Prospective Study of Maternal Near Miss Cases.

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Abstract
INTRODUCTION: *Despite therapeutic advances during this century and a growing perceptionof thesafety of childbirth, morbidity and mortality continue to occur in obstetric patients.NEAR MISS refers to women who experienced andsurvived a severe health condition during pregnancy, childbirth and postpartum. ANEAR MISS case refers to the situation where a woman suffered a severe complication,and she nearly died but survived because of good health care she received or sheergood luck.* ***MATERIAL & METHODS***: *It was aprospective study of maternal near miss cases in tertiary healthcare system. Study population were 75 near miss cases who fitted in the WHO nearmiss tool proforma.* ***RESULTS*** : *In this study 82.7% of near miss cases were in late pregnancy(more than 28 weeks), 69.35% patients belongs to below poverty line ,61.2% near miss cases were multigravida while 38.6% were primi gravida ;44% came directly to the hospital and 56% were referred from healthfacilities , 53.3% were near miss at the time of arrival and majority of thisgroup had hypertensive disorders of pregnancy as the adverse event ;46.6% became near miss after admission to the hospital , the mostcommon adverse event in this group was hemorrhage .* ***CONCLUSIONS***: *Lessons can be learnt from near miss cases which canserve as a useful tool for reducing maternalmortality. Near miss analysis isworth presenting in indices as a surrogate for maternal death. Need fordevelopment of an effective audit system for maternal care which includesboth near miss obstetric morbidity and mortality is felt.*
Key Words: *Maternal near miss, hypertensive disorders of pregnancy,obstetric- hemorrhage*

I.   Introduction

Despite therapeutic advances during this century and a growing perception of thesafety of childbirth, morbidity and mortality continue to occur in obstetric patients.More than one woman dies every minute from such causes;585,000 women dieeach year. In addition to maternal death, women experience more than 50 millionmaternal health problems annually. As many as 300 million women experience morethan one-quarter of all adult women living in the developing world currently suffer fromshort of long term illness and injuries related to pregnancy and childbirth.In a resource-poor setting, maternal mortality is an important health indicator ofthe country. Pregnant women health status is not reflected by mortality indicators alone;hence, the concept of near-miss is apt for the present health providing system[1,2].

In many developed countries, maternal mortality has fallen to single digits,whereas near-miss cases are more and hence useful in the evaluation of the presentsystem.Recentdata has shown that obstetrics near-miss cases or more frequent than deaths, can,therefore, supplementinvestigations of maternal mortality.

For improvement of maternal deaths, it is essential to identify the failure withinthe system and to take the corrective action.The terminology "NEAR MISS" has been borrowed from the airline industry.Stones et al. were the first to use the term "near-miss morbidity" to define anarrow category of morbidity encompassing "potentiality life-threatening episodes"[3].

In obstetric literature, NEAR MISS refers to women who experienced andsurvived a severe health condition during pregnancy, childbirth and postpartum. ANEAR MISS case refers to the situation where a woman suffered a severe complication,and she nearly died but survived because of good health care she received or sheergood luck[4-5].

The investigation of near-miss provides better information about disease burdenand quality of health care provided to women. It also helps in understanding contributingfactors to both maternal morbidity and mortality.This study is a prospective study to analyse maternal near-miss morbidity intertiary health care in a

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local setting. Purpose of the study is to investigate variouscauses of near-miss and their incidence and the quality of health care provided.

II.   Material & Methods

Study setting:
The study was conducted in the Department of Obstetrics andGynecology, GGH, Guntur, Andhra Pradesh, India which is a tertiary carecentre and serves as a referral centre for other primary health care centres andprivate hospitals of Andhra Pradesh.
Study period:
This study was done for a period of 23 months between November 2017 toOctober 2019.

Study Design:
This study was a prospective study of cases with severe obstetricmorbidity were identified and followed during the hospital stay until theirdischarge or death. For each case of near miss data were collected ondemographic characteristics including patient age, socioeconomic status, parity,whether came directly or referred from outside hospitals, gestational age at thetime of sustaining the near miss morbidity, nature of obstetric complications,presence of organ system dysfunction or failure, ICU admission and timing ofnear miss event with respect to admission, neonatal outcome. Those who did notsurvive were not included in the study.
Study Population
Seventy-five cases were studied based on the criteria fitted in the WHOnear miss tool proforma.

INCLUSION CRITERIA
a) Severe maternal complications
1. Severe preeclampsia
2. Eclampsia
3. Sepsis or severe systemic infection
4. Ruptured uterus
5. Severe complications of abortion
b) Critical interventions or intensive care unit use
1. Admission to an intensive care unit
2. Interventional radiology
3. Laparotomy (Hysterectomy)
4. Use of blood products
c) Life-threatening conditions
1. Cardiovascular dysfunction
2. Respiratory dysfunction
3. Renal dysfunction
4..Coagulation / haematological dysfunction
5. Hepatic dysfunction
6. Neurological dysfunction
7.Uterine dysfunction

EXCLUSION CRITERIA:
1.A woman after 42 days of termination of pregnancy
2.Maternal deaths
Data Analysis:
Data were entered into a computer database using Microsoft Excelspreadsheet, and statistical analysis was performed, using SPSS version 16.

