

Low birth weight(LBW) was the major predictor of infant deaths; evidence from a prospective study in rural Bangladesh

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Abstract

The study was the part of a longitudinal study on the consequences of low birth weight babies (LBW) in three unions of Manikganj district in Bangladesh. The study aimed to estimate the infant mortality rate in the study population and to identify the causes and factors related to infant deaths. Data was collected during 1993-1994. In this study pregnant mothers were registered at the third trimester of pregnancy. After delivery birth weights of a total 644 infants were recorded. The infants received monthly follow-up visits till 1 year of age. All deaths during follow-up period were recorded. Low birth weight was identified as being the commonest factor contributing to infant deaths. Diarrhoeal disorder and ARI were major killer diseases. Poor weight gain by the mothers during pregnancy, multiparity, low education of parents, poor living condition were found to be linked with infant deaths. Detrimental feeding practices were prevalent among the mothers. It is important to provide information to all members of the community about consequences, prevention and care of LBW.

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Introduction

Child mortality is one of the most important indicators for improvement of health status and quality of life in a population. A study has indicated that lower child mortality contributes to a lower fertility rate in a population (1). While one quarter of world children live in the South Asia, 1 in every 4 children dies before reaching their fifth birthday in this area (2). Again, among the South Asian countries disparity exists regarding child mortality, for example, a child born in Sri Lanka can expect to live 72 years whereas in Bangladesh it is 55 years(2).

The estimated infant mortality rate (IMR) in Bangladesh, 77 per 1000 live births (3). It is also estimated that only in the neonatal period 60% of the infant deaths occur in rural Bangladesh (4). Although a number of studies done in Bangladesh estimated the magnitude of the problem of infant mortality, majority of these studies were retrospective in nature and used data from the vital registration system. The present study adopted a longitudinal study design to avoid the recall biases estimating the rate and causes of infant deaths and factors related to it in rural Manikganj .

BRAC has undertaken multisectoral programmes in Manikganj since 1976 adopting an integrated approach. It is important for BRAC to know whether BRAC programme have impact on child survival which is an important indicator of quality of life. This study is expected to estimate the infant mortality rate in the study population, to identify the common causes of infant death and to find the relationship between infant deaths and multiple socioeconomic, and maternal factors in the study sample.

BRAC introduced a community based primary health care (PHC) programme since 1986 in rural areas of Manikganj district. The prime objective was to improve the health and nutritional status of the rural mothers and children. This programme had 8 components as follows: oral rehydration therapy teaching(5), expanded program on immunization(6), vitamin A capsule (VAC) distribution, nutrition education, TBA training, safe water and sanitation, family planning, and basic curative services. Besides, a strategy to achieve community participation in the programme areas, mother's club and village health committees were formed. In addition to direct interventions regarding health BRAC adopted an integrated approach including nonformal education and income generating activities which is expected to have a positive impact on life expectancy, quality of life and survival.

Study Objectives

- I. To estimate the infant mortality rate, and
- II. to identify the causes and factors related to infant deaths in a BRAC program area.

Methods and materials

This was part of a prospective study investigating the consequences of low birth weight on infant growth, morbidity and feeding practices in rural Bangladesh which followed up 644 infants for one year. The study was undertaken in three unions of Manikganj District of rural Bangladesh during 1993-1994. In the study

The pregnant mothers were identified through house to house visit and they were registered at the third trimester of pregnancy. During registration, information on maternal factors such as age, reproductive history, nutritional status, education, socioeconomic status were collected. Information on housing pattern in terms of condition of floor of the living rooms, use of safe water, sanitation were also obtained. The interviewers selected one person from each of the household as informant who gave the information about birth. Birth weight of a new born baby was taken within 48 hours of delivery and at the same visit the baby was registered. A total of 644 babies were registered and received monthly follow-up visits till one year of age. During the follow up visits the growth of the baby was monitored and information on the morbidity and feeding practices were collected. Any death of the infant was recorded by verbal autopsy method using a separate questionnaire consisting structured and open ended questions. In this study pregnant women who were not the permanent resident of the research area or any pregnancy ending in still birth were excluded.

