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ROLE OF THREE DELAYS IN SEVERE ACUTE MATERNAL MORBIDITY

Gynaecology

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ABSTRACT

Aim- To identify the near miss cases and to assess the reasons for delay in receiving appropriate emergency care.
Materials and methods - WHO 2011 criteria was used for identification of near miss cases. Data collection was done by interview of patients and relatives through pretested questionnaire.
Results- In the study period of one year, there were 74 near miss cases. 85.1% of the cases had one or more types of delays. 48.6 % of the women had delay type I delay, followed by combined type I and II delays in 21.6% of the cases. Type II delay was seen in 12.2% of the cases. Type III delay in receiving adequate treatment was seen in 2.7%.
Conclusion - Lack of awareness in the common population about the complications of pregnancy in spite of high literacy rates has been found to be the major factor in causing delay in availing treatment. It is important to join hands to educate the general population to bring about a major change in the health of women.

KEYWORDS

SAMM, Delays, WHO criteria

Background

Even though India has succeeded in reducing the maternal mortality ratio by 77 % from 556 per 100 000 live births in 1990 to 130 per 100 000 live births in 2016, the millennium development goal target has not been achieved. It is important to strive to achieve the sustainable development goal target of an MMR of 70 by 2030. Kerala is a small state in India which is spread over 38,863 KM square with a population of 33.3 million. The state has a literacy rate of 93.91% with maternal mortality ratio of 46 / 100 000 live births in 2016 which is the lowest in India (1). In spite of having a high literacy, low fertility and high rates of institutional deliveries, the MMR has remained relatively high with no significant improvement in recent years (2). This study on three levels of delay was conducted to assess the issues in obstetric care so that interventions can be made to reduce maternal mortality further.

Introduction

Approximately 830 women die every day from preventable causes related to pregnancy and child birth (3). The global effort of reducing maternal mortality by 75 % by 2015 from 1990 level, which was the goal number 5 in the millennium development goals, has helped in making a progress towards reducing maternal mortality. As a part of sustainable development, WHO has set a target is to reduce the global maternal mortality ratio to less than 70 /100,000 live births between 2016 and 2030(3).

Health status of pregnant women was reflected by mortality indicators but women who survive severe complications during pregnancy, childbirth and postpartum period could help us in better understanding of the conditions and preventable factors that contribute to maternal death. Hence the concept of maternal near miss was introduced.

In 2008, WHO came with a standard definition for severe acute maternal morbidity that includes clinical, laboratory and intervention based criteria (4). In 2011, WHO revised this criterion and comes with a new concept to identify near miss cases that includes mainly five severe maternal complications and life threatening conditions associated with them (5).

. Many women reach health facility in a poor condition that they cannot be saved. The time taken to receive adequate care is the key factor in their deaths. As every minute can make a difference between life and death, the concept of three delays model was introduced. (6). It proposes that pregnancy related mortality is increased due to delays in (1) Deciding to seek appropriate medical help for an obstetric emergency. (2) Reaching an appropriate medical facility. (3) Receiving adequate care when the facility is reached (7, 8)

There are several factors that that can contribute to each delay. The first two delays are caused by socioeconomic, cultural and political factors, whereas the third delay is caused by inadequacies in the health system (7).An analysis of the time delay helps to reduce the incidence and case fatality of severe obstetric complications.

Sree Avittom Thirunal hospital is the maternal and child facility attached to Government Medical College, Trivandrum, Kerala, India which is the major referral tertiary centre in southern part of Kerala. This study was conducted in this tertiary centre to identify the delays which results in maternal near miss cases so that the relevant information can be used to improve the obstetric care services and to further reduce maternal mortality ratio.

Materials and methods

Aim: - to identify the near miss cases/ severe acute maternal morbidity cases and to assess the reason for delay in receiving appropriate emergency care.

Study design: Cross sectional study

Study setting: - Department of obstetrics and gynecology, Sree Avittom Thirunal Hospital, Government Medical College, Trivandrum.

Study population: - All antenatal and postnatal patients within 42 days of delivery who come under the definition of SAMM cases and who fulfill WHO criteria, 2011 for near miss.

Study period: – 1 year. From March 2016 to February 2016.

