

## SHORT ARTICLE

**A cross sectional study on health status of infants in rural areas of Kamrup, Assam**Madhur Borah<sup>1</sup>, Rupali Baruah<sup>2</sup>, Kanika K Baruah<sup>3</sup><sup>1</sup>Senior Resident Doctor, Dept of Community Medicine, NEIGRIHMS, Meghalaya, <sup>2</sup>Professor and HOD, <sup>3</sup>Associate Professor, Dept of Community Medicine, Guwahati Medical College, Guwahati, Assam

<a href="#">Abstract</a>	<a href="#">Introduction</a>	<a href="#">Methodology</a>	<a href="#">Results</a>	<a href="#">Conclusion</a>	<a href="#">References</a>	<a href="#">Citation</a>	<a href="#">Tables / Figures</a>
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**Abstract**

**Introduction:** Infancy is the period of growth and development of a child. Inadequate care, malnutrition and infections in this crucial period lead to high neonatal and infant deaths and also high prevalence of morbidities. But data on childhood and infant mortality and morbidities are still not adequate in North Eastern part of India, so this cross sectional study was initiated. **Objectives:** To assess the nutritional status and morbidity profile of infants and to study the associated socio-economic factors. **Material and methods:** Total 450 singleton infants under 1 year of age in 30 cluster villages were selected for the study. Data collected about socioeconomic condition of the family, infants' nutrition and morbidity status and anthropometric measurements were done. **Results:** Out of 450 infants 24% were found to be underweight while 13.3% were stunted and 7.1% were wasted. Female infants were found to be more malnourished. A statistically significant association was found between gender and nutritional status. ARI (20%) and Diarrhoea (14%) were the most common morbidities among the study population and 6 to 8 months age group was the most vulnerable for these common morbidities. **Conclusion:** the study revealed that high percentages of the infants were suffering from malnutrition with female predominance and respiratory diseases, diarrhoea and malnutrition were the major causes of morbidity during the first year of life.

**Key Words**

Infancy; Malnutrition; ARI; Diarrhoea

**Introduction**

Infancy is one of the most crucial periods for growth and wellbeing of a child. Good nutrition, immunization and care during infancy lead to proper growth of the child as well as reduction of mortality and morbidity. Assam has the highest maternal death rate (328) in India (1), also has a high prevalence of anaemia (66% suffering from moderate or severe anaemia) in pregnancy (2) and high prevalence of child malnutrition (52% stunting, 36% underweight) (3), which directly reflects in low birth weight of new born leading to high neonatal and infant deaths and also high prevalence of childhood morbidities and mortalities (4). But data

on childhood and infant mortality and morbidities are still not adequate as there are few community based studies conducted in this region regarding this issue.

**Aims & Objectives**

1. To assess the nutritional status and morbidity profile of the infants.
2. To study the associated socioeconomic characteristics of the study population.

**Material and Methods**

The present study had been undertaken in the Boko-Bongaon Development Block, Kamrup district Assam. Boko-Bongaon Development Block is a rural

block situated about 85 km west of Guwahati city. The block comprises of 140 villages spreading over total 27232 hectare. The total population of the block was 99,935 (2011 census). Majority of the population were tribal. Rabha, Bodo-kachari and garo were the tribes distributed throughout the block. Majority of the population was dependent on agriculture and paddy cultivation was the main crops in the area. The majority of the population belonged to lower and lower middle socio economic class. The study period was from January 2013 to August 2013. Total 450 infants up to 1 years of age were selected for the study through cluster sampling method. For sampling we had taken the prevalence of diarrhoea as 18% according to NFHS 3 data 5 (applying the formula  $4pq/L2$  taking relative error of 20% of p). Accordingly, a house to house survey was conducted in 30 cluster villages. From each cluster 15 eligible infants were selected.

**Inclusion criteria:** All singleton infants, whose parents were permanent residents of the study area and whose parents gave verbal informed consent to be part of the study

**Exclusion criteria:** Multiple births, those infants whose birth weight was not known, infants with major congenital malformations, severe birth asphyxia and chromosomal anomalies were excluded from the study.

