

**A Prospective Study Evaluating the Primary Reasons and Pattern of Obstetric Cases Referred to a Tertiary Care Centre****Rashmi Kumari<sup>1</sup>, Priti Kumari<sup>2</sup>, Krishna Sinha<sup>3</sup>**<sup>1</sup>Senior Resident, Department of Obstetrics and Gynaecology, JLNMCH, Bhagalpur, Bihar, India<sup>2</sup>Senior Resident, Department of Obstetrics and Gynaecology, JLNMCH, Bhagalpur, Bihar, India<sup>3</sup>Associate Professor, Department of Obstetrics and Gynaecology, JLNMCH, Bhagalpur, Bihar, India

Received: 04-03-2023 / Revised: 09-04-2023 / Accepted: 26-04-2023

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Conflict of interest: Nil

**Abstract****Aim:** The objective of the present study was to study the primary reasons and pattern of obstetric cases referred to a tertiary care centre and management of its complications**Material & methods:** A Prospective observational study including 100 patients within duration of two years in the Department of Obstetrics and Gynecology of JLNMCH, Bhagalpur, Bihar, India . Written informed consent was sought from all study participants. We studied 50 patients.**Results:** Maximum number of cases in the present study was in the age group 20-30 yrs, comprising 76% of total cases. Out of 50 patients, 24 were primigravids (48%). The antecedent causes for admission to ICU are grouped into two - Obstetric and non -obstetric causes. The Obstetric causes accounted for 76% of the admissions in ICU and non-obstetric causes were 24%. Commonest risk factor for ICU admission was hypertensive disorders of pregnancy and obstetric haemorrhage. Other major risk factors were heart disease and sepsis. Major cause of maternal mortality was multi-organ-dysfunction and sepsis secondary to massive obstetric haemorrhage. Majority of them delivered by cesarean section (74%) and the rest were vaginally (24%). The indications of LSCS were Severe Pre-eclampsia, CPD, malposition & eclampsia. Among the total patients, MMR was 12%, 84% improved whereas 4% were discharged against medical advice. The main reasons for mortality were multi-organ-failure, sepsis, congestive cardiac failure and hemorrhagic shock following massive obstetric hemorrhage.**Conclusion:** The multi-disciplinary team approach in intensive care units, close monitoring, symptomatic treatment, prompt surgical intervention and safe motherhood initiative would reduce the current Maternal Mortality Rate. Development of standard referral protocol, availability of tertiary care, proper training in this regard is much needed.**Keywords:** Obstetric emergencies, Referral system, Intensive care units

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**Introduction**

22% of the population are constituted by women of childbearing age group of 15-45 years in India. They are vulnerable risk group which is due to pregnancy and child bearing. Most of the maternal deaths occur in developing countries where health-care system is not well organised. [1,2] Prevention of maternal mortality is one of our prime goals to provide safety to motherhood and to avoid loss to the family, society, and the nation. The World Health Organization reports that about 800 women die from pregnancy and birth related complications around the world every day. [3]. For a large majority of developing countries this aspect of health system remains weak. [4] The current Maternal Mortality Rate of India is 130 per lakh live births. [5] Approximately one-quarter of all pregnancy- and delivery-related maternal deaths

worldwide occurs in India, which has the highest burden of maternal mortality for any single country. [6,7]

India has come a long way in improving maternal health as evident from significant decline in maternal mortality ratio (MMR) from 130 in 2014–2016 to 113 in 2016–2018. [8] The key factors contributing to adverse maternal outcomes are lack of trained birth attendants, lack of education in society, poor families, family dependency of women and delay in seeking medical treatment. For providing access to essential obstetric care, the referral system is an essential component of health system which is important in pregnancy and child birth. Referral services for identification and referral of high-risk pregnancies are an integral part

of maternal and child health services. This has been possible after implementation of various health programs such as Janani Suraksha Yojana, ambulance services, and Janani Shishu Suraksha Karayakram. The World Health Organization estimates that at least 88–98% of maternal deaths can be averted with timely access to emergency obstetrics care services using efficient referral system. [9] 92% of maternal deaths are due to delay in referral and case management. Hence the referral system needs to be strengthened in order to provide emergency obstetric care. [10]

The study was aimed at reviewing the primary reasons and pattern of obstetric cases referred to an intensive care unit (ICU) in a tertiary care centre of BIHAR Region.