Data collection: - By in depth interview of patients and relatives, through pretested questionnaire.

Inclusion criteria:-WHO 2011 criteria was used for identification of near miss cases that included mainly five severe maternal complications and life threatening conditions associated with them .

These five maternal complications are:
1. Severe postpartum hemorrhage
2. Severe preeclampsia and Eclampsia
3. Sepsis or severe systemic infections
4. Rupture uterus
5. Severe complications of abortion

Eligibility is not restricted by gestational age at which complications occurs.

Delays for getting proper care was assessed using “3 delays model”.

Exclusion criteria: - morbidity from accidental or incidental causes like accidents and suicide were not included in the study.

Ethical clearance: - ethical clearance was obtained from Human Ethics Committee Medical College,

Trivandrum.

Data analysis: - qualitative variables were expressed in frequency distribution and quantitative variables were described in mean SD, minimum and maximum. Data was entered in Microsoft excel and data analysis was performed using SPSS version 17.0.

Results

In this one year period, total number of deliveries were 10680, total babies were 11082, 10886 live births, 16 maternal deaths and 74 near miss cases. Maximum numbers of patients belonging to near miss category were in the age group of 26-30 years and 70 % were not working without any income on their own.

Table I
Demographic and obstetric characteristics of study population

Demographic and obstetric		
Characteristics	cases (n)	percent (% of n)
Age of the woman		
<25	21(6552)	28.4(61.33)
26-30	27(2601)	36.5(25.34)
31-35	20(1164)	27 (10.89)
36-40	06(34)	8.1 (3.19)
>40	0(22)	0 (0.2)
Occupation		
Working	22	29.7
Homemaker	52	70.3
Parity		
Primigravida	27(5585)	36.5(52.59)
Para 1	35(3781)	47.3(35.37)
Para 2	10(1012)	13.5(9.47)
Para 3	2(196)	2.7(1.83)
Para 4	0(103)	0(0.96)
Previous caesarean		
No	42	56.8
Previous 1 cs	23	31
Previous 2 cs	8	10.8
Previous 3 cs	1	1.4
Time of presentation		
Antenatal	52	70.2
Intrapartum	13	17.6
Postnatal	9	12.2
Gestational age of presentation of AN patients		
<34 wks	42	64.6
>36wks	10	15.4
34-36 wks	13	20
Booking status		
Booked	2	2.7
Not booked	7	9.5
Booked outside	65(2975)	87.8(27.8)

NB: (n represents total number of women delivered in the category)

36.5 % were primigravida and the rest were multigravida with maximum number of near miss cases in women who had second pregnancy. 87.8 % of patients were in the antenatal period at the time of admission with 20% of the antenatal patients in labour. 64.6 % of the antenatal patients were below the gestational age of 34 weeks. 9.5 % of the patients were not booked. 97.3 % of the women who satisfied the near miss criteria were referred from other hospitals to our facility. 66.2 % of the women had onset of complications at home and 90.5 % of the women were referred from one centre but 4 of them (5.4 %) came after being referred from 2 centers and one patient had history of three referrals. 43.2 % of the women had history of previous caesarean section.

Table 2 Co morbidities

Hypertensive disorders	42 %
Thrombocytopenia	38 %
DIC	31 %
Abruption	24%
Gestational diabetes	18%
Jaundice	14%

Most common co morbidity associated with the current pregnancy was hypertensive disorders of pregnancy followed by thrombocytopenia. Caesarean section was the mode of termination of pregnancy in 64.8 % patients, 28.4 % underwent vaginal delivery and 6.7 % underwent laparotomy for ectopic pregnancy. Among the 28.4 %women who underwent vaginal delivery, 62 % had spontaneous vaginal delivery while 38 % were induced. There were 9 cases of post partum hemorrhage among the total near miss cases of which 7 were atonic postpartum hemorrhage.