Findings

Causes and timing of infant deaths and treatment status

Of the total 644 infants, 34 infants died during the one year follow-up period. The estimated infant death rate was 53 per 1000 live births. Seventy-three percent of the infants who died during the follow up period were the low birth weight babies (Table 1). Death rate among the low birth weight infants was 63 per 1000 live

births, whereas, death rate of infants with normal birth weight was 34 per 1000 live births. Table 1 also shows that 48% of the infant deaths occurred within the neonatal period (0-29 days). Table 2 shows the specific causes of death in the study sample. It shows that diarrhoea and ARI were the most common causes of death among both the low birth weight and normal birth weight babies (Table 2). However, two of the 25 LBW babies died of malnutrition (Table 2). The cause of death of one infant, born with normal birth weight, could not be detected as the baby died suddenly. About 67% of the infants had a chest circumference of less than 300 mm at birth. Among infants who died during follow-up, 58% were females and 42% were males. Twenty-three percent of the infants did not receive any treatment before death (Table 3). Table 3 also shows that in 50% of the cases the relatives provided treatment for the infants. In 41.2% of the cases the medical assistants, in 17.6% the village doctors, and in 11.8% the MBBS doctors were consulted. The faith healers treated 23.5% of the cases and mothers themselves gave treatment in 8.8% of the cases.

Relationship between the infant deaths and maternal demographic and reproductive factors

It was found that 50% of the mothers were in the age group of 20-30 years, 29.4% were in the age group <20 years, and 20.6% were in age group of 31+. (Table 4). However, majority of the mothers (91.2%) had conceived their first child before they reached the age of 20 years. Sixty-seven percent of the mothers had

no education and another 29.4% had primary level of education. Seventy percent of the mothers were multi para mothers. Five of them had previous bad obstetric history of abortion or still birth. Table 4 also shows that 55% of the mothers weighted less than 45 kgs at the seventh month of pregnancy and another 32.3% gained just 45-50 kgs weight. However, only 5% mothers were in the high risk group considering maternal height less than 140 cm as a risk factor. Three mothers had the history of accidental fall during pregnancy. None of them got antenatal care during pregnancy, although 21 of them received TT injections. Seven mothers had their own earnings, of whom two had to work outside their home. Five mothers were habituated to chew raw tobacco.

Socioeconomic condition of the household

The commonest occupation (47%) of the household heads was day labour (Table5). The other occupations were agricultural work (26.5%), self employment (11.8%), business (8.8%), and service (5.9%). Table 6 reports that 79.4% of the households were Target Group(TG¹) and 58% of the infants' fathers were non educated. In more than 50% of the households there were only one living room (Table 6). Whereas, 67.6% of the households comprised of 3 to 5 family members and another 29.4% had more than five members. None of the families had pacca floor in living rooms. In all the households, drinking water was collected from tubewells, while 88.2% of the households did not use sanitary latrines.

¹ Target Group (TG) : A household having less than 5th decimals of land and any one aged 12 years who sell manual labour for at least 100 days a year is designated as TG.

Factors related to feeding practices

Honey was given in 55.9% of the cases as initial food after birth and only in 11.8% of the cases colostrum was fed (Table 7). Although all infants were breastfed, in 84.4% of the cases additional foods were given to the new born babies within first week of life. The additional foods given to the baby were animal milk and sugar water. Table 8 shows the reasons for giving additional foods to the baby in first week of life. The reasons were insufficient milk production (85.7%), baby could not suck (7.1%) and mother's sickness (7.2%).

Discussion

The estimated infant mortality rate of 53 per 1000 live births, in the present study is lower than the national rate (77per 1000 live births)(3) . As in the present study we recorded all infant deaths in the longitudinal study cohort, there was less chance of under or over reporting. However, the lower infant mortality rate in the programme area seemed to be attributable to BRAC's interventions in this area. The neonatal period might be the most vulnerable period for the survival of the infants. Again, 81% of the infants who died during neonatal period were born with a low birth weight. It is not unexpected because the infants with low birth weights have greater chance of dying shortly after birth. Low birth weight was identified as being the most common cause contributing to infant deaths which is consistent with the findings of other studies done in Bangladesh(4). Of total 25 LBW infants

only two were premature which means that 23 infants were small for gestational age (SGA). It can be easily understood that poor weight gain by the mothers during pregnancy can attribute to production of SGA infants. We found that 60% of the mothers weighted less than 45 kg at their seventh month of pregnancy. A study in Bangladesh also indicated that poor wait gain during pregnancy resulted in low birth weight infants(7). We found that diarrhoeal disorder and ARI, either associated with LBW or not, were the major killer diseases among infants. A number of studies also reported that diarrhoea and respiratory tract infection are two common causes of illness and death among infants in Bangladesh(8-11). In small number of cases trained personnel were consulted for the sickness of the infants. Low educational status of parents found to be linked with child mortality which is consistent with the findings of other studies done in developing countries(12-13). Education, however, is a measure of socioeconomic status and higher income ensuring better care of the child. It seems that there may be a linkage between maternal age less than 20 years at their first conception and infant deaths, this relationship should be tested in future studies. Low socioeconomic condition, multiparity, poor sanitation and crowded housing condition found to be related with infant deaths, also reported by others(14-15). Administration of prelacteal foods, rejection of colostrum and practice of giving supplementary foods in the first week of life, which are thought to be dangerous practices, were prevalent among the mothers of the infants who died.

