

Severe Acute Maternal Morbidities (SAMM) or Maternal Near Miss (MNM): Importance of Evaluation to Improve Maternal Health

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Abstract

Background: Severe acute maternal morbidity (SAMM) also known as maternal near miss (MNM) is defined as "Any woman who nearly died but survived as a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy". For adequate evaluation of maternal health, all these cases should be included in analysis. Aims and objectives of this study were to analyze the cases of severe acute maternal morbidities with regards to aetiology and management.

Methods: This prospective analytical study was conducted from March 2017 to August 2018. Cases of SAMM according to WHO criteria were included in the study. The data were analysed using Microsoft excel spreadsheet and SPSS software. Descriptive statistics had been used in the analysis and data had been presented as frequencies, ratios and percentages.

Results: There were 14070 Obstetric admissions, 11560 live births, 248 cases of SAMM/MNM and 38 maternal deaths (MD) during the study period. MNM ratio (MNMR) was 21.45 per 1000 live births (MNMR/LB). Obstetric hemorrhage was the leading cause (37.9%) followed by hypertensive disorders of pregnancy (34.27%). Most common intervention was transfusion of blood components (63.30% cases). Majority of cases (69.35%) required 7-14 days of hospital stay. Neonatal outcome was poor-stillbirth occurred in 13.76% cases and 32.08% babies required NICU admission.

Conclusion: Severe Obstetric morbidities can be prevented if they are diagnosed and managed at early stage. Review of MNM cases can greatly help to improve maternal health and to reduce maternal mortality.

Keywords: Maternal near miss; Severe acute maternal morbidity; Maternal mortality.

Introduction

Health of a women reflects health of a family and hence the nation. Complications can occur at any time during pregnancy and child birth. If not managed in time, it can lead to maternal mortality or morbidity [1,2,3]. For every woman that dies, many survive a pregnancy complication and suffer a long term/short term disability. Maternal mortality is just the tip of an ice berg. There is a vast base to this ice berg which is maternal morbidity, which can be mild or severe [4,5,6]. For adequate evaluation of maternal health, all these survivors should also be included in analysis in addition to maternal death review (MDR). Severe Acute Maternal Morbidity (SAMM) also known as Maternal Near Miss (MNM) is relatively new in maternal care and has been proposed as a supplementary indicator for monitoring the quality of maternity care. WHO has defined MNM as "Any woman who nearly

died but survived as a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy" [1,4,7,8]. Global prevalence of SAMM cases varies from 0.01-8.23%. SAMM cases require urgent medical intervention in a tertiary care centre to prevent mortality [1,4,9,10].

Aims and objectives of this study were to analyze the cases of severe acute maternal morbidities with regards to aetiology and management.

Materials and Methods

This prospective analytical study was conducted in the department of Obstetrics and Gynecology, Surat Municipal Institute of Medical Education and Research (SMIMER) from March 2017 to August 2018. Permission from institutional ethics committee was taken prior to conducting the study. Cases of SAMM according to WHO criteria were included in the study. Direct information was noted in WHO defined proforma from woman herself after stabilization of her condition. Data included sociodemographic factors, obstetric history, disease responsible for SAMM, complications that prompted ICU admission, required intervention, length of hospital stay, treatment given and final outcome. The data were analysed using Microsoft excel spreadsheet and SPSS software. Descriptive statistics had been used in the analysis and data had been presented as frequencies, ratios and percentages. Severe maternal outcome ratio, near miss: mortality ratio, mortality index, mortality: morbidity ratio and admission: morbidity ratio was calculated.

Results

There were 14070 Obstetric admissions, 11560 live births, 248 cases of severe acute maternal morbidities (SAMM) or MNM and 38 maternal deaths (MD) during the study period. MNM ratio (MNMR) was 21.45 per 1000 live births (MNMR/LB). Total woman with life threatening complication (WLTC=MNM+MD) was 286. Severe maternal outcome ratio (SMOR) was 24.74 per 1000 live birth (MNM+MD/LB) i.e. 24.74 women suffered from life threatening condition per 1000 live birth. Maternal near miss mortality ratio was 6.52 (MNM/MD).