85.1 % of the cases had one or more types of delays. 48.6 % of the women had delay in seeking medical care (type I delay), followed by combined type I and II delays in 21.6 % of the cases. Inability to judge the seriousness of the problem, waiting for the problem to resolve itself and lack of deciding person were the major causes of type I delay. Delay in accessing adequate care was seen in 12.2 % of the cases (type II delay). Major reasons were lack of deciding person and lack of an accompanying person. Type III delay in receiving adequate treatment was seen in 2 patients (2.7 %) of which both cases were associated with type I delay. These were due to delay in surgery due to non availability of theatre. There was no delay in 14.9 % of the cases

Types and characteristics of delays among the women identified as near miss cases

First phase delay	frequency	percentage
No delay	20	27
≤ 24 hrs	41	55.4
>24 hrs	13	17.6
Second phase delay		
No delay	49	66.2
≤ 6 hrs	20	27
6-12 hrs	02	2.7
12-24 hrs	02	2.7
>24 hrs	01	1.3
Third phase delay		
No delay	72	97.3
1 hour	02	2.7

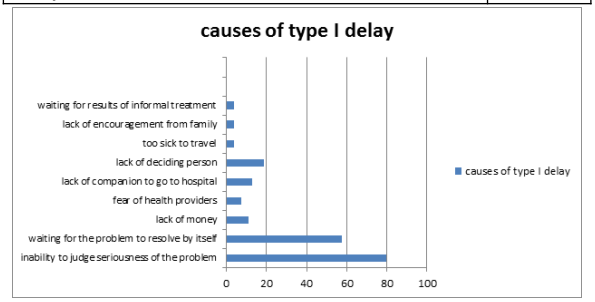
Types of delay

Types of delay	frequency	percentage
No delay	11	14.9
Type I	36	48.6
TYPE II	9	12.2
Type I + II	16	21.6
Type I + III	2	2.7

Causes of first delay

Causes of first delay	Frequency
Inability to judge the seriousness of the problem	09
Inability to judge the seriousness of the problem + waiting for problem to resolve by itself	16
Inability to judge the seriousness of the problem + waiting for problem to resolve by itself + fear of hospital and health providers	02
Inability to judge the seriousness of the problem + waiting for problem to resolve by itself + lack of companion to go to the hospital	01
Inability to judge the seriousness of the problem + waiting for problem to resolve by itself + lack of deciding person	02
Inability to judge the seriousness of the problem + waiting for problem to resolve by itself + too sick to travel	01
Inability to judge the seriousness of the problem + lack of money	04
Inability to judge the seriousness of the problem + lack of money + lack of deciding person	01
Inability to judge the seriousness of the problem + lack of companion to go to the hospital	02
Waiting for problem to resolve itself	01
Waiting for results of informal treatment +lack of money + lack of deciding person	01
Waiting for problem to resolve itself+ lack of companion to go to the hospital	04
Waiting for problem to resolve itself + too sick to travel	01

Waiting for problem to resolve itself + Lack of encouragement from the family	01
Waiting for problem to resolve itself + fear of hospital and health providers	01
Fear of hospital and health providers + lack of deciding person	01
Deciding or accompanying person not available	04
Lack of companion to go to the hospital + Lack of deciding person	01
Lack of deciding person + lack of encouragement from family	01



Causes of second delay

Causes of second delay	Frequency
No specific cause	4
Fear of hospital and health providers	1
Lack of transportation + deciding or accompanying person not available	2
Deciding or accompanying person not available + lack of roads or poor conditions of roads 1	
Fear of cost and distance	3
Fear of cost and distance + deciding or accompanying person not available	1
Fear of cost and distance + financial problems	1
Deciding or accompanying person not available	3
Fear of hospital and health providers + deciding or accompanying person not available	1
Deciding or accompanying person not available+ financial problems	1
Financial problems	1
Late referral	4
Deciding or accompanying person not available + late referral	1
Multiple referrals	1

Decision maker in seeking medical care

Husband	63 .5 %
Parents	3.1 %
In laws	21.6 %
Others	6.8 %

Delay in third phase

Non availability of the theatre	02

Discussion

At least one type of delay was noted in 85.1 % of the near miss cases.

In this one year period, total number of deliveries was 10680, 10886 live births, 16 maternal deaths and 74 near miss cases. So mortality index in this study is 0.17 and maternal near miss mortality ratio was 4.6: 1. This indicates that one woman died for almost every 5 women who survived severe morbidity. In a study done in Manipal, Karnataka, India, the ratio was 5.6: 1. It was 7:1 in a study conducted in Nigeria while it was 1: 117-223 in a study done in Europe (9, 10,11).

