

INFANT MORTALITY ASSOCIATED WITH SOCIOCULTURAL RISK FACTOR IN MUZAFFARPUR, BIHAR- HOSPITAL-BASED LONGITUDINAL STUDY

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ABSTRACT

BACKGROUND

Infant mortality is due to interaction of several factors in combination. The sociocultural factors play a major role in infant mortality.

MATERIALS AND METHODS

Design- Non-interventional, hospital-based, longitudinal study.

Setting- Obstetrics and Gynaecology and Paediatric Department of S.K.M.C.H., Muzaffarpur, over a period of February 1, 2016, to January 31, 2017.

Participant- Infants born and/or admitted in S.K.M.C.H., Muzaffarpur.

Sampling Technique and Sample Size- Simple random sampling method was used to select 275 samples for study.

Statistical Analysis- Percentage, proportion, Chi-square test were performed.

RESULTS

Among 275 selected infants, mortality was highest 71 (56.8%) when the maternal age of delivery was <18 years. There was more significant statistical association ($P<0.05$) between age of delivery and infant mortality. Infant mortality was highest 78 (62.4%), whose mother had visited once for A.N.C. and infant mortality was lowest 10 (8%) who had received more than 3 A.N.C. statistical association was more significant ($P<0.05$) between A.N.C. and infant mortality. Infant mortality was highest 79 (63.2%) in illiterate mother and lowest 5 (4%) among higher secondary and above educated mother and it also indicated more significant statistical association ($P<0.05$). Infant mortality was highest 68 (54.4%) in schedule caste and lowest 60 (12.8%) in general class. It was also statistically significant ($P<0.05$). Infant mortality was highest 83 (66.4%) in Hindus and lowest 6 (4.8%) in others and indicated more significant statistical association. Infant mortality was highest 77 (61.6%) when delivery conducted by untrained birth attendant and it was lowest 3 (2.4%) when doctor was assisted. It also indicated more significant statistical association ($P<0.05$). Infant mortality was lowest 25 (20%) in exclusive breastfed infants and highest 56 (44.8%) in formula fed infants and it was highly significant statistical association ($P=0.0001$). Infant mortality was comparatively high 78 (62%) in smoking mother than infant of non-smoking mother had 47 (38%) and it was highly significant statistical association.

CONCLUSION

In this study it was seen that the sociocultural factors were the major determinant risk factors for infant mortality. Among these, maternal smoking habit was the commonest factor followed by feeding practice, delivery practice, A.N.C., education, religion, caste and age of delivery. Higher incidence of these contributing factors illustrates the government and other health providers to strengthen the surveillance of infant morbidity and mortality and make strategies for prevention, control and reduction of infant morbidity and mortality.

KEYWORDS

Infant Mortality, Sociocultural Risk Factors, A.N.C., T.B.A., Exclusive Breastfeeding, Age of Delivery, Maternal Education, Maternal Smoking.

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BACKGROUND

Infant mortality refer to deaths of young children typically, those less than one year of age. It is measured by the Infant Mortality Rate (IMR), which is the number of deaths of under one year of age per 1000 live births. Infant mortality was an indicator which was used to monitor progress towards the

fourth goals of the United Nations for the year 2015. It is now the target in the sustainable development goals as the goal number 3. Although, premature births is the biggest contributor of IMR, many factors contributed to infant mortality, such as the mother's level of education, environmental conditions and medical infrastructure. India

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has been recording decrease in infant deaths, but hasn't yet been able to meet 2012 targets (30 per 1000 live birth) set under Millennium Development Goals-2015 (MDGs) yet. Out of the 36 Indian states and United Territories (UTs), the lowest IMR were reported from Goa and Manipur, that was 9/1000 live birth. In contrast, Madhya Pradesh reported India's highest IMR with 50/1000 live births. Uttarakhand was the only state that reported a worsening in its IMR from 33/1000 live birth in 2014 to 34/1000 live birth in 2015. N.R.H.M. (National Rural Health Mission) launched in 2005, had set India's IMR target as 30 deaths per 1000 live births to be achieved by 2012. However, we have still not been able to achieve it even in 2017. India has reduced its IMR by 53% over 25 years instead of the desired 67%, which it has set in its MDG target. The MDG achievements of 2015 set the base for 2030 sustainable development goals (SDGs). While infant mortality is not a target, the SDGs will monitor neonatal mortality. Neonatal mortality largely stems from poor maternal health, inadequate antenatal care, improper management of pregnancy complications and delivery-related complications. In 2013, neonatal mortality contributed to 68% of all infants deaths in India and it will continue to represent an increasing proportion of child deaths.¹ N.F.H.S.-4 (National family health survey-2015-16) has reported mothers who had at least 4 antenatal care visits was 51.2%, full antenatal care 21%, institutional birth (78.9%), birth assisted by a doctor/nurse/LHV/ANM/other health personnel (81.4%) and children age 6 monthly exclusively breastfed (54.9%).² In Bihar, IMR declined from 56/1000 live births in 2008 to 43/1000 live births in 2012.¹ The IMR of Muzaffarpur district was 55/1000 live birth in 2013.³ However, infant mortality is commonly due to interaction of several factors happening in combination.⁴ The sociocultural factors plays a major role in infant mortality. In this context, our study will reflect the attention of government as well as health policy planners to make strategies and also to take appropriate actions for reduction of infant mortality in Muzaffarpur district.

