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SOCIO-DEMOGRAPHIC PATTERN IN MATERNAL DEATH: A POPULATION- BASED STUDY FROM INDIA

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ABSTRACT

High maternal mortality ratio is not just an indicator of poor development but also an indicator of lack of human rights and gender inequity. Our study aimed to assess the distribution of biosocial characteristics amongst the different known causes of maternal deaths. Data was collected from the family members of the deceased for socio-demographic characteristics through pre-tested schedule and verbal autopsy was done to ascertain the cause of death. Majority of deaths due to post-partum hemorrhage, sepsis and anemia were in 22-29 years of age group, both the husband and wife were illiterate and were of poor socio-economic status. Ensuring that mothers from this section of society receive appropriate maternal care despite of their bio-social barriers is the need of the hour.

Introduction

Two decades after the launch of Safe Motherhood Campaign in 1987, India witnessed decline in trends of maternal mortality ratio (MMR), however, India continues to be amongst the countries with high MMR.[1] In the year 2013-2014 MMR of India was 167 per 100,000 live births. MMR of Uttar Pradesh, the most populated stated of India, was second highest as 285 per 100,000 live births.[2]

Several reasons are cited for high maternal mortality in India including poverty, illiteracy. This highlights the need to view maternal mortality a human rights issue. [3] The leading cause of maternal death was post-partum hemorrhage (75%), obstructed labour and abortions(11%),sepsis (8%), from a study in U.P. Anemia was the most important indirect cause of maternal death.[4]

Different cause of maternal deaths may develop due to certain social factors working in background. The aim of our study was to assess the distribution of various socio-demographic factors of the deceased mothers according to their cause of maternal death.

Materials and Method

A population-based case control study was conducted on 90 maternal deaths identified from all of the rural blocks of Lucknow using snow –balling technique during the one year study. This paper explores the distribution of socio-demographic characteristics of the mothers dying amongst their identified cause of maternal death. Study participants were females (aged 15-49 years) in the study area that delivered and died within 42 days of termination of pregnancy in the reference period as per ICD-10 definition of maternal death.[5]

The nine blocks of Lucknow comprised of a population of 15, 50,737. The crude birth rate of rural Lucknow was 29.7 per 1000 live births (Census 2011) and MMR for U.P was 359 per 100,000 live births (SRS 2009).[6,7] The estimated live births was 46,057 and 165 maternal deaths in a year at the given rates. Due to deficient reporting we expected reporting of deaths between 25-40%. Best suitable respondents were interviewed after the mourning period.

Data collection was done using UNICEF's maternal and perinatal death inquiry and response tool (MAPEDIR) verbal autopsy to ascertain the cause of maternal death and a pre-tested, semi-structured schedule was used to identify their biosocial characteristics**.** ICD-10 definitions were used for complications during pregnancy and delivery and cause of death.[5] For assessing socio-economic status Modified B.G Prasad's Scale was used. [8]

Data was tabulated on Microsoft Excel and analyzed using SPSS, Version 17.0. Results were expressed in proportions.

Ethical Consideration: The study received clearance from the Ethical Board Committee of the King George's Medical University, Lucknow,UP, India**.** The objective, purpose of the study were explained to all the participants in their local language and written informed consent taken.

Results

Age of the mother: Most of the mothers died were in the age group of 22-29 years (57.8%) followed by ≥ 30 years (24.4%). Majority of the mothers who died from Hemorrhage, Sepsis, Eclampsia, Obstructed Labour, Abortion, Anemia were in the age group of 22-29 years. Majority of the mothers who died were reported to have conceived for the first time at an age of less than 21 years (66.7%). Majority of the mother dying from Hemorrhage, Sepsis, Abortion, Anemia were reported to have conceived for the first time at an age less than 21 years. All of the women who died because of Abortion had conceived before the age of 21 years. (Table-1)

1.Cause of maternal death according to age of the mother (n=90)

Cause of Death	Age during index pregnancy (years) (%)			Total	Age at time of first conception (years) (%)		Total
	≤21	22-29	≥30		<21	≥21	
Hemorrhage	3 (8.1)	23 (62.2)	11 (29.7)	37 (41.1)	23 (62.2)	14 (37.8)	37 (41.1)
Sepsis	4(25%)	8(50)	4(25)	16 (17.8)	13 (81.2)	3(18.8)	16 (17.8)
Eclampsia	3(37.5)	4(50)	1(12.5)	8(8.9)	4(50)	4(50)	8(8.9)
Ruptured Uterus	1(33.3)	1(33.3)	1(33.3)	3(3.3)	1(33.3)	2(66.7)	3(3.3)
Obstructed Labour	0(0)	4(66.7)	2(33.3)	6(6.7)	3(50)	3(50)	6(6.7)
Abortion	0(0)	2(66.7)	1(33.3)	3(3.3)	3(100)	0(0)	3(3.3)
Anaemia	4(28.5)	8(57.1)	2(14.3)	14 (15.6)	11 (78.6)	3(3.4)	14 (15.6)
Others	1(33.3)	2(66.7)	0(0)	3(3.3)	2(66.7)	1(33.3)	3(3.3)
Total	16 (17.8)	52 (57.8)	22 (24.4)	90 (100)	60 (66.7)	30 (33.3)	90 (100)

