mortality from the HDPs.

Aim: It was to calculate the total number of women admitted with hypertensive disorders and eclampsia in the labor room and their case fatality rate, to calculate the number of mothers died from preeclampsia and eclampsia, to critically analyze all the mothers who died from preeclampsia in order to identify the root causes of substandard care leading to maternal deaths.

Materials and methods: This prospective study was carried out in the labor room, Department of Obstetrics and Gynecology, King George Hospital, Andhra Medical College for a period of twelve months from November 2016 to October 2017. All the mothers who died from severe preeclampsia and eclampsia were included in the study and they were all analyzed modeled on the United Kingdom Confidential Enquiries into maternal deaths.

Results: In one year there were 530 women admitted with hypertensive disorders and 144 with

eclampsia giving a prevalence of 9.04% and 2.45% respectively. Case fatality rate of preeclampsia was 2.26% and eclampsia was 4.1%. During the study period there were 44 total maternal deaths. Out of 44 maternal deaths, 12 were from severe preeclampsia and eclampsia making it the second leading cause of maternal mortality in our institute.

Conclusion: The majority of deaths related to hypertensive disorders can be avoided by providing timely and effective care to women presenting with complications. Thus, optimization of health care for women during pregnancy to prevent and treat hypertensive disorders of pregnancy is a necessary step towards achievement of the Millennium Development Goals.

Key words

Preeclampsia, Eclampsia, Abruption, Maternal mortality, Pulmonary edema, Acute kidney injury.

Introduction

Hypertensive disorders of pregnancy (HDPs) affect about 10% of all pregnant women around the world and are an important cause of maternal and perinatal mortality and morbidity. In Asia and Africa, nearly one tenth of all maternal deaths are associated with hypertensive disorders of pregnancy [1]. Predicting the onset of these complications could aid in timely interventions such as increased surveillance, treatment of symptoms, transfer to higher care facility and delivery when necessary, which could reduce morbidity and mortality from the HDPs [2].

Preeclampsia and eclampsia have remained a significant public health threat in both developed and developing countries contributing to maternal and perinatal morbidity and mortality globally. In one study the prevalence of preeclampsia was 5.6% and that of eclampsia was 0.6% in India [3] which is similar to global numbers. However, the impact of the disease is felt more severely in developing countries, where, the risk that a woman in a developing country will die of preeclampsia or eclampsia is about 300 times that of a woman in a developed country [4]. Approximately 72,000 pregnant women die every year because of eclampsia and severe preeclampsia. That amounts to nearly 200 women every day. Since pregnant women in developing countries are amongst the most vulnerable populations in the world, community health care workers should be trained properly to provide timely care to women with HDPs. Prevention strategies should be applied to every

pregnant woman since we cannot predict who will develop pre-eclampsia given the limitation in resources [5, 6]. Measuring blood pressure and testing urine for proteinuria should be made available to every pregnant lady and should be referred to the nearest health care facility where such women can be managed properly. Predicting the onset of maternal complications such as eclampsia, stroke, damage to kidneys and lungs could aid in timely interventions such as increased surveillance, treatment of symptoms, transfer to higher care facility and delivery when necessary, which could reduce morbidity and mortality from the HDPs [2]. The aim of this study is to sensitize health care providers of the importance of early diagnosis, early referral and timely management to save these women from preventable deaths with good standard of care.

International Society for the Study of Hypertension in Pregnancy (ISSHP) advocates consensus in the classification, diagnosis and management of HDPs. By adopting these women with preeclampsia can be managed optimally. The revised classification for hypertensive disorders in pregnancy by ISSHP is as follows [7]:

- Chronic hypertension
- Gestational hypertension
- Preeclampsia- denovo or superimposed on chronic hypertension
- White coat hypertension

Pre-eclampsia is defined as denovo hypertension after 20 weeks and the coexistence of one or more of the following new-onset conditions:

Proteinuria (spot urine protein/creatinine >30 mg/ mmol (0.3 mg/mg) or >300 mg/day or at least 1g/L ('2 + ') on dipstick testing)

Other maternal organ dysfunction:

- renal insufficiency (creatinine > 1.02 mg/dL)
- liver involvement (elevated transaminases – at least twice upper limit of normal ± right upper quadrant or epigastric abdominal pain)
- neurological complications (examples include eclampsia, altered mental status, blindness, stroke, or more commonly hyperreflexia when accompanied by clonus, severe headaches when accompanied by hyperreflexia, persistent visual scotomata)
- hematological complications (thrombocytopenia – platelet count below 150,000/dL, DIC, haemolysis)

Uteroplacental dysfunction: fetal growth restriction

Specific indications for delivery of women with pre-eclampsia are as follows

- Women with pre-eclampsia at >37 weeks gestation should be delivered
- Women with pre-eclampsia between 34 and 37 weeks can be managed with an expectant conservative approach, as below.
- Women with pre-eclampsia at <34 weeks gestation should be managed with a conservative (expectant) approach at a center with Maternal and Fetal Medicine expertise, delivery being necessary when one or more of the following indications emerge:
 - Inability to control maternal blood pressure despite antihypertensives.
 - Maternal pulse oximetry <90% or pulmonary oedema

unresponsive to initial diuretics.