III.   Results:

During the period of study, outpatients (obstetrics alone)patients 76,769 received care in the OP of whom new outpatient25,912, old outpatient 50,857.In patients admitted and treated 8,209.The number of deliveries of which labour normal 10,365; assisted419; LSCS 7,895 and live births 18,265.

In this study, the total number of near miss cases were 75. Parity wise distribution showed that the number of primigravida were 29 and multigravida 46.The number of multigravida with previous LSCS were 17.The total number of maternal near miss cases in early pregnancy<28wk were 13 and in late pregnancy 62.
Status of the baby at birth: Total number of live born were 55; dead born were 10 and ectopics and abortions were 10. The number of pre-terms born in near miss cases were 31.
The number of eligible near misses cases received corticosteroidtherapy were 22.

Socio Demographic Characteristics: Majority of the case (n=65; 86.7%) of the near miss case belonged to 20-30 years age group and more than two thirds (n=52; 69.3%) were from Below poverty line (BPL).

More than one thirds (n=29; 38.6%) of the near miss cases were Primi followed by second gravida in one fourth (n=19; 25.3%) and third gravida (n=16; 21.3%). The number of multigravida with history of previous LSCS were 17. With regards to referral status, more than half the cases (n=42; 56%) were referred cases. Cases near miss at arrival were 40 (53.3%) and after admission 35 (46.7%). Most of the near miss cases at arrival are hypertensive disordershaemorrhage and ruptured ectopic pregnancy.Near miss cases after admission are mainly placenta praevia,severe preeclampsia and eclampsia cases.

Distribution of Near miss cases as per Gestational age showed that the number of cases in early pregnancy < 28 weeks were 13 and in late pregnancy (>28 weeks) 62. Mean gestational age was 31.84 ±10.43.

Mean duration in days from the time of admission to termination orlaparotomy in MNM cases which require active intervention orimmediate termination was 1.56 days and the mean duration of hospital stay was 10.19 days.

Mode of delivery: The number of vaginal deliveries in near miss cases were 27 and LSCS done 36 cases.The number of emergency laparotomies in near miss cases forEctopic pregnancy and ruptured uterus were 11. In one case vacuum aspiration for molar pregnancy was done.

The leading cause for a near miss is mainly due to hypertensive disordersfollowed by obstetric haemorrhage. The most common organ dysfunction seen was coagulation/haematologic dysfunction.

Table 1: Underlying causes for near miss

Underlying causes	Number (n=75)	Percentage
Pregnancy with abortive outcome	10	13.3
Obstetric haemorrhage	16	21.3
Hypertensive disorders	40	53.3
Other obstetric disease or complication	01	1.3
Medical/surgical/mental disease orcomplication	15	20

Table 2: Organ dysfunction in maternal near miss cases

Organ dysfunction in maternal near miss cases	Number (n=75)	Percentage
Coagulation/haematologicdysfunction	23	30.6
Cardiovascular dysfunction	11	14.6
Respiratory dysfunction	09	12
Renal dysfunction	05	6.6
Neurologic dysfunction	05	6.6
Hepatic dysfunction	02	2.6
More than one organ systeminvolved	05	6.6

Contributory causes and associated conditions in maternal Near miss cases: The most common contributory and associated condition was Anaemia (n=59; 78.7%) followed by previous caesarean section (n=17; 22.7%). Other causes were HIV/Infections, prolonged/obstructed labour in 2 cases each. Near miss cases with dystocia are less because of good monitoring of theprogression of labour with the partograph and active intervention was takenimmediately when needed.

Severe postpartum haemorrhage (n=31; 41.3%) and severe pre-eclampsia (n=30, 40%) were the most common severe complications associated with Near miss in the present study.

Critical Interventions in Maternal Near Miss Cases: Use of blood products in 63 maternal near miss cases, Re-laparotomies in case of PPH in 3 and Admission into ICU (intensive care unit) in 34 cases.Since it is a tertiary care Hospital super-speciality care like coronary,nephrology, neurology is available and maternal near miss cases are transferred,as per the requirement of treatment.

Table 3: Critical Interventions In Maternal Near Miss Cases

Women undergoing critical interventions	Number (n=75)	Percentage
Use of blood products	63	84
Laparotomy	03	4
Admission to intensive care unit	34	45.3

Treatment Of Severe PPH: For all PPH cases, oxytocin, misoprostol and other uterotonics and tranexamicacid are given as per the requirement. Balloon or condom tamponade in 13Abdominal packing in 1 and Artery ligation (uterine / internal iliac artery) in 14 cases was done.
Life-saving surgical interventions to control haemorrhage were required in14 cases, and stepwise devascularisation was done as per the requirement ofthe treatment.

