Brought in Dead: An Avoidable Delay in Maternal Deaths

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About the Author

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learned teacher.

Abstract

Purpose Maternal brought in dead are the patient who dies in the need of adequate medical care. These deaths are often not analyzed sincerely as they are not institutional

deaths. Our aim is to find out actual life threatening cause of delay leading to death.

Method Patients brought dead to casualty were seen by the doctors on duty in Department of Obstetrics and Gynaecology, Gandhi Medical College, Bhopal round the clock. Cause of death was analyzed by verbal autopsy of attendants and referral letter from the institute. In this analytical study a complete evaluation of brought deaths from January 2011 to December 2014 was done.

Results A total of 64 brought in deaths were reported in this 4 year duration. Most common cause of death was postpartum hemorrhage (54.68 %) followed by hypertension (15.62 %) and the most common cause of delay was delay in getting adequate treatment (56.25 %).

Conclusion The brought in dead are the indicator of the three delays in getting health care. Challenges appear to be enormous to be tackled. Timely management proves to be critical in preventing maternal death. Thus it appears that community education about pregnancy and its complications,

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EmOC training at FRU and strict adherence to referral protocol may help us to reduce the brought dead burden.

Keywords Brought in dead · Maternal deaths · Verbal autopsy · EmOC · Referral protocol

Introduction

“Whose faces are behind the numbers? What were their stories? What were their dreams? They left behind children and families. They also left behind clues as to why their lives ended so early” [1].

Complications of pregnancy and labor if not managed on time may lead to maternal deaths. The alarming increase in the number of unfortunate women who had to sacrifice their lives due to the delays in getting medical care emphasizes the need to identify the causal problems which should be resolved early to make the earth a better place to live in for the motherhood.

Globally, there were an estimated 289,000 maternal deaths in 2013, showing a decline of 45 % in the mortality rate compared with 1990. At the individual country level, the two countries that accounted for one third of all global maternal deaths are India with 17 % (50,000) and Nigeria at 14 % (40,000). The global maternal mortality ratio (MMR) in 2013 was 210 maternal deaths per 100,000 live births, down from 380 maternal deaths per 100,000 live births in 1990 [2]. Thus, there is significant reduction in maternal deaths with safe motherhood initiative; although much has been achieved, yet much remains to be done.

The MMR of any nation reflects not only the adequacy or inadequacy of obstetric care but also the general level of social and economic development. As a consequence, there has been generated a great concern in saving the mother and baby by every nation. Strict analysis of all maternal deaths in any institute is carried out, and corrective measures to reduce maternal deaths are adopted at the institute level so that it gets reflected on the nation with a better national MMR score.

Most women (85 %) have healthy and safe pregnancies and birth. Many women “at risk” never develop complications, and a significant number of women who are at “low risk” mostly do. A woman can shift from low-to-high-risk category (or vice versa) throughout pregnancy and postpartum. 40 % of all pregnant women have some complications, and up to 15 % of them need emergency obstetric care to manage life-threatening complications to the mother or child [3]. Timely recognition of warning signs of complications in pregnancy or childbirth, comprehensive management, and rapid referral and transportation of the patient to the competent tertiary care center

are absolutely needed to reduce maternal death. This could be achieved with the help of trained staff in Emergency Obstetrics Care (EmOC) services who should be available as close as possible to where pregnant women live.

Sometimes, by the time the patients reach a tertiary care center, it is already too late to manage, and most of these women are usually dead on arrival or they die within few hours.

Dead on arrival (DOA), also called dead in the field and brought in dead (BID), is a term used to indicate that a patient was found to be already clinically dead upon the arrival of professional medical assistance, often in the form of first responders such as emergency medical technicians, paramedics, or police.¹

“Brought in dead” is an indicator of sociocultural level and health care delay. These cases are linked with hospital death, an unfortunate loss before the patient gets the deserved care. Those who are brought dead are not analyzed as seriously as hospital death in many hospitals. The maternal brought dead cases are the real indicator of delay in getting proper health services to a serious patient. Had they been timely treated, these patients would have been a case of “near miss.” Thus, we hope to highlight the importance and the necessity of maintaining records of such cases in the hospital register so that these cases are not lost from the mortality statistics.