Conclusions

Low birth weight was identified as being the commonest factor contributing to infant deaths. Diarrhoeal disorder and ARI were the major killer diseases among infants. Poor weight gain of the mothers during pregnancy might have attributed to infant deaths in the study sample. Low socioeconomic condition, poor living condition, poor sanitation, parents' illiteracy, maternal age less than 20 years at first conception, multiparity of the mothers were seemed to be related to infant deaths. Detrimental feeding practices in terms of child survival, administration of prelacteal foods, rejection of colostrum and lacking in exclusive breastfeeding practice were prevalent among the mothers of these infants who died.

Recommendations

We found that in most cases relatives tried to treat the infants. Therefore, it seems very important to inform the members of the community about the danger signs of the major killer diseases of infancy such as ARI and diarrhoea. For case management low cost curative services should be available.

All members of the community should be informed about the consequences and prevention of LBW. To improve the birth weights of the infants, distribution of nutritional supplements to identified high risk pregnant mothers can be provided.

Abolition of detrimental feeding practices such as rejection of colostrum, administration of prelacteal foods and early supplementation are essential.

Programme must educate the mothers how to take care and feed small (LBW) babies.

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Table 1

Distribution of the death cases by birth weights and timing of death

Days after birth	%		
0-29 days (neonatal)	16 (48.0)	<u>LBW</u> 13 (81.0)	<u>NBW</u> 3 (19.0)
30 days -12 months (post neonatal)	17 (52.0)	11 (65.0)	6 (35.0)
Total	33	24 (73.0)	9 (27.0)

* Birth weight of one infant was missing

L BW -Low birth weight (birth weight less than 2.5 kg)

NBW- Normal birth weight

Table 2

Distribution of death cases by birth weights and the causes of death

Causes of death	Number of the cases
<u>LBW (N=24)</u>	
LBW	12
LBW and diarrhoea	6
LBW and ARI	3
LBW and malnutrition	2
LBW and prematurity	1
<u>NBW (N=9)</u>	
Diarrhoea	4
ARI	2
Sudden death	1
Congenital mal formation	1
Intestinal obstruction	1
Total	34

Table 3

Distribution of death cases by sources of treatment received

Sources of treatment	Death cases (%) N=34
Relatives	17 (50.0)
Medical Assistant	14 (41.2)
Faith healers	8 (23.5)
Village doctors	6 (17.6)
MBBS doctor	4 (11.8)
Kabiraj	3 (8.8)
Mother of the infant	3 (8.8)
No treatment	8 (23.5)

* Note: Multiple answers considered

Table 4

Distribution of maternal factors related to Infant deaths

Maternal factors	N=34(%)
Age in years	
<20	10 (29.4)
20-30	17 (50.0)
31+	7 (20.6)
Maternal age at first conception	
<20	31 (91.2)
20-30	3 (8.8)
Maternal education	
No education	24 (70.6)
Primary	10 (29.4)
Parity	
Primi	10 (29.4)
Multi	24 (70.5)
Maternal weight (kg)	
<45	19 (55.9)
45-50	11 (32.3)
51-60	2 (5.9)
not recorded	2 (5.9)
Maternal height (cm)	
<140	5 (14.7)
>140	29 (85.3)

Table 5**Distribution of the death cases by main occupation of the household head**

Occupations	Death cases (%) N=34
Day labour	16 (47.0)
Agriculture	9 (26.5)
Self employment	4 (11.8)
Business	3 (8.8)
Service	2 (5.9)

Table 6**Socioeconomic and household factors related to infant deaths**

Socioeconomic factors	(%)
Household status	
TG	27 (79.4)
NTG	7 (20.6)
Husband's education	
No education	22 (64.7)
Primary	10 (29.4)
Not stated	2 (5.9)
Number of living rooms	
1	20 (58.8)
2	11 (32.4)
3	2 (5.9)
4	1 (2.9)
Household members	
2	1
3-5	23
5+	10
Sanitary latrine	
Yes	4 (11.8)
No	30 (88.2)

