Social and biomedical causes of maternal mortality in Barpeta district of Assam- A community based study

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Abstract

Introduction: Maternal mortality is an important socio-demographic indicator. India has a high maternal mortality ratio and within India the state of Assam has the highest MMR in the country. Though maternal death is a biomedical event there are many factors leading to it. Social and biomedical factors are one such determinant .The present study attempt to analysis the role of such factors in a maternal death at a district level.

Material and Method: The study was done in Barpeta district of Assam. The maternal deaths during this year were identified by active and passive surveillance. In 50% of death social autopsy was conducted at the home of the deceased.

Results and Observation: In 64 % of maternal death social factors were found to cause or contribute to death of mother. Unlike previously reported in the state, post-partum hemorrhage is the leading cause of death followed by anemia and eclampsia. All villages in which mother died had ANM/ASHA and the mother sought antenatal care. Thus quality of ANC has to be improved.

Conclusion: Social factors are important determinant of maternal death. As social factors will take a long time for improvement service related deficiencies will have to be addressed immediately for further reduction of maternal death.

Keywords: Maternal Mortality, Surveillance, Social Cause, Post-Partum Hemorrhage, Assam, Accidental Maternal Death.

Introduction

Maternal mortality is a tragic event for the newborn, family and society at large. Most of it is preventable. It is an indicator of overall socioeconomic progress and is incorporated as its indicator. Though there is rapid improvement in the scenario, maternal mortality ratio is still high In India. The MMR in India has declined from 212 in 2007- 09 to 178 in 2010-12 and 168 in 2011-13.(1) While states like Kerala, Tamil Nadu, Maharashtra have achieved the Millennium Development Goal (MDG) of MMR of 109 by 2015, states like West Bengal, Andhra Pradesh, Gujarat and Haryana are in the process of achieving it. Nearly 2/3rd of maternal death in India is contributed by EAG (Empowered Action Group) states and Assam. In India, Assam has the highest maternal mortality ratio and is estimated to be around 328 (95% CI 229-427) as per SRS 2010-12 and 300 as per SRS 2011-13.(2) Though pregnancy related death is a medical event the reasons related to it are diverse. Various socio-cultural and behavioral factors play a role. Social factors are important determinants of maternal mortality. Early age at marriage, early first pregnancy, poor educational level, poverty, marginalized population, geographical isolation are some known social determinants.(3-6) In India, economic status and social status are all closely interrelated when influencing use of and access to maternal and reproductive health care. The biomedical causes of maternal mortality are known. They are the same all over the world and contribute in different proportion across geographical setting. An analysis of 182 maternal deaths in Assam from April to August 2012 shows pregnancy induced hypertension (25%), post-partum hemorrhage (23%) and anemia (21%) to the commonest cause of death.(7) A cohort analysis of 1007 deliveries in tertiary facilities of Assam shows anaemia and post-partum hemorrhage to be the leading causes of obstetric morbidity.(8)

Materials and Methods

We conducted a community based cross sectional study for one year in Barpeta district of Assam. The district has a population of 16, 93, 190 (Census 2011). The literacy rate is 63.81% and more than four-fifths of the population depends upon agriculture for their livelihood. Maternal health services are provided through a medical college, one district hospital, one sub divisional hospital, six CHCs, eight Block PHCs, twenty mini PHCs, eight state dispensaries and two hundred sixty four sub-centers. There are four hospitals in the private sector. We identified all the maternal death in the district during the study period. Inclusion criteria used was that the maternal death should qualify the definition of maternal death used in ICD 10 and be a resident of the district for at least 2 years. Source of such information was facility as well as community based. Information on maternal death was collected from all health facilities in the district. Information on maternal deaths occurring at home, during transportation and referral was collected from the community. To identify the maternal deaths we used the services of independent surveillance workers. We personally interacted and networked with Medical Officers, BDOs and CDPOs, Health, ICDS and ASHA supervisor, PRI members, Anganwadi workers. We conducted social autopsy in 50% maternal death i.e., 42

out of 79 maternal deaths. To assess socio-economic status we used Kuppuswamy socio-economic status assessment score 2014.[9] Biomedical causes of death were ascertained by examination of death certificates and medical records available with the family and transcription of verbal autopsy. In deaths which took place at the medical colleges, we examined the records from medical record department. The data was processed, coded, and tabulated manually. Descriptive statistics was used. Information emerging from in-depth interview was analyzed for thematic areas. Permission for the study was obtained from Institutional Ethics Committee.

Result

We identified 79 maternal deaths in the district during one year and conducted social autopsy in 42 cases.