Objective

The objectives of this study were to analyze the magnitude of the brought dead cases to the tertiary care hospital during the period of 4 years of 2011–2014 and the causes of those deaths by verbal autopsy, and to emphasize the importance on maintaining the records of “brought in dead” in hospitals.

Study Methods

In this analytic study, a complete evaluation of brought dead cases from January 2011 to December 2014 was done at the Department of Obstetrics and Gynaecology, Gandhi medical College, Bhopal. This hospital is tertiary care referral center for five districts of Madhya Pradesh: Bhopal, Vidisha, Sehore, Raisen, Rajgarh, and Sagar. Thus, this center has a high influx of high-risk referred patients.

The patients brought dead to casualty were seen by the doctors on duty in the tertiary care hospital round the clock. A questionnaire directed toward trying to find out the

¹ https://nl.wikipedia.org/wiki/Dead_on_arrival.

probable cause of death was given to persons bringing the “brought dead” case for verbal autopsy. Separate records were kept for the patients being brought dead to the hospital. These records were titled “Brought dead” to the hospital. These records were analyzed for the possible direct cause of death, and factors directly or indirectly affecting the cause of death were discussed during the monthly maternal mortality meetings. Information was collected about women’s booking status, age, parity, place of referral, multiple referrals, and reasons for delayed referral, and the treatment given before referral. Women who received antenatal care at least three times in our hospital were labeled as “booked” and the rest of the patients as “unbooked.” The causes of maternal deaths were recorded. More than one factor may have contributed to maternal death, but the predominant cause on clinical judgment was recorded as autopsies were not performed. These brought dead data were compared with deaths in hospital to analyze variations between the two.

The aim of our study was to analyze the causes of delay by verbal autopsies of those brought dead and to look at the new scenario by way of improving the health care.

Results

With the increasing number of hospital deliveries and better quality of obstetric care, we have observed decreasing trends in the MMR in our institute. A total of 64 brought in dead, and 180 institutional maternal deaths were reported during this 4-year study period of 2011–2014 (Fig. 1).

In our study, age, parity, and pregnancy status of patients were similar in both groups of brought dead and maternal deaths in hospital. In both the groups, a majority

of the women were aged 20–30 years and were multipara. Most of the women who died belonged to low socioeconomic status. Maximum brought dead cases were unbooked (98.43 %) and referred from some other institute, and only 4.68 % of patients directly reported to our hospital. In both the groups, postnatal period was the most grievous part of pregnancy state followed by antenatal period. In the brought dead group, 17.5 % were found to be home delivery cases. This indicates that there was inadequate primary treatment in brought dead patients and that referral protocol was not followed strictly (Table 1, 4).

Hemorrhage was found to be the most common cause of maternal mortality in our institute. 64 % of maternal brought dead cases died of hemorrhage (75 % of them were due to postpartum hemorrhage), followed by 15.62 % who died of hypertensive disorders of pregnancy, and 6.25 % were due to pulmonary embolism. However, in the cases of institutional deaths, hypertensive disorder (31.1 %) was the more predominant cause of death compared to postpartum hemorrhage (18.33 %) (Table 2).

It was found that a large percent of patients (37.71 %) had multiple referrals which led to the delay in getting appropriate management on time. Major cause of delay was the delay in getting adequate treatment (56.25 %) (Table 3, 4).

Discussion

This study was carried out to analyze and stress the importance of maternal brought dead cases and to find out any avoidable causes for the delay. We found 64 brought dead women in the study period of 4 years. Most of the women who died during pregnancy and childbirth and were brought dead to hospital belonged to 20–30-year age group (85.93 %) and were multipara (59.37 %).