Table 7
Type of Initial food given to the Infants

Type of food	%(N=28)
Honey	19 (55.9)
Animal milk	6 (17.6)
Sugared water	4 (11.8)
Colostrum	4 (11.8)
Breast milk	1 (2.9)

Table 8
Reasons for giving additional foods to the infants in first week of life

Reasons	(%) N=34
Insufficient breast milk	24 (85.7)
Baby could not suck	2 (7.1)
Sickness of mother	2 (7.1)

জন্মওজন কম হওয়াই শিশুমৃত্যুর প্রধান কারণঃ বাংলাদেশের

গ্রামাঞ্চলে একটি সমীক্ষা

রুখসানা গাজী, ফজলুল করিম ও আহমেদ আলী

ভূমিকা

একটি জনগোষ্ঠীর স্বাস্থ্য ব্যবস্থা এবং জীবন যাত্রারমান কতখানি উন্নত তা অনুধাবনের একটি উপায় হলো ঐ এলাকার শিশু মৃত্যুর হার যাচাই। গবেষণায় দেখা গেছে যে, যেখানে শিশু মৃত্যুর হার কম সেখানে জন্মহারও কম। পৃথিবীর যে সমস্ত উন্নয়নশীল দেশে শিশু মৃত্যুর হার অত্যন্ত বেশি, বাংলাদেশ তাদের মধ্যে অন্যতম। অপরদিকে প্রতি বছর বাংলাদেশে যে সমস্ত শিশু জন্মগ্রহণ করে তাদের অর্ধেকই কম জন্মওজন নিয়ে জন্মায়। গ্রামাঞ্চলে শিশু মৃত্যুর সাথে কম জন্মওজন কিভাবে এবং কতটা সম্পর্কযুক্ত সে সম্বন্ধে আমাদের খুব একটা জানা নেই। বাংলাদেশের মানিকগঞ্জ জেলার গ্রামে ১৯৭৬ সাল থেকে ত্র্যাক সমন্বিত কর্মসূচির মাধ্যমে সেখানকার দরিদ্র জনগোষ্ঠীর জীবন যাত্রারমান উন্নয়নের জন্য কাজ করে আসছে যার একটি অন্যতম উদ্দেশ্য হচ্ছে ঐ এলাকার মানুষের স্বাস্থ্য উন্নয়ন। তাই, ঐ এলাকায় ত্র্যাকের কর্মকাণ্ড শিশু মৃত্যু হার হ্রাসের ক্ষেত্রে কোনো সুফল এনেছে কিনা তা দেখার উদ্দেশ্যে গবেষণাটি করা হয়েছে।

গবেষণার উদ্দেশ্য

মানিকগঞ্জ জেলার ত্র্যাকের কর্ম এলাকায় শিশু মৃত্যুর হার ও তার কারণ এবং শিশু মৃত্যুর সাথে সম্পর্কিত বিষয়গুলো খুঁজে বের করা।

গবেষণা এলাকা ও সময়কাল

এই গবেষণাটি মানিকগঞ্জের তিনটি ইউনিয়নে করা হয়েছে। গবেষণার সময়কাল ছিল ১৯৯৩-১৯৯৪।

গবেষণার পটভূমি ও পদ্ধতি

এটি একটি ভবিষ্যাপেক্ষ (Prospective) গবেষণা ছিল, অর্থাৎ এখানে শিশুর জন্ম থেকে শুরু করে বয়স এক বছর হওয়া পর্যন্ত তাকে পর্যবেক্ষণ করা হয়েছে। গবেষণায় গর্ভবতী মায়েরদেরকে চিহ্নিত করা হয়েছে তাদের গর্ভকালীন সময়ের শেষ ভাগে (শেষ তিন মাসের মধ্যে)। প্রতি গর্ভবতী মায়ের বাড়ির একজন