Table 1: Socio-demographic Information of maternal deaths

Age at marriage	<18	23 (54.7)	
	18-25	13 (30.9)	
	25 – 30	06 (14.2)	
	>30	Nil	
Caste category	General	22 (52%)	
	SC/ST	07 (16%)	
	OBC	13 (30%)	
SE Status	Lower	20 (47%)	
	Upper Lower	12 (28%)	
	Lower Middle	06 (14%)	
	Upper Middle	03 (7%)	
	Upper	01 (2%)	
Literacy		**Wife**	**Husband**
	Illiterate	20(47.6)	27(64.2)
	Primary	04(9.5)	04(9.5)
	ME School	10(23.8)	07(16.7)
	High School	02(4.7)	Nil
	High School	06(14.2)	04(9.5)

Majority of the mothers were married before 18 years of age. Level of literacy was, in general low. 20 of the women who died (47%) were illiterate. In total 34 (80%) had less than 8 years of schooling. In 38 (90%) mothers, they had less than 8 years of schooling. Level of literacy was low in the husbands also. 27 (64%) were illiterate. In general husband's level of literacy was less than that of the respective wife in a majority of the couples. Of the 42 maternal deaths 7 (16%) of the women belonged to schedule caste and scheduled tribe, 13 (30%) were from other backward classes and 22 (52%) women belonged to the general class.

As regards occupation, 90% of the women were housewives and rest 10% engaged in petty jobs. 23 husbands (54%) were daily wage earners, 9 (21%) had petty business of their own, 5 were farmers and 5 were employees in govt. or private establishments. Socio-economic status in general was low. As per Kuppuswamy classification of socioeconomic status 20(47%) belonged to lower class, 12 (28%) were of upper lower, 6 (14%) lower middle, 3 (7%) upper middle and 1 (2%) upper socioeconomic status. Thirty (71%) of the women who had died were Muslims and 12 (29%) were Hindus. Forty one women were from rural area and 1 mother was from urban area. All were permanent residents of the district.

Social causes of maternal death: They are an important determinant of maternal mortality. In 27 maternal deaths (64%), social factors were found to play a role. These social causes acted as deterrents to favorable health seeking behavior or outcome. They contributed to the biomedical cause of maternal death. These causes were identified during the social autopsy on circumstances of death. More than one social factor operated in a maternal death, some such factors were teenage pregnancy in six maternal deaths, preference for home delivery in six maternal deaths, traditional methods tried first for retained placenta and when failed to work brought to hospital in three maternal deaths. Muslim mothers preferred delivery by female health worker. In such a scenario ANMs are found to set up private practice in their home. The ANMs cannot handle complications and considerable time elapse before they are referred to a tertiary facility and this caused 3 maternal deaths. Myths regarding IFA tablet consumption in known anaemic mother contributed to four maternal deaths. Anaemic status was known to family members and ASHA. In two maternal deaths families left tertiary hospital against medical advice to seek traditional remedy from Ojha (traditional healer). Seriousness of condition was not realized in two maternal deaths. They had prolonged labour and were kept at home for delivery and there was no support from family members. Domestic violence in pregnancy was identified in one maternal death.

Biomedical cause: Post-partum hemorrhage (26%) was found to be the commonest cause of death in the district. This was followed by anemic heart failure (16.7%) and eclampsia (14.2%). Prolonged labour accounted for 12 % of maternal death. In the present study indirect cause of maternal death are few as reflected in "other" causes of maternal death. This includes causes suggestive of fulminant hepatitis, embolism and unexplained causes. Only one mother had history of pre-existing illness of the nature of bronchial asthma. We identified two accidental maternal death, one due to burn injury and another suicidal death.

Discussion

Maternal mortality is an indicator of overall socio-economic development.[12,17] Early age at marriage is a

social practice.[13,14] A socio-demographic analysis of the maternal death shows majority of maternal deaths in low literacy, poor socio-economic condition (75% lower class) and backward caste. This observation is similar to studies elsewhere.[4,9-14] Census of India 2011 reported 69% male literacy, 58% female literacy and 7% SC/ST population in the district. Though many studies have reported caste marginalization we did not find so. This may be due to the fact that the district has only 7% SC/ST population. We observed higher death of 71% in Muslim women. We attribute this to the demographic composition of more than 60 % Muslim population in the district.[15] There was reluctance for hospital delivery by a male doctor. This social practice has contributed to death in Muslim mothers.

Post-partum hemorrhage was found to be the commonest cause of death in the district. This was followed by anemic heart failure and eclampsia. Anemia and pregnancy induced hypertension are the major causes of maternal mortality in Assam.[7,8] The present study also highlights such observation. PPH is the commonest cause of death in India [4,6,13,14] or Asia[16] or even globally.[17] Plausible explanation for this observation may be that the present study is community based and the analysis at the state level is mostly from facility based death review. Many cases of PPH cannot make it to the facility. Anemia by itself contributes to post-partum hemorrhage. In the present study indirect cause of maternal death are few as reflected in "other" causes of maternal death. History of domestic violence was reported in one of the maternal deaths. This may not reflect the actual situation as this variable was not included in the study instrument but came to light during verbal autopsy. A study from India reported high incidence of domestic violence in pregnancy.[13] Accidents or suicides in pregnant women or within 42 days of delivery have long been classified as being incidental to the pregnant state. However, mounting evidence suggests that such deaths might, at least in part, be caused by the pregnancy.[18,19]

Maternal death reflects social inequity. However these issues cannot be immediately addressed. Post-partum hemorrhage is the commonest cause of death in the district and it being an emergency condition, for further reduction of maternal death institutional delivery has to increase from the current level of 51.9%.[20] It will be relevant to mention that all villages reporting maternal death has ANM, ASHA and MCH sessions in place. With anaemia and eclampsia as the next major cause of death the quality of antenatal care needs to improve.