As shown in table 1, 51.61% women belong to 21-30 years of age, 15.32% were less than 20 years of age. Majority of women (68.14%) belong to below poverty line. Only 2.82% women had graduated;

52.42% women were illiterate and 25.81% were studied up to 5th standard. More SAMM cases were noted in the parity group 2-4. 58.47% women had not taken any form of antenatal care. Table 2 shows main causes of severe morbidities. Obstetric hemorrhage was the leading cause (37.9%) followed by hypertensive disorders of pregnancy (34.27%). 25.8% women had PPH and 25.4% had eclampsia. Among the medical disorders, viral hepatitis (11.3% cases) was the leading the cause. Severe sepsis leading to septic shock occurred in four cases. Majority of women (81.85%) were admitted in severe moribund condition (Table 3). Table 4 shows various interventions required to save the severe cases. Many cases required one or more interventions. Most common intervention was transfusion of blood components (63.30% cases) in complications like severe hemorrhage and anemia. Ventilator support was required in 33.06% cases. 32.26% cases of severe preeclampsia-eclampsia required magnesium sulphate. Surgical interventions required in 29.84% cases. Severe morbidities require intensive care so hospital stay is prolonged. Majority of cases (69.35%) required 7-14 days of hospital stay (Table 5). Neonatal outcome was poor in cases with severe Obstetric complications. Stillbirth occurred in 13.76% cases. 32.08% babies required NICU admission for various indications, out of which 21 neonates died in NICU (Table 6).

Table 1: Characteristics of women with SAMM

Characteristics	Number (n=248)	Percentage (%)
<i>(a) Age (in years)</i>		
< 20	38	15.32
21-30	128	51.61
31-40	58	23.39
>40	24	9.68
<i>(b) Economic status</i>		
BPL (below poverty line)	169	68.14
APL (above poverty line)	79	31.86
<i>(c) Education level</i>		
Illiterate	130	52.42
Up to 5 th std	64	25.81
6 th to 12 th std	47	18.95
Graduate & above	7	2.82
<i>(d) Parity</i>		
1	95	38.30
2-4	130	52.42
5 or more	23	9.28
<i>(e) ANC visits</i>		
Yes	103	41.53
No	145	58.47

Table 2: Etiology of SAMM

Etiology	Number (n=248)	Percentage (%)
<i>(a) Obstetric hemorrhage</i>		
(1)Antepartum hemorrhage		12.10
Placenta previa	9	3.63
Abruptio placentae	13	5.24
Ectopic and abortion	8	3.23
(2) Postpartum hemorrhage		25.80
Atonic PPH	44	17.74
Traumatic PPH	20	8.06
<i>(b) Hypertensive disorders</i>		
Severe preeclampsia	22	8.87
Eclampsia	63	25.40
<i>(c) Medical disorders</i>		
Viral Hepatitis	28	11.30
Severe anemia	14	5.65
Others	10	4.03
<i>(d) Labor related disorders</i>		
Retained placenta	6	2.40
Rupture uterus	5	2.01
Inversion of uterus	2	0.81
<i>(e) Severe sepsis</i>		
Postpartum sepsis	3	1.21
Postabortal sepsis	1	0.41

Table 3: Condition at the time of admission

Condition at the time of admission	Number (n =248)	Percentage (%)
As near miss	203	81.85
With disorder become near miss	17	6.85
No disorder become near miss	28	11.29

Table 4: Interventions required

Interventions	Number	Percentage (%)
Blood components	157	63.30
Ventilatory support	82	33.06
Inj.Magnesium sulphate	80	32.26
Vasopressors	72	29.03
Repair of genital tract injuries	21	8.47
Peripartum hysterectomy	20	8.06
Uterine compression sutures	15	6.05
Hypogastric artery ligation	10	4.03
Manual removal of placenta	6	2.42
Dialysis	4	1.61
Reposition of inverted uterus	2	0.81

Table 5: Duration of hospital stay

Hospital stay	Number (n =248)	Percentage (%)
< 7 days	56	22.58
7–14 days	172	69.35
> 14 days	20	8.07

Table 6: Neonatal outcome

Neonatal outcome	Number (n=240)	Percentage (%)
Shifted with mother	130	54.16
Stillbirth	33	13.76
NICU admission	77	32.08
(a) Discharged	56	
(b) Died	21	

Discussion

Maternal mortality ratio (MMR) has declined dramatically worldwide and in India. MMR of India reduced by 77%, from 556 per 100,000 live births in 1990 to 130 in 2016. India has to achieve sustainable development goal (SDG) target of MMR below 70 by 2030 [1,3]. In last two decades, the concept of conducting a MNM review has gained importance as an additional strategy to maternal death review. Near misses/Severe acute maternal morbidities are relatively simpler to analyze and easier to resolve. This knowledge will help in identifying the contributory factors of maternal deaths so that actions can be taken at community and health systems level [1,2,4,9]. The review that captures the experiences of those pregnant women who suffered complications during pregnancy but survived a major fatality due to timely intervention provides a lot of learning opportunities, which is available more easily due to the availability of the mother as well as the willingness of health professionals who are eager to share their 'success' stories [1,9,10].