উপসংহার ও সুপারিশমালা

- শিশুর অকাল মৃত্যুর জন্য দায়ী প্রধান অসুখগুলি যেমন, শ্বাসনালীর সংক্রমণ ও ডায়রিয়া সংক্রান্ত জটিলতা সম্পর্কিত লক্ষণগুলো পরিবারের সকল সদস্যকে জানাতে হবে। যাতে অসুস্থতা তাড়াতাড়ি চিহ্নিত হয় এবং জটিল আকার ধারণ করার আগেই চিকিৎসা করা সম্ভব হয়।
- গ্রামাঞ্চলে সুলভ ও সহজলভ্য চিকিৎসা ব্যবস্থা নিশ্চিত করতে হবে।
- কম-ওজনের শিশুর জন্য প্রতিরোধ করার জন্য গর্ভবতী মায়েদেরকে পুষ্টির খাদ্য গ্রহণে উৎসাহিত করতে হবে এবং সমাজভুক্ত সকলকে এ ব্যাপারে সচেতন করে তুলতে হবে।
- শিশুর বয়স চার মাস পর্যন্ত শুধুমাত্র বুকের দুধ খাওয়ানোর জন্য মায়েদেরকে উৎসাহিত করতে হবে এবং শিশুদের কলোষ্ট্রাম খাওয়ানোর উপর জোর দিতে হবে।

প্রাপ্তবয়স্ক ব্যক্তি নির্ধারণ করা হয়েছিল যিনি শিশু জন্মানোর সাথে সাথে ব্র্যাকের অফিসে সংবাদ প্রদান করবেন। শিশু জন্ম গ্রহণ করার ৪৮ ঘণ্টার মধ্যে শিশুর জন্মওজন নেওয়া হয় এবং শিশুর বয়স এক বছর হওয়া পর্যন্ত প্রতিমাসে একবার করে ফলোআপ ভিজিট দেওয়া হয়। প্রতিটি ফলোআপ ভিজিটের সময় শিশুর খাদ্যাভ্যাস, অসুস্থতা এবং পুষ্টি ও বৃদ্ধি সম্পর্কে নির্ধারিত ফর্মের মাধ্যমে তথ্য সংগ্রহ করা হয়। শিশুর এক বছর বয়সের মধ্যে তার যদি মৃত্যু ঘটে তবে আলাদা ফর্মে শিশু মৃত্যু সম্পর্কিত তথ্য রেকর্ড করা হয়।

ফলাফল

গবেষণা অন্তর্ভুক্ত মোট ৬৪৪ জন শিশুর মধ্যে ৩৪ জন তাদের বয়স এক বছর পূর্ণ হওয়ার আগেই মারা যায়। ঐ অঞ্চলের শিশু মৃত্যুর হার প্রতি ১০০০ জীবিত জন্ম শিশুর মধ্যে ৫৩ জন। এই হার বাংলাদেশের শিশু মৃত্যুর হারের (প্রতি ১০০০ জীবিত জন্ম শিশুর মধ্যে ৭৭ জন) চেয়ে কম ছিল। জন্মের পর থেকে ১ বছরের মধ্যে মারা মারা গেছে তাদের মধ্যে শতকরা ৭৩ ভাগই ছিল কম জন্মওজনের শিশু। আবার জন্মের পর এক মাসের মধ্যেই মারা যায় ৪৮% শিশু, যাদের বেশিরভাগই জন্ম গ্রহণ করেছিল কম ওজন নিয়ে। কম ওজনের শিশু এবং স্বাভাবিক শিশু এই দুই গ্রুপেরই শিশুদের মধ্যে সবচেয়ে বেশি মারা গেছে, যে দু'টি প্রধান অসুখে তা হলো ডায়রিয়া এবং শ্বাসনালীর সংক্রমণজনিত জটিলতায়। শতকরা ২৩ ভাগ ক্ষেত্রেই শিশুরা (মৃত্যুর সাথে জড়িত) অসুস্থতার জন্য কোনো চিকিৎসাই পায়নি। আবার যারা চিকিৎসা পেয়েছে তাদের মধ্যে অধিকাংশের চিকিৎসাদাতা ছিল নিজেদের আত্মীয়স্বজন। গবেষণায় আরো প্রতীয়মান হয়েছে যে, দরিদ্র আর্থ-সামাজিক অবস্থা, পিতা-মাতার নিরক্ষরতা, বাসস্থানে স্যানিট্যারী ল্যাট্রিনের অভাব, বৃহৎ পরিবার এবং অধিক সন্তানের জন্মদান শিশু মৃত্যুর সাথে সম্পর্কিত হতে পারে। যে সব শিশু মারা গেছে তাদের মধ্যে ক্ষতিকর খাদ্যাভ্যাসগুলো পাওয়া গেছে যেমন, শিশুকে বুকের দুধ খাওয়ানো শুরু করার আগে অন্য খাবার দেয়া, শিশুকে কলোস্ট্রাম না দেয়া, শিশুর বয়স চার মাস হওয়ার আগেই বুকের দুধের পাশাপাশি অন্যান্য খাবার দেয়া ইত্যাদি।