Fig. 1 Trends of maternal mortality

Table 1 Demographic details of maternal death

	Dead on arrival		Death in hospital		<i>P</i> value
	Number	%	Number	%	
Age					
<20 year	00	00.00	003	01.67	NS
20–30 year	55	85.93	147	81.67	
>30 year	09	14.07	030	16.66	
Parity					
Primipara	20	31.25	063	35.00	NS
Multipara	38	59.37	100	55.55	
Grandmultipara	06	09.38	017	09.44	
Socioeconomic status					
I, II	02	03.13	012	06.66	NS
III, IV	62	96.87	168	93.34	
Pregnancy status					
Antenatal	16	25.00	054	30.00	NS
Intranatal	05	07.81	006	03.33	
Postnatal	40	62.50	113	62.77	
Postabortal	02	03.13	005	02.77	
Ectopic	01	01.56	002	01.11	
Booking status					
Booked	01	01.56	010	05.55	NS
Unbooked	63	98.43	170	94.44	
Referral status					
Direct admission	03	04.68	042	23.33	<i>P</i> = 0.00057
Referred from hospital inside city	13	20.32	046	33.33	
Referred from hospital outside city	48	75.00	092	66.67	
Place of delivery					
Home	07	17.50	008	04.44	NS
Hospital	33	82.50	105	58.33	

Only one out of the 64 patients was booked to our hospital and six others had visited some other hospitals; rest of the women never visited any hospital during their pregnancy. This high number of unbooked patients indicates the importance of antenatal care. Similarly, most of the other studies related to maternal mortality showed that the majority of women in their study did not undergo any antenatal care during the index pregnancy [4, 5]. Deaths due to anemia and hypertension would have been avoided if these poor illiterate patients had had antenatal visits.

62.5 % of the brought in dead cases were postnatal who died of hemorrhage (64.06 %) out of which PPH (75 %) was the commonest cause of hemorrhage followed by hypertension (15.62 %) as second-most common cause.

Priya et al. found that the parity distribution showed a predominance of multigravidas (49.48 %). 74.22 % women were in 21–30-year-age group [5]. Postpartum hemorrhage is

the most predominant cause of maternal mortality followed by PIH. Many studies in India have reported similar results [6, 7].

A study carried out at the JPMC to establish the factors that caused delay in women reaching hospital in time, during a 12-year period of 1981–1992, showed that 150 (25 %) women were brought dead out of a total of 601. The commonest cause of death among these 150 women was hemorrhage (63 %) of which 42 % were postpartum hemorrhage followed by eclampsia (19.3 %), ruptured uterus (9.3 %), and acute inversion of uterus (6 %) [8].

Thaddeus and Maine [9] articulated a three type of delay framework to identify factors associated with a high MMR. The first refers to the delay in identifying life-threatening obstetric complications in home deliveries, the second to a delay in reaching a health facility, and the third to a delay in getting appropriate treatment of good quality after arriving at a health facility [9].

Table 2 Causes of maternal deaths

Cause	Dead on arrival		Death in hospital	
	Number	%	Number	%
Hemorrhage				
Total	41	64.06	62	34.44
Atonic	24	58.53	26	41.93
Traumatic	11	26.83	11	17.74
APH	03	07.34	18	29.04
Ectopic	01	02.43	02	03.23
Abortion	02	04.87	05	08.06
Hypertensive disorder of pregnancy				
Total	10	15.62	56	31.11
CVA	06	60.00	29	51.78
Pul edema	04	40.00	26	46.43
Aspiration pneumonitis			01	01.79
Pulmonary embolism	04	06.25	04	06.25
Anaemia	04	06.25	04	06.25
Septicemia	–	–	–	–
Obstructed labor/ruptured uterus	02	03.12	02	03.12
Cardiac disease	01	01.56	01	01.56
Hepatic encephalopathy	01	01.56	01	01.56
Malaria	01	01.56	01	01.56
Hepatitis			03	01.67
Respiratory failure			03	01.67
Amniotic fluid embolism			01	00.55

Table 3 Time duration of referral to arrival at our hospital

Duration of referral	From first referral	From the time of delivery
<3 h	28	2
3–6 h	16	19
6–12 h	19	10
12–24 h	01	09
>24 h	–	02

Table 4 Reasons for delay in reaching the hospital (Dead on arrival) and number of referrals

	Number (n)	Percentage
Delay in seeking health advice	08	12.50
Delay in reaching appropriate health facility	20	31.25
Delay in receiving adequate treatment	36	56.25
Single referral	38	62.29
Multiple referrals	23	37.71

In our study, many women who were brought dead had hospital delivery cases which were either identified “late” or “referred late” to tertiary care. There was definite delay

in management of patients with PPH—as the golden period for management of PPH is 2 h only.