Treatment of severe pre-eclampsia and eclampsia:Intravenous labetalol and anticonvulsants were given for all eligible caseswhich required treatment and monitored in high dependency unit(HDU).

Prevention of caesarean section related infections :Prophylactic and therapeutic parenteral antibiotics for three days postoperativelywere given during Caesarean section and laparotomy to preventinfection. Thus the near miss cases with sepsis were less.

IV. Discussion

All over the world, the majority of the women in the prime of the youth areexposing to the risk of pregnancy and associated morbidities.In this study, most of the maternal near miss cases are from below povertyline.From this, we can infer that the majority of the maternal near miss casesbelongs to below poverty line and are more vulnerable to the pregnancyrelatedmorbidities — early registration, along with health educationregarding nutrition, warning signs of pregnancy and regular antenatalcheckups.

In this study majority of the near miss cases were multigravida about 61.2%(n = 46) , primigravida were 38.6% (n = 29).Possible causes for the maternal near miss cases in multigravida may bedue to previous bad obstetric history, previous caesarean sections, lessinterpregnancy interval, social factors like poverty, malnutrition.The most common cause of maternal near miss washypertensive disorders 53%, followed by obstetric haemorrhage 21.3%,medical-surgical diseases 20% and pregnancy with abortive outcome13.3%.In this study, 46.6% of patients became near miss after admission to thehospital, the most common adverse event in this group was haemorrhage.

Study by Jain U[6] found the mostcommon morbidity was (30.18%) hypertensive disorder of pregnancy. These 159 near miss diagnoses were comprisedof (30.18 %) cases of Hypertensive disorder of pregnancy, (27.67%) cases of major obstetric hemorrhage, (6.91)Severe systemic infection or sepsis, (4.40%) Labour related disorders. In Medical disorders very Severe Anemia,(1.88%) was most common cause of near miss. The most common cause of death was post-partum hemorrhage 37.5%and most of the patients referred from periphery in very critical condition. The median time taken to get clinicalintervention among cases was 20-40 minutes after admission.

Another study by Mansuri F, Mall A[7]observed that severe maternal outcome cases were 326, of which 247 (75.8%) were of MNM cases and 79 (24.2%) were of MD. MNM mortality ratio was found to be 3.13:1. Eclampsia (29.45%) followed by preeclampsia (25.46%) and severe postpartum hemorrhage (22.39%) were the leading causes of potentially life-threatening conditions.

Upadhyaya andChaudhary, Moracs et al, and Huseyin et al, also reportedthe hypertensive disorder in pregnancy as leading causeof maternal illness.[8-10] Also, the Study by Souza JP et al,had incidence of severe preeclampsia in 36.3%,Eclampsia 9.7%, HELLP syndrome 5.6%. severehemorrhage 10.5%, severe sepsis 6.4%[11].

Author study was not comparable with study of WhileTaly et al and Roost et al, they reportedhemorrhage 60% and 48% as most commoncause of SAMM (near miss) respectively.[11,12]

With regards to Critical interventions, Use of blood products noted in 84% for near miss cases and admission to ICU 45.3%. As most of the near miss cases were anaemic, the use of blood productswas high in this study.Majority of the cases are admitted in ICU for ventilator support and are withhypovolaemic shock.

In present study, 71% corticosteroid coverage done in the eligible casesfor this type of treatment.For most of the eligible cases, corticosteroid coverage was done atthe public health centres and private hospitals before referring to thishospital.

In this study, perinatal deaths were 13.3%, where as in Jain U study[6], during the study period 8 patients were died, out ofwhich 3 (37.5%) patients were died due to PPH. Perinatal deaths in this study are less due to good monitoring of theprogression of labour with the partograph, and active intervention wastaken because of fetal distress, and corticosteroid coverage was done inthe majority of the eligible cases which required the treatment.

V. Conclusions:

In this study, Hypertensive disorders and Hemorrhage and are the leadingcauses of near miss situations. Anaemia and previous LSCS seem to be riskfactors for developing maternal near miss.The quality of care received by critically ill Obstetrics patients in this centre isoptimal for near miss events like haemorrhage and anaemia.

In tertiary care hospital, it is possible to save most of the patients presenting withlife-threatening conditions by adopting an evidence-based protocol, trainingpersonnel, improving the resources and multidisciplinary approach for managingsevere morbidities. The overall reduction in maternal mortality can be achievedby improving the antenatal care and timely referral of cases to the tertiaryhospital and thus aiming to meet the sustainable development goal

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