This study has been designed with the following aim and objectives.

Aim and Objectives

- To identify the sociocultural risk factors of infant mortality.
- To describe the distribution and magnitude of sociocultural risk factors of infant mortality.
- To provide the data essential to the planning, implementation and evaluation of services for prevention, control and reduction of infant mortality

and to the setting up of priorities among those services.

MATERIALS AND METHODS

- **Study Design-** A non-interventional, hospital-based, longitudinal study.
- **Sampling Technique and Sample Size-** A simple random sampling method was used to select the infants born in Obstetric and Gynaecology Department, and/or admitted in Paediatric Department, S.K.M.C.H., Muzaffarpur. 275 samples were selected for study. The tools were checked for accuracy and consistency. The pilot testing was done prior to selection of sample.

Inclusion Criteria

- Only those infants born and/or admitted in S.K.M.C.H., Muzaffarpur, were selected for study.
- Only susceptible infants (infants capable of being affected by sociocultural factors) were selected.

Exclusion Criteria

- Seriously ill infants were excluded.
- Migrant and who had not documented residential proof of Muzaffarpur were excluded.
- Parents/guardians/attendants who didn't give any informed consent.

Duration of Study

The study was carried out during February 1, 2016, to January 31, 2017.

Data Collection Techniques and Tools

The data (target population) were collected using a structured questionnaire regarding sociocultural characteristics - age of delivery/early marriage, A.N.C. visit, maternal education, caste, religion, smoking habit, birth attendant and feeding practices and its outcome and knowledge regarding A.N.C., exclusive breastfeeding and other different outcome of infant morbidity and mortality.

Sources of Information

The study was carried out with the help of faculties of Obstetrics and Gynaecology and Paediatric Department, paramedical workers, ASHAs, hospital records and after voluntary and informed consent of parents/guardians/attendants was interviewed using a common proforma.

Statistical Methods

Data obtained from the survey were compiled, tabulated and subjected to statistical analysis. Data entry and analysis was centralised and performed at the Department of Community Medicine, Sri Krishna Medical College, Muzaffarpur. Tests of significance has been applied whenever necessary to establish the association of various risk factors. The finding has been interpreted according to draw meaningful conclusions.

RESULTS

Infant mortality was highest 71 (56.8%) when the maternal age of delivery was below 18 years. In maternal age group 18-20 years, infant mortality was 26 (20.8%) and between 21-25 years, it was 19 (15.2%). It indicates the more significant statistical association given in Table 1.

Age of Delivery	Live birth (n=275)	Percentage of Live birth	Death	Percentage of Death
<18 years	123	44.8	71	56.8
18-20 years	84	30.5	26	20.8
21-25 years	32	11.63	19	15.2
26-35 years	36	13.09	9	7.2

Table 1. Early Marriage/Age of Delivery

$\chi^2 = 9.06$; d.f. = 3; $P=0.0285$.

Infant mortality was lowest 10 (8%), when mother had received more than 3 A.N.C. and it was highest 78 (62.4%) who had visited once for A.N.C. Infant mortality was 37 (29.6%), who had received A.N.C. two times given in Table 2.

A.N.C. Visit	Live Birth (n=275)	Percentage of Live Birth	Death	Percentage of Death
One time	148	53.8	78	62.4
Two times	74	25.9	37	29.6
>3 times	53	19.2	10	8

Table 2. A.N.C. Visit

$\chi^2 = 8.28$; d.f. = 2; $P=0.0159$.

Infant mortality was highest 79 (63.2%) in illiterate mother. Infant mortality was 31 (24.8%) in primary school educated mother and 10 (8%) in secondary school educated mother. It was lowest 5 (4%) in higher secondary and above educated mother. It had more significant statistical association given in Table 3.

Maternal Literacy	Live Birth (n=275)	Percentage of Live Birth	Death	Percentage of Death
Illiterate	130	47.3	79	63.2
Primary education	82	29.9	31	24.8
Secondary school education	43	15.7	10	8
Higher secondary and above education	20	7.2	5	4

Table 3. Maternal Literacy

$\chi^2 = 10.15$; d.f. = 3; $P=0.017$.

Infant mortality was highest 68 (54.4%) in schedule caste. In backward class, it was 41 (32.8%). In general class, it was lowest 16 (12.8%) given in Table 4.