Data were collected about socioeconomic condition of the family, infants' nutrition and morbidity status, weight and length were measured for all infants. A Pre designed Pre-tested semi structured schedule was developed keeping in mind the study objectives and schedule was pre tested in a village of the same block with 25 infants. Also digital weighting machine, infantometer were used for data collection. Available medical record of the baby i.e. hospital discharge certificate, doctor's prescription, immunization card, laboratory report etc were also examined. In case of non-availability of medical records parents were asked about any morbidity of the infant during the previous 2 weeks period and also verified with local ASHA and ANM. Morbidities of the infants considered for the study were: Acute diarrhoea, acute respiratory tract infections, fever, ear and eye infections, skin infections. Ethical clearance was obtained from Gauhati Medical College ethics committee. Data were expressed by frequencies, proportions and percentages. Statistical analysis was done in Statistical Package for the Social Science (SPSS 17.0) software. Important definition

we used for morbidity status of the infants where there was no available medical records: Acute diarrhoea: Infant was considered to be suffering from diarrhoea if she/he passed liquid or watery stool more than three times a day or in case of young infants if the stools had changed from usual pattern and were many and watery (more watery than faecal matter) or a recent change in consistency or frequency of stool. Fever: Mother giving history of high temperature of the infants. Fever within 48 hours of taking immunization was not considered. Acute respiratory tract infection: An infant was considered to be suffering from acute respiratory tract infection when she/he had running nose, cough with or without fever, fast breathing, and difficulty in breathing with or without chest in drawing during the recall period. Ear infection: History of discharge from ear and swelling or redness in and around the ear was taken as ear infection. Skin infection: An infant was considered to be suffering from skin disease if she/he had localized skin eruption (papule, pustule), itching, umbilical redness and draining pus. Eye infection: An infant was considered to be suffering from eye infection if mother gave history of reddening of eye, watering or discharge. Recall period of 14 days was considered for the study. Immunization status unknown: when there was no immunization card and care giver could not recall whether immunization was given or not.

For assessing the nutritional status, we collected data on weight and length of the infants as well as computed "Z" scores for weight for age, length for age and weight for length indices. Z-score value "-2SD" was used as a cut-off point for prevalence estimation of underweight, stunting and wasting. (6,7)

## Results

Among the 450 infants there were 237 males (52.7%) and 213 females (47.3%). Majority of the babies belonged to the joint family (68.9%). Among the mothers 90 (20%) were illiterate while 74 (16.5%) were Higher Secondary School passed or above and majority of the mothers studied up to primary or middle school 173 (38.4%). Out of the 450 mothers 273 (60%) were Hindu by religion and 97 (21.5%) were Christians. The study also revealed that out of the 450 mothers 128 (28.4%) were teenage mothers and 65 (14.5%) were 30 years or older. Among the mothers 126 (28%) were primipara, 180 (40%) were of parity 2 and rest 32% of parity 3 or more. Very few

women (7 numbers) were unregistered for ante natal care during the pregnancy period but 34% (155 numbers) of the women had less than 4 ANC during pregnancy.

[Table 1](#) showed that out of 450 infants 108 (24%) were underweight during the study period while 13.3% were stunted and 7.1% were wasted. Among the infants maximum percentage of underweight infants were found in 6-8 months (29.1%) and 10-12 months (30%) age group. Similarly stunting was most common in 6-8 months (27.3%) age group. Wasting was most prevalent (13.3%) in the age group of 10-12 months of age. Among the males 56 (23.6%) were underweight while out of 213 females 24.4% were underweight. Similarly more numbers of female infants were stunted and wasted. A statistically significant association was found between gender and nutritional status. ([Table 2](#))

[Table 3](#) revealed that 90.5% infants' immunization status was up to date and only 2.2% infants remaining unimmunized among them while 7.3% infants' immunization status was unknown. Most numbers of unimmunized infants were found in the 0-2 month's (6.7%) age group.

During the study period respiratory tract infection was found to be the most common morbidity among the study population. 20% of the infants suffered from ARI in the last 2 weeks. ARI were found to be most prevalent (33%) in 8 to 10 months age group. Diarrhoea (14%) was the second most common morbidity among the infants. 6 to 8 months age group was the most vulnerable for diarrhoea (31%). Any fever (11.8%) and skin disorders (9.3%) were the other common morbidities ([table 5](#)). Other morbidities included eye and ear disorders, seizure and vaccination side effects ([Table 4](#)).

## Discussion

From the results of the study it was seen that a high percentage (24%) of the infants were suffering from malnutrition. NFHS 3 data also showed that malnourished infants range from 20 to 30% when underweight, stunted and wasted infants are considered.(5) More malnourished children in the 6 to 8 months age group pointed towards inadequate supplementary feeding. The study findings also revealed that malnutrition was significantly associated with female gender during infancy. Occurrence of more malnutrition among the females might be an indication of neglect of female child. Though NFHS 3 found girls and boys are about

equally undernourished. Various studies in rural areas of India had similar findings.(8,9,10)

