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MATERNAL NEAR MISS PATIENTS IN RURAL TERTIARY CARE CENTER - CLINICAL AND SOCIAL FACTORS

Obstetrics & Gynaecology

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ABSTRACT

Maternal deaths are merely the tip of the iceberg. The broad base of this iceberg represents the maternal near miss patients. This has emerged as an adjunct to investigation of maternal deaths as the two have similar pathological and circumstantial factors. These cases help us analyse and prevent obstetrical catastrophes. **Aim:** To assess the various complications leading to maternal near miss at rural tertiary care center in Maharashtra, to evaluate the socio-economic and clinical characteristics involved in these patients. **Objective-** To record the condition of the near-miss patients during admission, their mode of delivery, the primary cause and the key interventions used. **Method:** A prospective observational type of Study Design used and we conducted a study in a tertiary care centre of Maharashtra for 19 months from December 2022 to June 2024. All pregnant women of reproductive age group attending Obstetrics and gynaecology department of our hospital with diagnosis of near miss according to the WHO maternal near miss criteria and who followed up were included. **Results:** A total of 102 cases of near miss & 14 maternal deaths were observed. The Maternal near miss Mortality ratio was 7.3:1. 47% cases were between age 21 - 25 years. 47% were primigravida. 86.3% reside in rural areas. Majority cases were from lower or lower middle socioeconomic classes. 21.6% were illiterate while 60.8% were educated up to primary level. 72.5% were referred cases. 40% of mothers had inadequate antenatal checkups. Major socio-economic factors for Probable MNM seen in present study were: lack of accessibility of hospital (71%), Inability of understand the problem (67%). Most common etiology for maternal near miss was hypertension disorders (40.2%) followed by hemorrhage and medical complication (22.5%). LSCS was required in 58.8%. Most cases had hospital stay between 7 to 14 days (84.3%). ICU stay was seen for 1 to 3 days in 90.2% cases. Blood Transfusion was done in 62.7% cases. **Conclusion:** Present study showed the common etiologies, interventions, common socio-economic factors of near-miss cases. The addition of near miss audits allows the care of critically ill women to be analyzed, deficiencies in the provision of care to be identified, and comparisons within and between institutions and countries to be carried out over time. This will improve the quality of obstetric care and further reduce maternal morbidity and mortality.

KEYWORDS

maternal near-miss, maternal deaths, preeclampsia, eclampsia, hemorrhage.

INTRODUCTION

'Difficulties mastered are opportunities won.'

-Winston Churchill

There have been constant efforts globally to improve reproductive health status of women, over decades. The Millennium Developmental Goal aimed to pull down the Maternal Mortality Rate (MMR) by three quarters and achieve universal access to reproductive health, between year 1990 to year 2015) [1]. India's progress towards achieving this goal has been rather slow. In year 1990, MMR in India was 570 per one lakh live birth [2]. The MMR decreased from 167 in 2011-2013 to 130 in 2014-2016 and 97 in 2018-2020 [3]. Across the globe, the maternal mortality ratio has also decreased by 28.7% from 223 deaths to 158.8 deaths per 1 lakh live births, from year 2000 to 2020 [4]. Over the years, efforts have been directed to formulate strategies for uplifting the health status of women in India. Maternal mortality ratio reflects overall health status of women in society. Maternal mortality ratio is widely used as key indicator of the social, economic and health development and to assess maternal deaths in population [5]. However, maternal mortality ratio in itself is insufficient to probe into pregnant women's health status. Since, there is decline in absolute number of maternal deaths; it has become less reliable to measure the efficacy of health care system [6]. There are far many pregnant women who survive the acute obstetric event despite being critically ill, and escape maternal mortality.

Severe Acute Maternal Morbidity (SAMM) or Maternal near miss (MNM) is defined as “A woman who nearly died but survived a complication that occurred during pregnancy, child birth or within 42 days of termination of pregnancy” [7]. Recently, MNM has been widely used to evaluate the quality of obstetric care; the woman receives, in a given health facility. The advantage of using MNM cases as health indicator includes [7]:

- Near misses are more common than maternal deaths.
- Their review yields useful information on the same pathways that lead to severe morbidity and death.
- Investigating the care received may be less threatening to providers because the woman survived.
- One can learn from the women themselves since they can be interviewed about the care they received.
- All near misses should be interpreted as free lessons and opportunities to improve the quality-of-service provision

Maternal deaths are merely the tip of the iceberg of maternal disability. For every woman who dies, many more will survive but often suffer from lifelong disabilities.

To improve the healthcare system in terms of facility of testing, equipment, and personnel, near-miss registries provide valuable information on deficiencies in healthcare facilities for pregnant women and help to identify the requirements for improved referral facilities and the need for various health awareness programs. In an attempt to follow the WHO mandate to initiate near-miss reviews in all settings in all countries, India's national technical group in 2014 proposed a set of local-specific expert consensus criteria [8]. We can easily analyze high-risk pregnant women as well as plan and carry out important interventions for obstetrical catastrophes and create awareness programs for good results by effectively implementing the guidelines and the WHO's near-miss concept.

