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Infant Mortality and Infant-Care Practices in the Rural Field Practice Area of JNIMS, Manipur: A Cross-Sectional Study

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ABSTRACT

Background: In spite of the weak health care delivery system, the Infant Mortality Rate (IMR) of the state of Manipur as reported in the Sample Registration System Bulletins has been consistently very low (≈11 per 1,000 live births) for the last five years or so. This warranted a study to re-affirm it and also to explore the important reasons of why and how the IMR could be brought down to very low levels. Objectives: The study objectives were to make an estimate of IMR in the Rural Field Practice Area (RFPA) of JN Institute of Medical Sciences, Manipur and also to assess the important infant-care practices starting from before the child is born till infancy. **Methods:** A community-based cross-sectional study was done in the RFPA of JNIMS during Sept-Oct 2018. Using a pre-tested semi-structured and semi-open interview schedule that had sections on socio-demographic profile, details of infant deaths and infant-care practices starting from ante-natal visits, information were collected from a scientifically calculated sample size of 150 women who had live births in the last one year prior to the study, immaterial of the survival status of the infant. Data collected were analysed and presented by using descriptive statistics. **Results:** Not even a single infant died in the last one year. Better infant care practices were seen in the study area when compared to the latest NFHS-4 Report for the state of Manipur. Some of these important better practices were pregnant women having ≥ 3 ANC visits (98%), institutional delivery rate (94%), conducting home deliveries by skilled health personnel (22.2%), exclusive breastfeeding rate (77.3%) and proportion of infants aged 6-12 months adequately fed (35%). **Conclusion:** The estimated IMR in the study area was zero. The better infant-care practices prevailing in the study area might have averted infant deaths.

Keywords: Child-feeding, Exclusive breastfeeding, Infant-care practices, Infant Mortality Rate.

INTRODUCTION

Infant Mortality Rate (IMR) is one of the important indicators for measuring the health status of any country. For India, too it was one of the three key indicators for the Reproductive and Child Health (RCH) Program in addition to Maternal Mortality Ratio and Total Fertility Rate. The RCH program set a goal of reducing the country's IMR to 30 per 1,000 live births by the year 2010.[1] But, by the end of the program period it remained at a whooping figure of 44 which could be lowered marginally in the successive years. The IMR figure reported as per the latest Sample Registration System (SRS) Bulletin is 34.[2-6] These mortality figures reported by the Registrar General of India are assumed to be much more accurate than what are reported by the National Family Health Survey (NFHS) because of the much larger sample size covered in SRS. Nevertheless, the NFHS gives valuable information regarding the health practices.[7]

Regarding the state of Manipur, the IMR if the SRS data are relied upon, is much below than the national figure and has been hovering around 10-11 per 1,000 live births since 2011. In other words, Manipur has already achieved the RCH goal a decade ago. Now, this seemingly achieved goal is in spite of the weak healthcare infrastructure system as reflected by non-availability of specialists, especially paediatricians in almost all the Community Health Centres and many of the District Hospitals which are considered to be referral centres for managing sick children.[8] The brunt of managing very sick children lies with the two teaching medical institutions (JNIMS and RIMS) existing in the state and a few private hospitals/clinics which are located in the capital city of the state. Now, the question arising is "Can the IMR be brought down drastically in spite of a weak health care infrastructure?" If so, why not this cost-

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efficient model be replicated in other states/union territories of this resource-constraint country? Or, what are the factors which prevails in the state that could reduce the infant and under-5 mortality rate out of the proven factors like exclusive breast feeding, correct complementary feeding, clean delivery, TT vaccination, Measles vaccination etc.?[8] Hence, it was felt to explore the infant-care practices being deployed in the state.

Objectives:
The present study was conducted to make an estimate of IMR in the Rural Field Practice Area (RFPA) of the Jawaharlal Nehru Institute of Medical Sciences (JNIMS). The study further aimed to assess the important infant-care practices which might be associated with low infant mortality in the same area.

