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### RESEARCH ARTICLE

#### EVALUATING THE MATERNAL OUTCOME IN OBSTETRIC ICU A STUDY FROM A TERTIARY CARE HOSPITAL IN SOUTH INDIA

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#### Manuscript Info

##### Manuscript History

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#### Abstract

**Background :** Critically ill obstetric patients pose challenges to the intensive care unit team due to their altered physiology as well as due to the presence of the foetus and safety of both the mother and the foetus is of most important. A better knowledge of the spectrum, characteristics and outcomes of the diseases involving this group of patients is the first step towards achieving prevention and the current study is done to supplement the present knowledge on obstetric emergencies requiring ICU care.

**Aims and Objectives :** The objective is to study the profile of cases admitted to obstetric ICU and to evaluate maternal outcome and prognosis.

**Materials and Methods :** This is observational study was conducted at Andhra Medical College, Visakhapatnam a tertiary care hospital from January 2022 to June 2022.

1. All antenatal women irrespective of the period of gestation and postnatal women within 42 days of delivery requiring ICU admission for obstetric, non-obstetric reasons, irrespective of age, parity, mode of delivery, and co-morbid conditions were included.
2. Results were subjected to statistical analysis and conclusions drawn.

**Results :** During the study period of 6 months, a total number of 82 obstetric patients were admitted to ICU. Specific interventions that had been undertaken at the ICU (such as the use of intubation, mechanical ventilation, and intensive monitoring) were recorded. The complications that were encountered at the ICU, such as disseminated intravascular coagulation (DIC) and multiorgan failure, were recorded. Majority were of obstetric reasons (n=58, 70.7%). Non-obstetric reasons (n=24, 29.3%) 28 maternal deaths occurred during the study period. Most common cause of death in our study was MODS followed by complications of hypertensive disorders of pregnancy.

**Discussion :** Present centre being a tertiary care hospital majority of the women had severe complications and many were referred after a significant amount of delay. This stresses the idea that, in cases involving obstetric patients, there could not be much time for transfer to an intensive care unit and that things could swiftly deteriorate. Lack of antenatal care, poor socio economic background, delay in referral from the peripheral health centres predicted poor outcomes.

**Conclusion :** The findings of the present study reinforce the statement by WHO that “There is a story behind every maternal death or life-threatening complication. Understanding the lessons to be learned can help to avoid such outcomes”. A multidisciplinary team approach is required in ICU. All residents of obstetrics and gynaecology should have short mandatory training phase in critical care.

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### **Introduction:-**

- Critically ill obstetric patients pose challenges to the intensive care unit team due to their altered physiology as well as due the presence of the foetus and safety of both the mother and the foetus is of most important.
- The incidence of pregnant women admitted to intensive care unit (ICU) in developed countries is 2 to 4 per 1,000 deliveries as compared with 2 to 13.5 per 1,000 deliveries in developing countries.[1]
- Although obstetric patients form a significant proportion of ICU admission in developing countries, there are only a few studies reporting on critical illness during pregnancy .
- According to the World Health Organization (WHO),“there is a story behind every maternal death or life threatening complication, and understanding the lessons to be learned can help to avoid such outcomes”.[2]
- A better knowledge of the spectrum, characteristics and outcomes of the diseases involving this group of patients is the first step towards achieving prevention and the current study is done to supplement the present knowledge on obstetric emergencies requiring ICU care.

### **Aims and Objectives:-**

- The objective is to study the profile of cases admitted to obstetric ICU and to evaluate maternal outcome and prognosis.

### **Materials and Methods:-**

- This is observational study was conducted at Andhra Medical College ,visakhapatnam a tertiary care hospital from January 2022 to June 2022 .
- All antenatal women irrespective of the period of gestation and postnatal women within 42 days of delivery requiring ICU admission for obstetric, non-obstetric reasons,irrespective of age, parity, mode of delivery, and co-morbid conditions were included .
- Results were subjected to statistical analysis and conclusions drawn.

### **Results:-**

- The relevant data collected according to proforma was analysed with respect to patient characteristics, obstetric history, pre-existing medical disorders and the causes that necessitated admission to the ICU.
- Specific interventions that had been undertaken at the ICU (such as the use of intubation, mechanical ventilation, and intensive monitoring )were recorded. The complications that were encountered at the ICU, such as disseminated intravascular coagulation (DIC) and multiorgan failure, were recorded.
- During the study period of 6 months, a total number of 82 obstetric patients were admitted to ICU.
- Most of the patients admitted to the ICU were young between 21 to 25 years(60%)
- 56 (68%) were from rural areas and 26(32%) from urban areas.
- Majority 70 cases (85%) of them were registered /booked at other hospitals, referred to our hospital because of complications
- 45(54.8%) were primigravida’s . Majority were in third trimester 24(29.2%) and postpartum period 48(58.5%) and rest were in I and II trimesters .
- 48 (58.5%) were admitted to ICU in the postpartum period and 34 (41.4%) were admitted in antenatal period .
- 34 (41.4%) showed pallor, 30(36.5%)pedal edema and 15 (18.2%) had icterus at admission; Hypotension was noted in 15 (18.2%) and hypertension in 23 (28.04%).
- Majority were of obstetric reasons (n=58, 70.7%) of which (n=23, 39.6%) had hypertensive disorders of pregnancy, (n=12, 20.6%) had obstetric haemorrhage, (n=20.6%), (n=11, 18.9 %) had ectopic pregnancy, (n=9, 15.5%) are associated with sepsis where as (n=3, 5.1%) had rupture uterus.