Caste of Respondent	Live birth (n=275)	Percentage of Live Birth	Death	Percentage of Death
General	66	24	16	12.8
Backward	90	32.7	41	32.8
Schedule Caste	119	43.3	68	54.4

Table 4. Caste of Respondent

$\chi^2 = 7.53$; d.f. = 2; $P=0.02$.

Infant mortality was highest 83 (66.4%) in Hindus, 36 (28.8%) in Muslim and very low in others 6 (4.8%) given in Table 5.

Religion of Mother	Live Birth (n=275)	Percentage of Live Birth	Death	Percentage of Death
Hindu	153	55.63	83	66.4
Muslim	84	30.54	36	28.8
Other	38	13.81	6	4.8

Table 5. Religion of Mother

$\chi^2 = 8.13$; d.f. = 2; $P=0.0172$.

Infant mortality was very high 77 (61.6%) when delivery was conducted by untrained birth attendant. It was 45 (36%) when delivery assisted by trained birth attendant.

Delivery Assisted By	Live Birth	Percentage of Live Birth	Death	Percentage of Death
Untrained birth attendant	162	58.9	77	61.6
T.B.A.	82	29.83	45	36
Doctor	31	11.27	3	2.4

Table 6. Delivery Practice

$\chi^2 = 9.4$; d.f. = 2; $P=0.0106$.

Infant on exclusive breastfeeding had lowest mortality 25 (20%) and infants on formula feed had 56 (44.8%) mortality. Infants on cow's milk or other feed had 44 (35.2%) mortality. It indicates highly significant statistical association, Table 7.

Feeding Practice	Live Birth	Percentage of Live Birth	Death	Percentage of Death
Exclusive breastfeed	137	49.81	25	20
Formula feed	84	30.54	56	44.8
Cow's milk/other	54	19.65	44	35.2

Table 7. Feeding Practice

$\chi^2 = 32.35$; d.f. = 2; $P=0.0001$.

Infant of smoking mother (smoke average 10 bidi or cigarette per day) had very high mortality 78 (62%) compared to infant of non-smoking mother had 47 (38%) mortality given in Table 8.

Habit	Live Birth (n=275)	Percentage of Live Birth	Death of Infant	Percentage of Death
Smoking mother	85	31	78	62
Non-smoking mother	190	69	47	38

Table 8. Maternal Smoking Habit

$\chi^2 = 35.3$; d.f. = 1; $P=0.00$.

DISCUSSION

On analysing the data, it was observed that out of 275 infants, morbidity and mortality was found in 125 infants. Infant mortality rate was 45/1000 live births, which was slightly higher than first post report and lower than A.H.S. report.^{1,2} On review of the data, smoking habit in mother was a surprising risk factor which had highly significant association ($P=0.00$) with infant mortality. These facts support the findings of Wing Tam et al and Joanne Kartz et al^{5,6} who documented that the infant of smoking mother had higher mortality than infant of non-smoking mother. On review of the overall sociocultural factors, there was significant statistical association between infant mortality and sociocultural factors. This fact support the statement as mention in K. Park - "infant mortality is due to interaction of several factors in combination."⁴ On further analysis of data it was observed that sociocultural factors are major risk factors for infant mortality, among these smoking habit was the commonest risk factors ($p=0.00$) and had a highly significant statistical association followed by feeding practices ($p=0.0001$), delivery practices ($p=0.0106$), A.N.C. ($P=0.0159$), maternal education ($P=0.017$), religion ($P=0.0172$), caste ($P=0.02$) and age of delivery ($P=0.0285$). There are many indicators used in N.F.H.S. 4 and A.H.S. (2012-13) for monitoring the health status of the community of a country. But, there are some areas which lack information. So, there is a need to use such tools that can directly measure the magnitude and distribution of such risk factors that are directly or indirectly responsible for the morbidity and mortality. The higher risk of sociocultural factors observed in the present study calls for immediate scrutiny by health planners, administrators and those who are engaged in health development. It also calls for an urgent action and evolving a strategy to further reduce morbidity and mortality in infants from the current levels.

CONCLUSION

On study of 275 infants, morbidity and mortality was significantly associated with sociocultural risk factors. This study further reveals that maternal smoking habit was the commonest risk factor among these sociocultural factors followed by feeding practice, delivery practice, A.N.C., education, religion, caste and age of mother at time of delivery delivery. Higher incidence of these contributing factors illustrates the government and other health providers to strengthen the surveillance of infant morbidity and mortality and make strategies for prevention, control and reduction of infant morbidity and mortality.

RECOMMENDATIONS

- There is a need to improve the knowledge regarding exclusive breastfeeding, good delivery practices, importance of regular A.N.C. and special attention to avoid smoking during pregnancy.
- To ensure institutional delivery and to ensure delivery assisted by T.B.A. and/or doctor.
- Antenatal visits should be started as soon as one is detected to be pregnant and frequently (every week) in later months of pregnancy. At least 3 ANC's is a must for all pregnant ladies and it should be ensured.

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