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Maternal Dead On Arrival At Tertiary Care Centre

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Abstract
Objective- To analyse the maternal dead on arrival cases and to identify the underlying cause. Material and Methods- In this retrospective study, analysis of all the patients who were declared clinically dead on their arrival at emergency department of obstetrics and gynecology of a tertiary care centre in western Rajasthan, India was done over a period of 2 years (June 2016-2018). Results- Over a period of 2 years, 40 maternal dead on arrival cases were evaluated. Postpartum hemorrhage was found in 20 out of 40 cases (50%) as a major cause of death. 34 patients reached our centre within 3 hours from first referral among them only 7 had delivered within 3 hours. Multiple referrals were found in 10% patients while delay in receiving blood and blood products was found in 35% cases. Conclusion- Decrease in maternal mortality figures is every nation's pride but striking at the avoidable cause behind such tragedies will be a surreal achievement. Investigating maternal dead on arrival cases is not only helpful in rectifying the direct cause but also alarms the peripheral medical force for timely management and referral of high-risk pregnancies.

Keywords- *Brought in dead, Maternal mortality ratio, Anemia, Hemorrhage*

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I. Introduction:

Maternal death is defined as "The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes".[1]

Death of a mother as a consequence of child birth, amidst the catastrophy, leaves a dismal mystery behind it. In order to prevent such tragedies, it is pivotal to answer this. A mother serves as a pillar of strength and support. Maternal death is not only a global burden but also a disaster for the family.

Maternal mortality serves as a highly sensitive index of health care system in the community. It is not only reflection of quality and standard of obstetric services but indirectly an index of the socioeconomic status, poverty, ignorance and social customs of people.

In India maternal mortality rate reduced from 212 /100,000 live births in 2007 to 178 deaths in 2012 to 130 deaths in 2016 but improvement in mere figures is not enough unless there is reduction in important causes of maternal deaths.[2]

When a patient is found to be clinically dead upon the arrival of medical assistance, they are generally grouped as dead on arrival (DOA) cases or brought in dead (BID).[3]

Among maternal deaths, there is very limited data on "dead on arrival" cases which are not analysed sincerely as these deaths are generally unbooked and not institutional. Moreover there are problems in eliciting history and identifying reason behind such tragedies. But audit of these maternal brought dead cases is important to directly rectify reasons of delay in pursuing appropriate health care.

Thus, aim of this study is to analyze the dead on arrival cases and to identify the underlying cause which could have rather been cases of "near miss" had they been managed promptly.

II. Material And Methods:

Study type- Retrospective study

Study place- Tertiary care centre, Western Rajasthan, India.

Study Duration- June 2016 to June 2018

Data collection- Upon arrival of such cases, the bereaved family was handled delicately while breaking the bad news. Information directed at finding the cause was collected from them in form of verbal autopsy. Each patient's demographic details, duration of symptoms, thorough obstetric history, reference notes, time since referral, mode of delivery, intervention done were analyzed from case tickets, maternal death audit forms and a register exclusively made for such cases. In few cases additional required information was collected telephonically, contacting the deceased's family or the centre where she was referred from. Socioeconomic status was classified based on Modified Kuppuswamy scale. Ethical committee approval was taken.

Patient selection- All the patients who were declared dead clinically upon arrival at our hospital and first contact by medical personnel, were included in the study.

Analyses- Data collected was scrutinized thoroughly, tabulated and described using percentages.

III. Results:

Over our study period 40 maternal brought dead cases were evaluated. Among these, majority were primigravida and under the age group of 25 years. These cases were mostly unbooked (85%) and belonged to low socio-economic status (97.5%). Out of 40 cases, 10 were undelivered and one patient had undergone an abortion. Out of emaining 29 delivered patients, 14 Only few of them were admitted directly to our hospital (7.5%) while 82.5% of them were referred from a government centre outside the city. Postpartum period was most agonizing as 72.5% deaths occurred during this period, 90% were delivered in hospital (Table 1). Most deaths were attributed to haemorrhage in 57.5% cases. Other common causes were septic shock and eclampsia (Table 2). Maximum number of patients (85%) reached our hospital within 3 hours of referral but 62.5% reached our facility after 3 hours of being delivered (Table 3). Analysis of deaths suggested that there was delay in reaching an appropriate health facility in nearly 30% patients. Only 4 patients had multiple referrals (Table 4).

IV. Discussion:

Dead on arrival cases are unintentionally ignored in terms of investigating the sequence of events behind it, record maintenance and rectification of cause to prevent such tragedies in future. A motherless child is likely to have fogged future which indirectly decides the future of the country. Over a study period of 2 years, there were 40 cases of maternal brought dead. Our institutional maternal mortality cases in these 2 years were 67.