#### Material & Methods

A Prospective observational study including 100 patients within duration of one year (March 2020 to Feb 2021) in the Department of Obstetrics and Gynecology of JLNMC, Bhagalpur, Bihar, India during the study period. Written informed consent was sought from all study participants. We studied 50 patients.

#### Inclusion Criteria

- Enrolled all the obstetrics referrals to our tertiary care center  $\geq 28$  weeks of gestation.

#### Exclusion Criteria

- Postpartum referrals; self-referrals

- Referred cases less than 28 weeks of gestation.

#### Methodology

The study data was collected from case sheets of the patients referred and managed at tertiary teaching hospital. Detailed clinical history, place of referral, type of transport used, causes of referral were studied. Complete physical and obstetric examination was done and basic investigations such as complete blood counts, ABO/Rh, obstetrical ultrasound, and case specific investigations were carried out as mandated by clinical condition of the patient. Management of the patient, clinical course, mode of delivery (i.e., whether vaginal or operative) and maternal outcome in the form of maternal morbidity or mortality was noted. Patients were admitted in ICU and were treated by a multidisciplinary team consisting of Anesthesiologist & Critical Care experts, Neurologists, Cardiologists, Nephrologists along with obstetricians providing a daily consultation. All mothers were followed till discharge from the hospital

#### Statistical Analysis

Data were analyzed using Microsoft office Excel 2013. Descriptive statistics like percentages using Statistical Package for Social Sciences (SPSS) software version 23 were used for analysis. The results were computed in the form of percentage.

#### Results

**Table 1: Demographic details**

Age (yrs)	Number of cases	%
< 20	8	16
20-30	38	76
> 30	4	8
<b>Critical care in obstetrics: parity</b>		
1	24	48
2	17	34
3	5	10
$\geq 4$	4	8
<b>Critical care in obstetrics: Antecedent causes</b>		
Obstetric cases	38	76
Non-obstetric cases	12	24

Maximum number of cases in the present study was in the age group 20-30 yrs, comprising 76% of total cases. Out of 50 patients, 24 were primigravids (48%). The antecedent causes for admission to ICU are grouped into two - Obstetric and non -obstetric causes. The Obstetric causes accounted for 76% of the admissions in ICU and non-obstetric causes were 24%.

**Table 2: Critical care in obstetrics: Analysis of antecedent causes**

Antecedent cause	Diagnosis	Frequency	Total	%	
Hypertensive disorders of Pregnancy	Severe Preeclampsia with Hypertensive Crisis	8	14	28	
	Eclampsia	6			
Obstetric causes	Antepartum Hemorrhage	7	14	28	
	Postpartum Hemorrhage	7			
	Sepsis	Ectopic pregnancy	3	8	4
		Sepsis	5		
Heart Failure	Anemia	4	12	6	

		Rhd/Cardio-myopathy	8		
<b>Medical causes</b>	Respiratory disorder	Pulmonary Embolism	1	2	1
		ARDS	1		

Commonest risk factor for ICU admission was hypertensive disorders of pregnancy and obstetric haemorrhage. Other major risk factors were heart disease and sepsis. Major cause of maternal mortality was multi-organ-dysfunction and sepsis secondary to massive obstetric haemorrhage.