Literacy status: Majority of the mother who died were illiterate (65.6%) and their husbands were illiterate (54.5%). Disease-wise majority of the mothers dying from Hemorrhage, Sepsis, Anemia were illiterate and their husbands were found Illiterate.. (Table-2)

2.Cause of maternal death according to Literacy status of mother and her husband (n=90)

Cause of Death	Literacy status of mother (%)		Total	Literacy status of husband (%)		Total
	Illiterate	Literate		Illiterate	Literate	
Hemorrhage	23(62.2)	14(37.8)	37(41.1)	20(54.0)	17(46.0)	37(41.1)
Sepsis	10(62.5)	6(37.5)	16(17.8)	14(87.5)	2(12.5)	16(17.8)
Eclampsia	4(50)	450()	8(8.9)	5(62.5)	3(37.5)	8(8.9)
Ruptured Uterus	3(100)	0(0)	3(3.3)	3(100)	0(0)	3(3.3)
Obstructed Labour	3(50)	3(50)	6(6.7)	4(66.7)	2(33.3)	6(6.7)
Abortion	3(100)	0(0)	3(3.3)	3(100)	0(0)	3(3.3)
Anaemia	10(71.4)	4(28.6)	14(15.6)	8(57.1)	6(42.9)	14(15.6)
Tuberculosis	0(0)	3(100)	3(3.3)	0(0)	3(100)	3(3.3)
Total	59(65.6)	31(34.4)	90(100)	49(54.5)	41(45.5)	90(100)

Socio-Economic Status: Most of the mother who died belonged to Class IV of Socio-Economic class (56.7%). Majority of the mothers dying from Hemorrhage, Sepsis, Eclampsia, Ruptured Uterus, abortion belonged to Class IV socio-economic status while majority dying from Anemia belonged to Class V socio-economic status. Most of the mother dying did not have BPL (Below poverty Line) card (54.4%). Majority of the mothers dying from Hemorrhage, abortion did not have BPL card while majority of the mothers who died from Eclampsia, Ruptured Uterus and Anemia were BPL card holders. (Table-3)

3.Cause of maternal death according to Socio-economic status (n=90)

Cause of Death	Socio-Economic Class (%)		Total	BPL card Holder(%)		Total
	IV	V		Yes	No	
Hemorrhage	21(57)	16(43)	37(41.1)	14(37.8)	23(62.2)	37(41.1)
Sepsis	9(56.2)	7(43.8)	16(17.8)	8(50)	8(50)	16(17.8)
Eclampsia	7(87.5)	1(12.5)	8(8.9)	5(62.5)	3(37.5)	8(8.9)
Ruptured Uterus	2(66.7)	1(33.3)	3(3.3)	2(66.6)	1(33.3)	3(3.3)
Obstructed Labour	3(50)	3(50)	6(6.7)	3(50)	3(50)	6(6.7)
Abortion	2(66.7)	1(33.3)	3(3.3)	1(33.3)	2(66.7)	3(3.3)
Anaemia	6(42.9)	8(57.1)	14(15.6)	8(57.1)	6(42.8)	14(15.6)
Others	1(33.3)	2(66.7)	3(3.3)	0(0)	3(100)	3(3.3)
Total	51(56.7)	39(43.3)	90(100)	41(45.6)	49(54.4)	90(100)

Discussion

Our study revealed that majority of the maternal deaths was occurring in the age group of 22-29 (57.8%) years**.** A study from U.P and other states found that half of the mothers dying were aged below 25 years.[9] Majority of the mothers who died belonged to poor socio-economic class. Poor socio-economic characteristics increases risk of maternal death. [10]In our study 45.6% women had BPL card. It shows that even those who had BPL card didn't know the maternal health care benefits through this card. The study from West Bengal using MAPEDIR revealed that about 41% of the families had a BPL card and rest 34 % of the families did not knew the maternal health care benefit.[11]

Husbands lack of education was seen in majority of the mothers dying from Hemorrhage, Eclampsia, Obstructed Labour, ruptured uterus, abortion related complication. This reflects that lack of husband education may impede decision making for health seeking and such mothers die from life-threatening emergencies because of lack of timely decision. Several studies have shown that poor education status is associated with high risk of maternal death.[9,12,13]

Hemorrhage was the most important biomedical cause of death (41.1%) This is in concordance with the disease-specific maternal mortality picture of India and worldwide.[14,15] Hemorrhage, sepsis and Anemia were the leading cause of maternal death amongst mother aged ≥22 years. It was seen that these mothers age of first conception was ≤ 21 years and were multi gravida. Repeated uncared pregnancies are an important risk factor for development of anemia, sepsis and Hemorrhage.[16] It was seen that majority of the women (71%) who died of anemia related complication were illiterate. A prospective community based study also found that anemic women were more likely to have no formal education.[17]

Conclusion

We conclude that those mothers with illiteracy, poverty, early age of conception are reported with higher number of maternal deaths. Mothers and their family should be made aware of benefits through BPL card. This section of society still continues to face the farce of maternal deaths and thus ensuring that these mothers receive appropriate maternal care despite of their bio-social barriers is the need of the hour.

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