In our study, MNM ratio was 21.45 per 1000 live births which was comparable to study by Shrestha NS et al [6] and Singh A et al [10]. 68.17% women belong to below poverty line in our study while 82.95% women were below poverty line in the study by Umadevi S et al. [3]. Anemia, multiparity and infectious morbidities are more common in poor women. Also they have limited knowledge and access to maternity services. Same things apply to level of education.52.42% cases of SAMM were uneducated and 25.81 % were studied up to 5th std. Regular antenatal care is the most important factor in reducing morbidity and mortality. 58.47% of women did not receive antenatal care which is comparable to study by Purandare CN et al. [2]. Most common causes of SAMM were Obstetric hemorrhage and hypertensive disorders in our study which is comparable to other studies [2,5, 6,7,8]. In our study, 63.30% cases required blood components transfusion which is comparable to study by Umadevi S et al. [3]. 86% cases required blood components transfusion in study by Purandare CN et al. [2]. Severe cases require

prolonged hospitalization for recovery. Majority of cases (69.35%) required 7–14 days of hospital stay in our study which is comparable with other studies [4,5,6]. Poor neonatal outcome in SAMM cases is attributed to prematurity, maternal hemodynamic instability etc. Still birth occurred in 13.76% cases in our study which was 13.70% in Yelikar KA *et al.* [5] study and 15.9% in Umadevi S *et al.* [3] study. NICU admission in our study was comparable to Yelikar KA *et al.* study [5].

Conclusion

Severe Obstetric morbidity and its relation to mortality may be more sensitive measures of pregnancy outcome than mortality alone. Severe Obstetric morbidities can be prevented if they are diagnosed and managed at early stage. Uniform training of the medical and paramedical staff involved in maternal care throughout the country is very important. Review of MNM cases can greatly help to improve maternal health and to reduce maternal mortality.

References

1. Maternal near miss review: Operational Guidelines, Dec 2014, Maternal Health Division, Ministry of Health & Family Welfare, Govt. of India. www.mohfw.gov.in.
2. Purandare CN, Bhardwaj A, Malhotra M, *et al.* Maternal near-miss reviews: lessons from a pilot programme in India. BJOG. 2014;121(Suppl. 4):105–111.
3. Umadevi S, Ayesha S, Radha S, *et al.* Burden and causes of maternal mortality and near-miss in a tertiary care centre of Kerala, India. Int J Reprod Contracept Obstet Gynecol. 2017;6:807–13.
4. Sarma HKD, Sarma HK, Kalita AK. A prospective study of maternal near-miss and maternal mortality in FAAMCH, Barpeta; with special reference to its aetiology and management: First 4 months report. J Obstet Gynecol Barpeta. 2014;1(2):100–6.
5. Yelikar KA, Deshpande SS, Deshmukh SF. Severe acute maternal morbidity in a tertiary care centre with basic intermediate respiratory care unit setup. Int J Sci Stud. 2015 Aug;3(5):36–40.
6. Shrestha NS, Saha R, Karki C. Near miss maternal morbidity and maternal mortality at Kathmandu medical college teaching hospital. Kathmandu Uni Med J. 2010;8(2):222–26.
7. Vandecruys HI, Pattinson RC, Macdonald AP. Severe acute maternal morbidity and mortality in the Pretoria Academic Complex: changing patterns over 4 years. European J Obst Gynecol. 2002;102(1):6–10.
8. Filippi V, Ronsmans C, Gohou V. Maternity wards or emergency obstetric rooms? Incidence of near-miss events in African hospitals. Acta Obstet Gynecol Scand. 2005;84(1):11–16.
9. Rathod AD, Chavan RP, Bhagat V, Pajai S, Padmawar A, Thool P. Analysis of near-miss and maternal mortality at tertiary referral centre of rural India. J Obstet Gynecol Ind. 2016 Sep-Oct;66(S1):S295–S300.
10. Singh A, Shrivastava C, Dube S. Maternal near miss: A valuable contribution in maternal care. J Obstet Gynecol Ind. 2016 Sep-Oct;66(S1):S217–S222.