In our study, majority of women were under 25 years of age (37.5%), belonged to rural area (60%) and low socioeconomic status (97.5%) suggesting prevailing illiteracy and continuation of early marriage customs in such localities. These findings were consistent with Kuralkar et al.[4] In our study youngest female was 20 years old and oldest was 42 years of age.

Significance of regular antenatal visits and consultation is clearly reflected by high percentage of deaths in unbooked cases (85%). Similar results were recorded by Kumar et al.[5]

Anemia was associated complication in 20 out of 40 cases further aggravating existing problem. This reflects the necessity of intervention in prevention of anemia in antenatal women which might buy some time in arranging blood products in cases of emergency.

Postpartum period accounted for most number of deaths (72.5%). Atonic postpartum hemorrhage was found to be most common cause of death. Other common causes were septic shock (15%) and eclampsia (12.5%). In a study by Lamba et al[6], they found haemorrhage (22.22%), hypertensive disorders (Eclampsia 20%, severe pre-eclampsia 2.22%), pulmonary embolism (8.89%) and Sepsis (6.67%) as direct causes leading to maternal mortality. Training of birth attendants at periphery, especially, active management of third stage of labour would be helpful in bringing down deaths due to hemorrhage.

Primary management at the referral centre was scrutinized to determine the cause of delay. In our study, 34 patients reached the tertiary care centre in less than 3 hours since the referral among them 10 were undelivered and only 7 patients were referred within 3 hours of being delivered, rest of the 16 patients might have been saved, had the lacunae been filled promptly. A study carried out by Thaddeus and Maine[7] described three types of delay framework to identify factors associated with a high maternal mortality.

In our analysis, the major cause of delay was found to be delay in receiving blood products owing to scarcity of blood banks in rural areas. Such cases were eventually referred for tertiary care.

Points where time could have been bought and a life could have been saved include, easy availability of blood and its products, antenatal booking and early referral of high risk pregnancies to tertiary care, efficient emergency transportation services and communication between the referral and referred centres for preparedness to handle the emergency instantaneously.

Target will be achieved when no pregnant woman will be deprived of antenatal booking with maximum number of hospital deliveries and no home deliveries without skill birth attendants.

V. Limitations-

Our study is concise to maternal dead on arrival cases load in Rajasthan and lacks wider application.

Sometimes, due to disturbed state of mind of deceased woman's relatives extraction of information is incomplete, unreliable or ambiguous.

On a positive note, since our institute is a major referral centre of nearly 2,000 villages in western Rajasthan with over 16,000 vaginal deliveries and over 6,000 cesarean deliveries each year, our study clearly depicts the burden of maternal dead on arrival cases in this area.

VI. Conclusion-

Prevention is better than cure. Few deaths might be unavoidable but this excuse shouldn't overpower the ability of a medical attendant in saving a life. Prompt development of their reflexes by conducting emergency drills might prove helpful. Our study brings the focus on brought dead maternal cases and the story behind the tragedy. It highlights importance of early registration, regular antenatal visits, identification of risk factors, prompt first line management, strengthening referral and transportation systems. If feasible, authorities where the patient has been referred to should be informed beforehand. Finally, dealing with the root cause of community, that is illiteracy.

Conflict of Interest- None

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Tables-

Table 1: Characteristics of maternal brought dead cases

Characteristics		Maternal Deaths	Percentage
Age	<25	15	37.5
	25-29	12	30
	30-34	9	22.5
	≥35	4	10
Parity	Primipara	19	47.5
	Multipara	12	30
	Grandmultipara	9	22.5
Antenatal visits	Booked	6	15
	Unbooked	34	85
Locality	Rural	24	60
	Urban	16	40
Socioeconomic status	I, II	39	97.5
	III, IV	1	2.5
Pregnancy status	Antepartum	3	7.5
	Intrapartum	7	17.5
	Postpartum	29	72.5
	Postabortal	1	2.5
Referral status	Direct admission	3	7.5
	Referred from private centre outside city	4	10
	Referred from govt. centre outside city	33	82.5
Place of Delivery	Home	4	10
	Medical centre	36	90

Table 2: Distribution of cases according to cause of death

Cause		
Hemorrhage	Total	23
	Atonic postpartum hemorrhage	18
	Traumatic postpartum hemorrhage	2
	Antepartum Hemorrhage	3
Septic Shock		6

Eclampsia		5
Acute Respiratory Distress Syndrome		4
Disseminated intravascular coagulation		1
Cardiac Arrest		1

Table 3: Duration of cases brought dead since time of their first referral and delivery

Duration	From first referral	From the time of delivery
<3 h	34	7
3-5 h	5	14
6-11 h	0	6
12-23 h	1	2
≥24 h	0	3

Table 4: Distribution according to probable delays

	Number	Percentage
Lack of awareness	5	12.5
Delay in reaching appropriate health facility	12	30
Delay in receiving blood & blood products	14	35
Multiple referrals	4	10