As our center is a tertiary care center that receives a large number of referral cases from most rural areas and marginal areas of other states, we designed this study at our institute to assess the socio-economic and clinical characteristics along with various complications leading to maternal near miss at the rural tertiary care center.

MATERIAL AND METHOD

Type: Prospective Study

Duration: 19 months, December 2022 to June 2024

Place: A rural tertiary care hospital in Maharashtra was chosen as it is a teaching institute and a hub for referrals of high-risk cases from peripheral hospitals.

Inclusion Criteria

All pregnant women of reproductive age group attending the Obstetrics and gynecology department of our tertiary care hospital with a diagnosis of near miss according to the WHO maternal near miss criteria who gave consent and agreed to follow up are included.

Exclusion Criteria: All near-misses that do not fulfill the inclusion criteria and obstetric deaths are excluded.

RESULTS

Near miss status	**N**	**%**
Near miss	102	87.9%
Mortality	14	12.1%
Age group (yrs)	N	%
</=20	28	27.5%
21-25	48	47.1%
26-30	18	17.6%
> 30	8	7.8%
Total	102	100.0%
Obstetric History	N	%
Primigravida	48	47.1%
Multigravida	54	52.9%
Total	102	100.0%
Period of Gestation	N	%
<20 weeks (including abortions)	8	7.8%
20-32 weeks	24	23.5%
32- till delivery	38	37.3%
Intrapartum	18	17.6%
Post-partum	14	13.7%
Total	102	100.0%
Residence	N	%
Rural	88	86.3%
Urban	14	13.7%
Total	102	100.0%
Socioeconomic class (kuppuswamy scale)	N	%
Upper	2	2.0%
Upper middle	9	8.8 %
Lower Middle	32	31.4%
Upper lower	40	39.2%
Lower	19	18.6%
Total	102	100.0%
Education	N	%
Illiterate	22	21.6%
Primary	62	60.8%
Secondary	18	17.6%
Total	102	100.0%
Type of admission	N	%
Referred	74	72.5%
Self	28	27.5%
Total	102	100.0%
Registration Status with level of hospital	No of MNM	%
Unregistered	8	7.8%
Registered at PHC	37	36.3%
Registered at Tertiary care/ District	33	32.4%
Registered at Private	24	23.5%
Total	102	100.0%
No of ANC visits	No of MNM	%
None	1	1.0%
1 to 2	8	7.8%
3 to 4	32	31.4%
> 4	61	59.8%
Total	102	100.0%
Socioeconomic factors for MNM	No of MNM	%
Inadequate ANC visits, investigations & scans	41	40%
Delayed decision-making by patient	38	37%
Delay in reaching hospital	36	35%
No accessibility to hospital in a radius of 10 km	72	71%
Lack of transportation/ Money	18	18%
Inability to understand the problem	68	67%
Belief in a non-allopathic system	4	4%
Delay in referral	28	27%
Not attended by health professionals at a facility	2	2%
Lack of resources at the tertiary health facility	6	6%
No problems faced at the hospital	78	76%
Mode of Delivery	N	%
Vaginal	34	33.3%
LSCS	60	58.8%
Others (Abortions, Hysterotomy, Exploratory laparotomy)	8	7.8%
Total*	102	100.0%
Birth Status	N	%
Aborted	6	5.9%
IUD	12	11.8%
Live births	84	82.4%
Total	102	100.0%
Hospital stay	No of cases	Percentage
<7 days	0	0.0%
7 - 14 days	86	84.3%
>14 days	12	11.8%
>21 days	4	3.9%
Total	102	100.0%
ICU stay	No of cases	%
1-3 days	92	90.2%
4- 7 days	10	9.8%
>7 days	0	0.0%
Total	102	100.0%
Additional Interventions	**Required in MNM cases**	**%**
Inotrope support	12	11.8%
Mechanical ventilation	24	23.5%
Blood Transfusion	64	62.7%
Surgical interventions (compression sutures, Balloon tamponade)	18	17.6%
Surgical interventions- Obstetric Hysterectomy	7	6.9%

CAUSES OF MNM	**NO**	**%**
1. Haemorrhage		22.5%
Abortion, retained placenta, GTD	2	2.0%
Ectopic pregnancy, Hysterotomy	4	3.9%
Placenta Previa, Abruption	8	7.8%
PPH and intrapartum Bleeding requiring intervention	6	5.9%
Thrombocytopenia, blood disorders	2	2.0%
Uterine Rupture	1	1.0%
2. Hypertension Disorders		**40.2%**
Impending eclampsia	16	15.7%
Eclampsia (ante, intra, Postpartum)	21	20.6%
PRES	2	2.0%
HELLP	2	2.0%
3. Surgical causes		**9.8%**
Surgical causes (Trauma, bladder rupture, bowel perforation, cervical tear, paralytic ileus, perineal tear)	8	7.8%
Obstructed Labor	2	2.0%
4. Infection		**4.9%**
AFI related morbidity	1	1.0%
Sepsis & Septic abortion	4	3.9%
5. Medical		**22.5 %**
Severe Anemia	8	7.8%
Transfusion reactions	2	2.0%
Uncontrollable Diabetes	2	2.0%
AKI	2	2.0%
Heart diseases & Cardiomyopathy	3	2.9%
Respiratory involvement (pnemonia)	2	2.0%
Seizure disorder with convulsions	2	2.0%
DIC	2	2.0%