**Table 3: Critical care in obstetrics: mode of delivery and Maternal mortality analysis**

<b>Mode of delivery</b>	<b>N</b>	<b>%</b>
Vaginal	12	24
LSCS	37	74
Laparotomy	1	2
<b>Maternal mortality analysis</b>		
<b>Antecedent cause</b>	<b>Death</b>	<b>%</b>
Hemorrhagic shock	1	2
MODS, Sepsis	3	6
CCF	2	4

Majority of them delivered by cesarean section (74%) and the rest were vaginally (24%). The indications of LSCS were Severe Pre-eclampsia, CPD, malposition & eclampsia. Among the total patients, MMR was 12%, 84% improved whereas 4% were discharged against medical advice. The main reasons for mortality were multi-organ-failure, sepsis, congestive cardiac failure and hemorrhagic shock following massive obstetric hemorrhage.

### Discussion

Referral services for identification and referral of high risk pregnancies are an integral part of maternal and child health services. For a large majority of developing countries this aspect of health system remains weak. [11] The 3-tier health care delivery system was conceived in such a manner that the patients in need of a higher level of expertise and care could be referred accordingly from primary to secondary directly to tertiary level centre. The Prevention of Maternal Mortality (PMM) network study has proposed a three delays model for referrals in obstetric and gynaecological emergencies. [12] A study showed that 92% of maternal deaths are due to delay in referral and case management, first delay in making decision to seek care, 2nd delay is due to delay in identifying and reaching a medical facility, 3rd delay is due to delay in receiving adequate and prompt treatment even after reaching a care institution. [13,14] Timeliness and appropriateness of referral are a challenge to health care providers, since delay in referral adversely affects maternal and neonatal outcome. [15] Hence, identification and referral of high risk pregnancies and obstetric emergencies are an integral part of maternal and child health services, to reduce the fetal and maternal morbidity and mortality. Appropriate and timely referral

ensures continuity of care and inspires confidence in consumers in the health care system. [16]

Maximum number of cases in the present study was in the age group 20-30 yrs, comprising 76% of total cases. Out of 50 patients, 24 were primigravids (48%). Morsheda Banu et al on assessing the overall age distribution found that majority (74%) of the respondents were between 20-35 years. [17] Gupta PR et al found 52.17% patients were primigravida. [18] The antecedent causes for admission to ICU are grouped into two - Obstetric and non-obstetric causes. The Obstetric causes accounted for 76% of the admissions in ICU and non-obstetric causes were 24%. Commonest risk factor for ICU admission was hypertensive disorders of pregnancy and obstetric haemorrhage. Other major risk factors were heart disease and sepsis. Major cause of maternal mortality was multi-organ-dysfunction and sepsis secondary to massive obstetric haemorrhage. Patel HC et al, in their study found that causes of referral were preeclampsia (16%), MSL (5%). [19]

Majority of them delivered by cesarean section (74%) and the rest were vaginally (24%). The indications of LSCS were Severe Pre-eclampsia, CPD, malposition & eclampsia. Among the total patients, MMR was 12%, 84% improved whereas 4% were discharged against medical advice. The main reasons for mortality were multi-organ-failure, sepsis, congestive cardiac failure and hemorrhagic shock following massive obstetric hemorrhage. The reasons for referral included both obstetric and non-obstetric, and more so structural or system problems since majority of referred cases did not need sophisticated equipment or personnel to manage. The leading cause of maternal mortality in this study was obstetric haemorrhage [20] and complications of obstructed labour. The high percentage of maternal deaths occurring in the

immediate postpartum period elicited in our study confirms the importance to be placed on early identification and referral of high-risk patients before the onset of labour or delivery.

### Conclusion

The multi-disciplinary team approach in intensive care units, close monitoring, symptomatic treatment, prompt surgical intervention and safe motherhood initiative would reduce the current Maternal Mortality Rate. Peripheral health care system needs to be strengthened and practice of early referral needs to be implemented for better maternal outcome. Health education to the community, better antenatal care up to grass root level, emergency intranatal care, availability of services of skilled birth attendants at the time of child birth, well organized first referral centre with better transportation facility, availability of blood round the clock, anaesthetic facilities and availability of specialist in the field of obstetrics at the referral unit will definitely reduce maternal morbidity and mortality.

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