MATERIALS AND METHODS

As a part of the learning activities of the internee doctors' posting in the Department of Community Medicine for two months, a community-based cross-sectional study was conducted during September-October 2018 in the RFPA of JNIMS which was situated in Imphal West district, 16 km. away from the institute. It had a Community Health Centre (CHC Wangoi) and two Primary Health Centres (PHC Samurou and PHC Mayang Imphal) along with their catering villages. Mothers who had live births in the past one year prior to the study were the study-population, immaterial of whether the child was still surviving or death. Those who could not be contacted on two visits by the research team and those who refused to participate in the study were the exclusion criteria used. Based on the IMR of 11 per 1,000 live births for the state of Manipur[6] and all allowable error of 1.7 at a confidence limit of 95%, a sample size of 145 was calculated which was rounded to 150. The sampling method consisted of two steps. First, one half of the existing villages in the RFPA were selected by using simple random sampling. This was followed by convenience sampling of all eligible study-subjects in the selected villages. Simple random sampling was not possible as reliable line-listing of all the live-births in those villages was not available nor it could not be done during the short period of the study. Rather, guidance from the local Accredited Social Health Activists (ASHAs) were sought to identify households which had women who delivered in the past one year to enhance the study progress.
The trained internees collected data by themselves. A pre-designed, pre-tested, semi-structured and semi-open interview schedule was used for data collection. The interview schedule had three parts viz. socio-demographic profile of the study-participants, details of infant deaths, if any and infant-care practices starting from ante-natal care. Informed verbal consent was obtained from each of the study-participants before the interview. There was no very sensitive question.
SPSSv20 was used for data analysis. The data are reflected descriptively in terms of means, standard deviation (SD) and proportions.

RESULTS

Completed data sets could be collected from 150 eligible mothers. There was no refusal. Their mean (SD) age was 27.45 (5.63) years ranging from 18 to 42 years. By religion 92 (61.4%) of them were Hindus, 44 (29.3%) being Muslims and the remaining 14 (9.3%) belonging to other types of religions. Majority of them 61 (40.7%) were class XII passed, 57 (38%) matriculate and only a small portion (6;4%) being illiterates. More than three fourths of them (116; 77.3%) were home-makers; 19 (12.7%) doing small-time business while the remaining 15 (10%) were government employees. Most of them (141; 94%) belonged to better socio-economic status families (according to modified BG Prasad scale, 2018) earning at least Rs. 6,528/- per month.
More than one-third of the study-subjects (58; 38.7%) were of parity 2, another one-third (49; 32.7%) being Para 3, a small portion (17; 11.3%) belonging to Para 4 and above while the remaining 26 (17.3%) were primiparas. Among the mothers who had more than two pregnancies in their life-time 48 (32%) had a gap of at least three years between the last two pregnancies. [Table 1]

Table 1: Socio-demographic profile of study-subjects (n=150)

Characteristic	No. of mothers (%)
Educational status	
Illiterate	6 (4.0)
VIII	26 (17.3)
Matriculate	57 (38.0)
≥ XII	61 (40.17)
Occupation	
Home-maker	116 (77.3)
Govt. employee	19 (12.7)
Small-time business	15 (10.0)
Monthly family income (Rs.)	
≤ 3,263	1 (0.7)
3,264-6,527	8 (5.3)
≥ 6,528	141 (94.0)
Parity	
Primi	26 (17.3)
Para 2	58 (38.7)
Para 3	49 (32.7)
≥ Para 4	17 (11.3)
Gap between last 2 pregnancies (in years)	
NA (primigravidae)	65 (43.3)
1-2	20 (13.3)
2-3	17 (11.3)
≥ 3	48 (32.0)

Not even a single case of infant death was reported by the study-subjects. Regarding infant-care practices (a process which starts before the child is

born) almost all of them (149; 99.3%) had Ante-natal check-up (ANC) visits. But the proportion came down to 98% if counted for those who had at least three ANC visits. During the ANC visits, full body examinations (BP checking, weight measurement and abdominal examinations considered as proxy indicators) were done for all the women who had ANC visits. Basic blood and urine investigations also were done to all the women who had ANC visits. Almost half of them (71;47.7%) had other investigations like ultrasonography, thyroid function test, kidney function test and other serological tests. Tetanus Toxoid (TT) 2/B coverage among all the study-subjects were quite high (136; 90.7%). Iron and Folic Acid tablets were provided to 146 (97.3%) of all the study subjects; but only 118 (78.7%) women consumed them for three months or more. [Table 2]