During my study period, a total of 102 cases of near miss were observed. During the same period, we had 14 maternal deaths. The Maternal near miss Mortality ratio was 7.3:1 while mortality Index (MD/ MNM+MD) was 12.06%. Mean age of the study group of

mothers was 25.7 years with 47.1% cases between age of 21 to 25 years.

Out of the total 102 cases, 47.1% were primigravida. A total of 8 near miss cases were of less than 20 weeks (7.8%), 23.5% were between 20-32 weeks, 37.3% were between 32 weeks till delivery while 17.6% and 13.7% were intrapartum and post-partum.

A total of 86.3% cases reside in rural areas. Majority cases were from lower or lower middle classes of socioeconomic classes. On education levels, 21.6% of the mothers were illiterate while 60.8% were educated up to primary level.

In the present study, majority of MNM cases were referred cases (72.5%). A total of 7.8% cases were unregistered during pregnancy while one-third were registered at PHC and tertiary care. Around 40% of mothers had inadequate antenatal checkups.

Major socio-economic factors for Probable MNM seen in the present study were: lack of accessibility of hospital in a radius of 10 km (71%), Inability of understand the problem (67%), Inadequate no of ANC visits, labs & scans (40%), Delayed decision making by patient (37%), Delay in reaching hospital (35%) and delayed referral (27%).

Most common etiology for maternal near miss was hypertension disorders (pre-eclampsia/ eclampsia/ PRES/ HELLP) contributing to 40.2% cases. This is followed by ante-partum and post-partum hemorrhage and medical complications like anemia, heart disease, AKI, GDM and transfusion reactions (22.5%). Surgical causes like trauma to bladder/ visceral perforations/ tears were seen in 9.8% cases while sepsis and AFI was observed in 4.9% cases. LSCS was required in 58.8% cases while one third cases delivered vaginally. Live birth happened in 82.4% cases while IUD in 11.8% abortion rate was 5.9%. Most of cases had hospital stay between 7 to 14 days (84.3%). ICU stay was seen for 1 to 3 days in 90.2% cases. Blood Transfusion was done in 62.7% cases. Mechanical ventilation and Inotropic support were required in 23.5% and 11.8% cases while surgical interventions and obstetric hysterectomy was required in 17.6% and 6.9% cases respectively

DISCUSSION:

During the research period, there were approximately 102 near miss mortality cases, resulting in a Maternal Near Miss Mortality Ratio (MNMR) of approximately 7.3:1. The study took into consideration factors such as age, literacy status, place of residence, socioeconomic-demographic profile of the patient, antenatal care, parity, mode of delivery, cause of maternal near miss and interventions adopted. The analysis also considered any delays in reaching the tertiary care centre from the primary care centre.

Both maternal deaths and near miss represent similar pathological and circumstantial factors leading to adverse maternal outcomes. In the present study too, we observed that main pathologies causing the maternal death are the same as what causes maternal near-miss i.e. hypertensive disorders of pregnancy and haemorrhage. Characteristics of affected patients are that they come from rural areas and have poor knowledge and poor pregnancy surveillance. No accessibility of hospitals in nearby vicinity, lack of transport, delayed referral, and delay in reaching hospital are some of the common socio-economic factors identified among near miss cases.

Developing protocols to prevent and manage high risk pregnancies and it's complications, training obstetricians to manage infrequent but fatal conditions like sepsis, ensuring the availability of emergency obstetric care in remote setups and defining a referral and transport system to mobilize critically ill women to higher centres for advanced care are a few suggestions based on our study findings. Timely referral after first line therapy would play a very important role in risk mitigation and prevention.

Establishment of Obstetric Critical Care Units with a multispecialty team approach to care, availability of prompt blood bank facilities and ventilator support should be mandatory in first referral units and a coordinated multispecialty critical care team care should be available in tertiary hospitals. Maternal NEAR MISS AUDIT meetings should be conducted monthly along with Maternal death review meetings.

CONCLUSIONS

Present study showed that common etiologies observed in maternal near miss cases were hypertensive disorders and ante-partum and post-partum hemorrhage. Affected patients come from rural areas, have poor knowledge and poor pregnancy surveillance. No accessibility of hospital in nearby vicinity, lack of transport, delayed referral, and delay in reaching the hospital are some of the common socio-economic factors identified among near miss cases.

The addition of near miss audits allows the care of critically ill women to be analyzed, deficiencies in the provision of care to be identified, and comparisons within and between institutions and countries to be carried out over time. This will, ultimately, improve the quality of obstetric care and further reduce maternal morbidity and mortality.

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