More than 90% immunization status indicated good immunization coverage as well as active participation of the people. The morbidity profile of the infants showed that the most prevailing illness during the study period was acute respiratory tract infections. Other studies also showed similar findings.(11,12) More incidence of ARI in 6 to 8 months age group indicated association between high prevalence of malnutrition in that age group and occurrence of respiratory infections. A prospective study in rural areas of India also found that in the second 6 months of infancy, weight gain was found to be significantly hampered by various morbidities like ARI.13 Diarrhoea was the second common morbidity among the study population and it was also found to be more prevalent in the age group of 6 to 8 months age group which pointed toward inappropriate complementary feeding and malnutrition. Similar studies had also found that respiratory diseases, diarrhoea and malnutrition were the major causes of morbidity and mortality among infants.(14,15)

High percentage of teenage mothers and illiteracy might be the contributing factor for malnutrition and morbidity of infants. Various studies in India also reported illiteracy, lower socioeconomic status and religion of mother as factors associated with morbidity and malnutrition in infancy.(10, 13,16)

## Conclusion

Our study revealed that high percentages of the infants were suffering from malnutrition with female predominance and respiratory diseases, diarrhoea and malnutrition were the major causes of morbidity during the first year of life. As these infants are the future citizen of the country hence their health should be the utmost priority for us and these health needs of the infants should be properly addressed.

## Recommendation

From our study we can recommend that regular follow up of infants by trained health workers, health education to the parents and training of community level health workers will be very much helpful for improving the health of infants in rural areas.

## Limitation of the study

The study despite many limitations like single field investigator, cross sectional nature of the study, dependence on mother or care giver's memory for

collection of data, limited time duration etc, tried to throw light on the nutritional and morbidity status of the rural infants.

### Relevance of the study

Since infant mortality is still a major public health problem in India therefore the study findings regarding rural infants would be relevant to the current situation of infant health in this region of the country.

### Authors Contribution

All the authors contribute equally for successful completion of the study.

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## Tables

**TABLE 1 DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO NUTRITIONAL STATUS AND AGE IN MONTHS:**

Age in months	N (%)	Underweight (%)	Stunted (%)	Wasted (%)
<b>2-4</b>	62(100)	8 (12.9)	3(4.8)	0
<b>4-6</b>	108(100)	30(27.8)	12(11.1)	8(7.4)
<b>6-8</b>	55(100)	16(29.1)	15(27.3)	7(12.7)
<b>8-10</b>	60(100)	15(25)	12(20)	5(8.3)
<b>10-12</b>	90(100)	27(30)	18(20)	12(13.3)
<b>Total</b>	450(100)	108 (24)	60(13.3)	32(7.1)

**TABLE 2 DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO NUTRITIONAL STATUS AND GENDER**

Nutritional status	Male (%)	Female (%)
<b>Normal</b>	146 (61.6)	104 (49)
<b>Underweight</b>	56 (23.6)	52 (24.4)
<b>Stunted</b>	23 (9.8)	37 (17.4)
<b>Wasted</b>	12 (5)	20 (9.2)
<b>Total</b>	237 (100)	213 (100)

$\chi^2 = 11.223$   $p < 0.05$

**TABLE 3 DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO IMMUNIZATION STATUS**

Age in months	N (%)	Non-immunized (%)	Immunized up to date (%)	Status unknown (%)
<b>0-2</b>	75(100)	5(6.7)	58(77.3)	12(16.0)
<b>2-4</b>	62(100)	0	59(95.2)	3(4.8)
<b>4-6</b>	108(100)	1(0.9)	102(94.4)	5(4.7)
<b>6-8</b>	55(100)	0	53(96.4)	2(3.6)
<b>8-10</b>	60(100)	1(1.7)	58(96.6)	1(1.7)
<b>10-12</b>	90(100)	3(3.3)	77(85.5)	10(11.2)
<b>Total</b>	450(100)	10(2.2)	407(90.5)	33(7.3)

**TABLE 4 DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO THE MORBIDITY STATUS**

Age groups	N (%)	Diarrhea (%)	ARI (%)	Fever (%)	Skin infection (%)	Others (%)
<b>0-2</b>	75(100)	3(4)	12(16)	4(5.3)	4(5.3)	0
<b>2-4</b>	62(100)	3(4.8)	7(11.2)	5(8.06)	2(3.2)	0
<b>4-6</b>	108(100)	9(8.3)	13(12.03)	14(13)	7(6.5)	7(6.5)
<b>6-8</b>	55(100)	17(31)	15(27.3)	8(14.5)	6(10.9)	5(9)
<b>8-10</b>	60(100)	18(30)	20(33.3)	12(20)	8(13.3)	2(3.3)
<b>10-12</b>	90(100)	14(15.5)	23(25.5)	10(11.1)	15(16.7)	8(8.9)
<b>Total</b>	450 (100)	64(14.2)	90(20)	53(11.8)	42(9.3)	22(4.8)