- Progressive deterioration in liver function, GFR, haemolysis or platelet count.
- Ongoing neurological symptoms or eclampsia
- Placental abruption
- Reversed end-diastolic flow in the umbilical artery Doppler velocimetry, a non-reassuring CTG, or stillbirth

If local protocols and guidelines are prepared and followed using recommendations by ISSHP maternal and perinatal mortality and morbidity can be reduced [8, 9].

Materials and methods

This prospective study was carried out in the labour room, Department of Obstetrics and Gynaecology, King George hospital, Andhra medical college, a tertiary care centre in Andhra Pradesh, for a period of one year from November 2016 to October 2017. The study setting is one of the largest tertiary care center in the state of Andhra Pradesh, King George Hospital, Visakhapatnam where pregnant women are referred from 100 to 200 kilometers surrounding the Hospital including tribal areas. There are around 20 admissions per day to the Labor room out of which five to seven on an average are referrals. All the women admitted during pregnancy or within 42 days of termination of pregnancy or delivery who died of preeclampsia and eclampsia and their complications were included in the study. Pregnant women who died of AFLP were not included. All the case sheets of 12 women who died of preeclampsia and eclampsia were analyzed critically modeled on the United Kingdom Confidential Enquiries into maternal deaths. Data was collected using structured proforma from the time of admission to the time of death. Information contained socioeconomic background, time of occurrence of death whether early antepartum, late antepartum, intrapartum or postpartum, demographic factors, risk factors, causes, time interval between admission and death, to identify

failure or delay in diagnosis, failure to appreciate the severity of the woman's condition with resultant delay in giving appropriate treatment.

Results and Discussion

During the study period of one year there were 530 women with hypertensive disorders of pregnancy and 144 women with eclampsia giving the prevalence rates of 9.04% and 2.45% respectively. There 12 deaths from HDPs contributing to 27% of total maternal deaths in our institute in the past one year, the second leading cause of maternal mortality following sepsis. Case fatality rate in women admitted with HDPs in our labor room was 2.26%.

Table - 1: The socio- demographic characteristics of women who died from hypertensive disorders of pregnancy.

| Characteristics | N= 12 Number (%) |
|-----------------------------|------------------|
| Age | |
| <30 years | 11 (91) |
| >30 years | 1 (9) |
| Parity | |
| Nulliparous | 5 (41) |
| Multiparous | 7 (58) |
| Socioeconomic status | |
| Low | 12(100) |
| High | 0 (0) |
| Location | |
| Urban | 2 (16) |
| Rural | 8 (66) |
| Tribal | 2 (16) |
| BMI | |
| <17 | 0 (0) |
| 17 – 25 | 11 (91) |
| 25 – 35 | 0 (0) |
| >35 | 0 (0) |

The ages of the women who died from preeclampsia/eclampsia ranged between 21 and 36 years with a mean age of 24 years. Out of these only one woman was of 36 years and the remaining 91% of them were between 21 and 28 years. All the women who died of HDPs were referrals from rural and tribal areas and were of low socioeconomic status and of normal BMI.

Parity ranged from 0 to 3; five were primigravid. One woman had twin pregnancy and the remaining 11 were singletons (**Table – 1**).

Table - 2: Timing of maternal deaths from hypertensive disorders of pregnancy.

| Time period of deaths in the pregnancy | N = 12 Number (%) |
|--|-------------------|
| Antenatal period | 2 (16) |
| Within 24 hours from delivery | 4 (33) |
| Postnatal 1 to 42 days after delivery | 6 (50) |

Table - 3: Causes of death among women who died from hypertensive disorders of pregnancy.

| Cause of death | N=12 Number (%) |
|-------------------------|-----------------|
| Pulmonary edema | 5 (41) |
| Multi organ failure | 4 (33) |
| DIC | 2 (16) |
| Intracranial hemorrhage | 1 (8) |

The average gestational age at presentation was 35weeks 6 days with the range of 30 weeks to 40 weeks for all the women who died of preeclampsia/ eclampsia. There was only one woman who presented at 30 weeks and five have presented between 34 week and 37 weeks and the remaining five after 35 weeks. It is sometimes said that preeclampsia at term is a benign condition. This is not necessarily so. Early onset preeclampsia is, overall, a more aggressive condition than late-onset disease, but fulminating, ultimately fatal, preeclampsia also occurs at term [8]. Timing of maternal deaths from hypertensive disorders of pregnancy was as per **Table – 2**.

Seven women had eclamptic fits, five had eclampsia during antenatal period and one in the postpartum period on 11th postnatal day in the community. There was evidence of HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome in four women and four women had abruption. Five of the 12 women died from pulmonary edema. Of the other causes of death, four died from multi organ failure in intensive care units, two from DIC secondary to

abruption and one from intracranial hemorrhage (**Table – 3**).

11 were intrauterine deaths (9 singletons and one twin gestation) and two babies were delivered with low APGAR of 4 at 5 minutes. **Table – 3** shows the impact and burden of preeclampsia on maternal and perinatal mortality and morbidity.

Conclusion

Deaths from hypertensive disorders of pregnancy still continue to be alarmingly high which is a sign of substandard care both in community and hospital. There are still many lessons to be learned from these women who have died. All pregnant women should have a blood pressure and urine check for albumin at each health care contact in both primary and secondary care, as well as after delivery. All health care professionals taking care of pregnant women should be trained well to diagnose preeclampsia and should have the indicators for delivery in preeclampsia in place since early diagnosis and timely delivery saves many from its fulminant and fatal course.

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