Table 2: Ante-natal care practices (n=150)

Practices	No. of study-subjects (%)
ANC visits	
Yes	149 (99.3)
No	01 (0.7)
No. of ANC visits	
Nil/< 3 times	3 (2.0)
≥ 3 visits	147 (98.0)
Physical examination done	
Weight recorded	149 (99.3)
BP measured	149 (99.3)
Abdominal examination done	149 (99.3)
Investigations done	
Blood test	149 (99.3)
Urine test	149 (99.3)
Other tests (USG, TFT, KFT, Serology)	71 (47.7)
Interventions received	
No or TT 1 only	14 (9.3)
TT 2/B	136 (90.7)
IFA provided	146 (97.3)
IFA consumed for ≥ 3 months	118 (78.7)

Table 3: Practices at home delivery (n=9)

Practices	No. of mothers who had home delivery (%)
Attendance at delivery	
Skilled personnel	2 (22.2)
Trained TBA	2 (22.2)
Untrained TBA	5 (55.6)
Clean practices	
Clean surface	8 (88.8)
Clean hands	3 (33.3)
Clean blade	8 (88.8)
Clean thread	8 (88.8)
Clean cord stump	7 (77.7)
Room temperature during delivery	
Warm	9 (100)

A total of 141 (94%) of the study-subjects had institutional delivery for the last child. Out of the remaining nine women who had domiciliary delivery 2 (22.2%) the delivery was conducted by skilled persons (doctors/nurses) while the remaining seven (77.8%) were conducted by traditional birth attendants. For these nine home delivery cases 8 (88.8%) used clean surface, blade and thread. Sterile gloves were used only in 3 (33.3%) cases. No medication was applied on the cord stump in 7 (77.7%) cases. During the delivery process the room temperature was kept warm in all the cases. [Table 3]

The various modes of delivery for the 150 study-subjects were Normal Vaginal Delivery (104; 69.3%), Assisted Vaginal Delivery (4; 2.7%) and Caesarean Section (42; 28%). There were three twin deliveries. More than four-fifths of the mothers (132; 86.3%) were aware of the newborns' weight taken. There was only one newborn delivered at a private clinic who did not cry immediately after birth. It was resuscitated almost immediately by a child specialist and the child started crying after three minutes. Only one sick newborn (Erb's palsy) was needed referral to a teaching medical institute by the medical officer of a Primary Health Centre. The child reached the referral centre within one hour and treatment was started on the same day within few hours.

Out of the 141 women who had institutional delivery, only one-third (50; 35.4%) were discharged after 48 hours while a majority (76; 54%) were discharged within 24-48 hours.

Regarding post-natal care practices, breastfeeding was initiated within the first hour of life by a majority of the mothers (92; 61.3%). Colostrum was given to the newborn by almost all the mothers (146;97.3%). The frequency of breastfeeding was ideal for more than half of the mothers (85; 56.7%). Pre-lacteal feeds were given by four mothers (2.7%) out of whom, three mothers used feeding bottles. The newborn baby was kept warm by all the mothers. But washing of the nipple and areola before feeding the newborn was practiced only by a small proportion of mothers (27; 18%). [Table 4]

Table 4: Post-natal care practices

Practices	No. of mothers (n=150)
Breastfeeding	
Initiated within first hour	92 (61.3)
Colostrum given	146 (97.3)
≥ 8 times in 24 hours	86 (56.7)
Pre-lacteal feeds given	4 (2.7)
Use of feeding bottles	3 (2.0)
Washing nipple & areola before breastfeeding	27 (18.0)
Keeping baby warm	150 (100)

Two-thirds of the infants (116; 77.3%) were exclusively breastfed for the first five months of life. But complementary feeding was started late by majority of the mothers (46%) while a sizeable number of the mothers started it too early (24; 16%). Good quality feeds in sufficient quantity per feed in adequate frequencies per day were given to the infants by at least 38 (35%) study-women. Hands or spoons were usually used for feeding the child (147; 98%). But hand-washing with soap and water before preparing infant-feeds was practiced by less

than half of the study-women (73; 48.7%). A small proportion of mother (8; 5.3) used to change the usual feeds when infants got sick. [Table 5]

Table 5: Infant care practices (n=150)