Many unfortunate women did not get transported to our center on time because of longer distances; some have to travel from facility to facility before getting adequate management. We found significant number of multiple referrals (37.71 %). Most of the women were found to have delay in getting adequate treatment (56.25 %) followed by delay in reaching appropriate health facility (31.25 %).

Oril et al. found that reasons given for delay in their study included inability to obtain transport (41.7 %), and the inability of health care staff to detect an obstetric emergency early enough and refer to an appropriate center (33.3) [10].

Shah et al. in their study on maternal delay found that one or more types of delays were present in 98 (94 %) women, and the second type of delay was the most frequent, occurring in 73 (74 %) women. The first type of delay was found to occur in 70 (71 %) women, and the third type of delay in 47 (48 %) women [4].

It becomes apparent that many of the deaths that occurred could have been avoided if they had been transferred earlier and proper referral protocol had been followed; this further highlights the need for adequate and

quick transport facilities. Lack of qualified medical attention and delayed referral also resulted in late intervention.

An effective referral system ensures a close relationship among all levels of the health system and helps to ensure people receive the best possible care closest to their homes. Support to health centers and outreach services by experienced staff from the hospital or district health office helps build capacity and enhance access to better quality care. A referral health facility should understand client's condition, use protocols of care for that condition at that level of service, treat and stabilize client & document treatment provided; timely take decision to refer with outward referral form and communicate with receiving facility. If the client is very ill, it might be necessary for a health-care worker to accompany them to the receiving facility. If forewarned, the receiving facility can anticipate the arrival with their referral form. They will use the information sent on the referral form to begin a thorough assessment of the client and to provide the client high-quality care and maintain documentation according to agreed standards. When the client's care has finished at the higher level facility, back referral to the original facility is important. This communication not only assures proper patient care and follow-up, but also provides continuing education to the initiating facility and their staff [11].

Disadvantages faced by poor rural women can be minimized by upgrading existing facilities at district and sub-district levels to provide Comprehensive Emergency care and by facilitating transportation of poor rural women directly to these facilities when they experience life-threatening complications of childbirth. EmOC entails upgrading peripheral facilities to provide basic and comprehensive obstetric care, i.e., renovating and maintaining health facilities as well as supplying and equipping them appropriately; training the health staff to manage obstetric complications as well as the complications of the newborn; training the staff to efficiently manage the health facilities; ensuring that a functioning referral system is in place which links peripheral facilities to district health facilities or referral centers.

Various campaigns to educate pregnant mother about pregnancy and its complications should be conducted.

Conclusion

Even in this era of assisted reproduction and robotic surgery, India is still struggling to cope with maternal deaths. Maternal brought dead cases are an important indicator in terms of health facility and sociocultural delay. The commonest cause of brought dead cases was postpartum hemorrhage which permits only 2 h to manage, followed by hypertension as the second-most common cause. Both

these most common causes are preventable. Thus, better EmOC at periphery along with proper referral system helps the doctors in making the early diagnosis and ensuring the timely management of complications. A referral system will function effectively if all the service providers as expected adhere to the referral discipline, refer appropriately, and to follow the agreed protocols of care. Maternal brought dead cases are an important indicator of maternal deaths, so every hospital should keep a separate record of such cases.

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Authors' contributions A Kumar: Project development and Manuscript writing. N Agrawal: Manuscript writing, Data collection, and analysis.

Compliance with Ethical Standards

Conflict of interest We have no financial relations with any organization. We have full control of all primary data and that we agree to allow the journal to review their data if requested. The authors declare that they have no conflict of interest.

Ethics approval Manuscripts submitted for publication are based on retrospective data analysis as per ethics with the consent of using stored data from the hospital authority, which has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Details that might disclose the identity of the subjects under study are omitted.

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