- Non-obstetric reasons (n=24, 29.3%) of which 7(9.3%) cases are infected with dengue, (n=6, 25%) are associated with cardiac disorders, renal causes such as AKI constitute (n=4 16.6%), (n=3, 12.5%) are associated with pneumonia whereas few of them are admitted due to DKA, AFLP, TRALI (n=1 4.1%).
- Mostly termination of pregnancy was LSCS followed by vaginal delivery . Mechanical ventilation was needed in 48(58.7%) followed by inotropic support in 32(40%). Transfusion of Blood and blood products was needed in 60(73.1%). More than five units of blood and blood products transfusion were required in 36.5% of patients.

**Indication for ICU admission No. of 28** maternal deaths occurred during the study period Most common cause of death in our study was MODS followed by complications of hypertensive disorders of pregnancy .

#### Percentage(%)

Indication for ICU admission	No. of patients	Percentage(%)
<b>Obstetric causes</b>	<b>58</b>	<b>70.7</b>
<b><i>Hypertensive disorders</i></b>	<b>23</b>	<b>39.6</b>
Preclampsia	12	20.6
Eclampsia	8	13.7
HELLP	3	5.1
<b><i>Obstetric hemorrhage</i></b>	<b>15</b>	<b>25.8</b>
PPH	9	15.5
APH - Abruption	4	6.8
Placents previa	2	3.4
<b><i>Sepsis</i></b>	<b>9</b>	<b>15.5</b>
<b><i>Rupture ectopic</i></b>	<b>8</b>	<b>13.7</b>
<b><i>Rupture uterus</i></b>	<b>3</b>	<b>5.1</b>

Indication for ICU admission	No. of patients	Percentage(%)
<b>Non-obstetric causes</b>	<b>24</b>	<b>29.3</b>
Dengue	6	25
Pneumonia	3	12.5
Cardiac failure	4	16.6
PAH	2	8.3
Jaundice complicating pregnancy	2	8.3
AKI	4	16.6
DKA	1	4.1
AFLP	1	4.1
TRALI	1	4.1

CAUSE OF DEATH	NUMBER OF PATIENTS	PERCENTAGE
SEPSIS AND MODS	12	42.8
HYPERTENSIVE DISORDERS	9	32.1
PPH	2	7.1
CARDIAC DISEASES COMPLICATING PREGNANCY	2	7.1
ARDS	2	7.1
PULMONARY THROMBO EMBOLISM	1	3.5

### Discussion:-

- The present study included analysis of women admitted to obstetric ICU.
- The rate of ICU admission is varied due to differences in patient characteristics and presentations.
- Obstetric cases formed 2-7% of all ICU admissions.[3] Obstetric ICU designed specifically for pregnant and postpartum women was not available in present centre. There is definitely a requirement for a dedicated obstetric ICU.
- Around 10% of women has more than one complication necessitating ICU admission. Around 5% of them had two complications and about 4% had three complications.
- Majority of the admission were post partum in obstetric ICU . This finding is consistent with other similar studies of ICU.[7-8] The most common conditions for all obstetric ICU admissions included pregnancy related hypertensive disorders followed by haemorrhage and sepsis. This is in consistent with findings of other studies done in intensive care settings.[8]However certain other studies have reported haemorrhage as the most common cause of ICU admission.[3-5]
- The higher rate of obstetric compared to medical complications is consistent with findings of other studies.[6]
- Caesarean section was the most common intervention in present study. The higher rate of caesarean sections seen in present study could be because of higher number of complicated cases referred in late stages.
- Present centre being a tertiary care hospital majority of the women had severe complications and many were referred after a significant amount of delay .This stresses the idea that, in cases involving obstetric patients, there could not be much time for transfer to an intensive care unit and that things could swiftly deteriorate. Lack of antenatal care, poor socio economic background, delays in referral from the peripheral health centres predicted poor outcomes.

### Conclusion:-

- The findings of the present study reinforce the statement by WHO that “There is a story behind every maternal death or life-threatening complication. Understanding the lessons to be learned can help to avoid such outcomes”. [2]
- Low socioeconomic status, lack of education and poor antenatal care, late referral of high-risk cases have been found to have a considerable effect on obstetric complications and outcome.
- Awareness should be created among the population regarding the importance of adequate antenatal care, detection of the danger signs of various obstetric complications and need for contacting the medical facility at the earliest in a case of emergency situations.
- Early detection and prompt referral to the tertiary centre with intensive care facilities should be promoted among the medical fraternity to reduce the incidence of ICU admissions, maternal mortality and morbidity.
- Optimum care of circulation, blood pressure, and ventilation could minimize the prevalence of multiple organ failure and mortality in critically ill obstetric patients admitted to ICU.
- To achieve all of these, a multidisciplinary team approach is required in ICU. All residents of obstetrics and gynaecology should have short mandatory training phase in critical care.

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