Maximum numbers of patients belonging to near miss category (36.5 %) were in the age group of 26-30 years which was different from the study done in Myanmar where the maximum number of near miss cases belonged to 36-40 years (12). 70 % were not working without any income on their own, which showed financial dependency which was similar to the study in Myanmar (12). 90.5 % were booked in a health facility with 86.5 % having regular antenatal visits. This finding was similar to the study conducted in Myanmar in which maximum number of women had regular antenatal visits while in Pakistan most of the patients (90 %) did not have regular antenatal care (12, 13). 63.5 % of the near miss cases were multiparous women which were similar to the results conducted in studies done in Assam, India and in Wayanad, India (14, 15)

97.3 % of the women who satisfied the near miss criteria were referred from other hospitals to our facility. 90.5 % of the women were referred from one centre but 4 of them (5.4 %) came after being referred from 2 centers and one patient had history of three referrals. 52.7 % of the patients were unstable at the time of admission. Studies done in Liberia and another study in Kerala also showed that patients had multiple referrals (15, 16).

87.8% of near miss patients were antenatal and only 20.4 % of the near miss cases had a previous complicated pregnancy which was similar to the study done in Assam (14). The most common co morbidity associated with the current pregnancy was hypertensive disorders of pregnancy followed by thrombocytopenia. This was comparable to studies done in Assam, and Myanmar (14, 12).There was a low incidence of anaemia with most of the patients having regular intake of iron and folic acid.

Type I delay was identified to be the most common type of delay, which was seen in 48.6 % of the near miss cases, followed by combined type I and II delays in 21.6 % of the cases and isolated type II delay seen in 12.2 % of cases. Type III delay was seen in 2.7 % of cases which were also associated with type I delay. There was no delay in 14.9 % of the cases. Similar results were obtained in Studies done in Wayanad, Kerala, India and also in Pakistan (13, 15). In a study conducted in Myanmar, the causes of delay were type I followed by type III and type II (12).A study conducted in selected districts of 4 Indian states showed that 54 % of the delay was attributed to the delay in deciding to seek maternal care followed by 30 % delay in coordinating transportation and 16 % in obtaining care at the facility (17).

Delay in seeking care causes a large number of women reaching health facility in a poor clinical condition. The barriers most related to health care seeking behavior are economic status, distance to facility, educational levels, women's autonomy, recognition of the disease and knowledge and attitudes about use of health system. In this study, most common cause of delay was lack of judgment about the seriousness of the problem and lack of awareness of the danger signs of pregnancy which led to waiting for the problem to resolve on its own. This is the most complex event to resolve in obstetric care chain because it involves the concept of access and phenomenon of behavior.

Phase II delay is usually due to lack of accessibility to health services which is influenced by financial, organizational and socio-cultural barriers. In studies from developing countries, most common causes for second delay were financial issues, difficulty in transportation and financial issues. Lack of deciding person and lack of an accompanying person were the major cause of type II delay in this study. It was seen that in all cases the deciding person was not the woman herself even in women who had their own income. Fear of hospital and health providers were seen in 5% of the cases, while referral issues were present in 5 of the cases. Difficulty in transportation was found only in 1 case with financial issues were a problem only in 5 cases.

The cumulative effect of phase I and II delays contributes to the women reaching the facility in poor condition. Chronic shortage of trained staff and essential supplies, interval between decision to do emergency surgery and time of starting the surgery exceeding 30 minutes, delays in initiating treatment, shortage of blood products etc accounts for phase III delay. Cause of type III delay in this study was non availability of the theatre while studies from developed countries show type III delay due to lack of emergency services, shortage of staff and lack of blood products.

Conclusion

Maternal mortality and morbidity are sensitive indicators of standard care. As there are no methods of primary prevention to reduce maternal mortality, reducing the time from onset of complication to outcome can play a large role in decreasing maternal complications. It is important to understand that outcome of every mother is influenced not only by the medical assistance but also is influenced by various social and behavioral causes. Lack of awareness in the common population rates about the complications of pregnancy in spite of high literacy has

been found to be the major factor in causing delay in availing treatment. It is important to join hands to educate the general population to bring about a major change in the health of women.

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