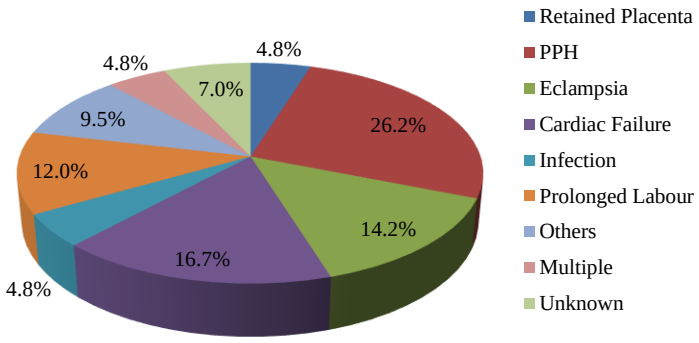

Fig. 1: Showing biomedical causes of maternal death

References

1. NITI Aayog release on MMR. niti.gov.in accessed on 10.4.17.
2. SRS Bulletin, Sample registration System (SRS) of Registrar General of India 2011-13 reports.
3. Bhatia Jagdish C.: Levels and Causes of Maternal Mortality in Southern India.Studies in Family Planning. Sept/Oct 1993. 24(5); pg 310-318.
4. Gupta SD, Khanna A, Gupta R, Sharma N K, Sharma N D . Maternal mortality ratio and predictors of maternal deaths in selected desert districts in Rajasthan a community-based survey and case control study. Womens Health Issues. 2010 Jan-Feb; 20(1):80-5.
5. Diana Gil-Gonzalez,a Mercedes Carrasco-Portinoa & Maria Teresa Ruiz Knowledge gaps in scientific literature on maternal mortality: A systematic review .Bulletin of the World Health Organization | November 2006, 84 (11).
6. Kranti S. Vora,, Dileep V. MavalankarK.V. Ramani, MuditaUpadhyaya, Bharati Sharma,,Sharad Iyengar, Vikram Gupta,andKirti Iyengar. Maternal Health Situation in India: A Case Study.J Health PopulNutr. 2009 April; 27(2):184–201.
7. Swasthya Sanbad. the quarterly NRHM news letter from Assam ;Vol 6, issue 2: page 13.
8. Nair M, Choudhury M K, Choudhury S S, et al Association between maternal anaemia and pregnancy outcomes: a cohort study in Assam, India. BMJ Global Health 2016;1:e000026 doi:10.1136/bmjgh-2015-000026 .accessed on10.4.17.
9. Zakirhusain Shaikh,Rambha Pathak.Revised Kuppuswamy and B G Prasad socio-economic scales for 2016.Int J Community Med Public Health. 2017 Apr; 4(4):997-999.
10. Vikram Khalid S Khan, Daniel Wojdyla, Lale Say, A Metin Gülmezoglu, Paul F A Van Look. WHO analysis

of causes of maternal death: a systematic review. India Health Beat, The World Bank Vol3 No 5, June 2010.
11. Iyengar SD, Gupta V, Iyengar K. Maternal health: a case study of Rajasthan. J Health PopulNutr.2009;27:271–92.
12. Satish Kumar. Reducing Maternal Mortality in India: Policy, Equity and Quality Issues.Indian Journal of Public Health, Volume 54, Issue 2, April-June,2010,pg 57-64.
13. B R Ganatra, K.J. Coyaji & V.N. Rao. Too far, too little, too late: a community-based case-control study of maternal mortality in rural west Maharashtra, India. Bull World Health Organ 1998;76:591-98.
14. B SubhaSri, Khanna, R. (2014). Dead Women Talking: A civil society report on maternal deaths in India. Common Health and Jan Swasthya Abhiyan,2014.
15. Baseline Survey of Minority Concentrated Districts, District Report-Barpeta. ICSSR, Study Commissioned by Ministry of Minority Affairs. Government of India. Page 3.
16. Khalid S Khan, Daniel Wojdyla, Lale Say, A MetinGulmezoglu, Paul F A Van Look. WHO analysis of causes of maternal death: a systematic Review. Lancet 2006; 367:1066–74; Published Online March 28, 2006.
17. Carine Ronsmans, Wendy J Graham, on behalf of The Lancet Maternal Survival Series steering group Maternal mortality: who, when, where, and why.www.thelancet.comVol 368 September 30, 2006,pg 89-98.
18. Fauveau V, Blanchet T. Deaths from injuries and induced abortion among rural Bangladeshi women. SocSci Med 1989; **9:**1121–27.
19. Ronsmans C, Khlat M. Adolescence and risk of violent death during pregnancy in Matlab, Bangladesh. Lancet 1999; 354**:**1448.
20. Govt. of India, MOHFW. National Family Health Survey 2015-16. District Fact Sheet Barpeta, Assam; pg 3.