Practices	No. of mothers (%)
Exclusive breastfeeding for 5 months	116 (77.3)
Initiation of complementary feeding	
Before 6th month	24 (16.0)
At 6th month	57 (38.0)
After 6th month	69 (46.0)
Usual feeds	
Good quality	89 (59.3)
Adequate quantity per feed	141 (94.0)
Enough frequency per day	38 (35)
Mode of feeding	
Hand/ spoon	147 (98.0)
Feeding bottle	3 (2.0)
Hand-washing before preparing feeds	73 (48.7)
Change in feeding during illness	8 (5.3)

There was no reported serious illness among the infants which necessitated referral to referral centres. Out of all the infants aged nine months or more (56) measles vaccination have been received by 35 of them (62.5%). All the mothers were aware of the presence of Angawadi Centres in their villages. But only 15 (10%) mothers used to take their infants to the centres, that also usually once in a month and still a smaller proportion of them (10; 6.7%) received edible food items.

DISCUSSION

Not even a single infant death could be detected in the present study. Probably it might reflect the true reality in the study area. On the other hand, there may be other reasons which could have masked any infant deaths. The first factor may be associated with the deployment of ASHAs as guides for tracing women who had live births in the last one year. It is a well known fact that the ASHAs are social activists working for the cause of improving health and one of their important roles is to mobilize people to seek health care so that maternal and children deaths could be averted. Because of this reason they might be reluctant in showing families where there were infant deaths. Showing them might hurt their pride. Also, in the study-area the myth of infant deaths considered as churein (evil spirit coming to kill the parents) was persisting. As such, mothers are forced not to have sympathy for the death infant. Rather they are compelled to forget any such deaths. This might have rendered the ASHAs not to visit such families in the fear that visiting them may rekindle those unwanted memories. Using a convenience sampling method for selecting the eligible women might have also minimized the probability of finding infant deaths.

In spite of these limitations, we found better infant care practices in the study area if compared to the latest NFHS-4 Report for the state of Manipur.[7] These better practices might have averted infant deaths in the study are. Notables among these factors are having ≥ 3 ANC visits (98%), institutional delivery rate (94%), conducting home deliveries by skilled health personnel (22.2%), exclusive breastfeeding rate (77.3%) and proportion of infants aged 6-12 months adequately fed (35%) as compared to the latest NFHS Report figures of 69%, 69.1%, 22.2%, 73.6% and 14-19% respectively.[7] All these factors are proven to increase child survival.[9,10] These improved practices clustered with a very high mothers' literacy rate of 96% in the study area might have resulted to zero infant deaths in the study area. The presence of ASHAs and their efforts might have also helped for the cause.[11]

Some alarming findings were also noted from the current study. First one is related with the socio-demographic profile of the study-women regarding their parity and gravida. Out of a total 65 women pregnant for the first time, only 26 (40% of 65) had progressed to give births implying a huge pregnancy wastage rate. This might be because of many unwanted pregnancies which were later terminated reflecting high unmet need of contraceptives. This warrants further research. Secondly, the Caesarean section rate has gone up from 21% in 2016 to 28%,[7] the reasons may need to be clarified through further studies. Thirdly, the proportion of breastfeeding initiated within the first hour of life has gone down to 62.5% from the state figure of 74.2% as found out through the above mentioned survey in 2016. Lastly, information bias might have crept in when the mothers talked about the various practices assessed in the present study.

The visible reduction in Measles vaccination coverage might be because of the fact that in NFHS it is calculated among children aged 12-23 months whereas in the current study the coverage rate reflected was among infants aged 9-12 months. As younger children were accounted for in the current study and as the primary vaccines can be administered up-to 12 months, the coverage rate is probably under-estimated.

CONCLUSION AND RECOMMENDATIONS

No infant mortality could be seen among women who delivered in the last one year. Better infant care practices were seen in the study area if compared to the latest NFHS-4 Report for the state of Manipur. Some of these important better practices were pregnant women having ≥ 3 ANC visits (98%), institutional delivery rate (94%), conducting home deliveries by skilled health personnel (22.2%), exclusive breastfeeding rate (77.3%) and proportion of infants aged 6-12 months adequately fed (35%).

It is proposed to have further studies with bigger sample sizes in which more robust sampling methods are used so as to get more generalizable information.

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