

ACUTE LOWER RESPIRATORY INFECTIONS IN RURAL BANGLADESHI CHILDREN: PATTERNS OF TREATMENT AND IDENTIFICATION OF BARRIERS

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Abstract. A study conducted in rural Bangladesh examined the patterns of health seeking behavior, mothers' recognition of symptoms, the perceived causes and barriers to timely treatment of acute lower respiratory infections (ALRI). A total of 194 children under 5 years of age suffering from ALRI in an intensive maternal child health and family planning area was prospectively followed. About 62% of the mothers sought allopathic treatment for their children within 24 hours of case detection. No treatment of any kind was sought in 45 (23.2%) cases. Most of the mothers could recognize the different symptoms of ALRI. Cold was reported as the most common cause of ALRI. No significant difference was observed in the reported symptoms or perceived cause of the disease between those who sought no treatment and those who sought allopathic, homeopathic, spiritual or combined treatments. Failure to recognize severity followed by work loss were the most common reasons identified for not seeking any medical care. Whether or not a mother sought allopathic treatment was not associated with the child's age, sex, mother's age, mother's education, duration of illness, birth order, housing type or distance from the health center. The study indicates the potential value of giving parents clear guidelines on recognition of severity of symptoms of ALRI and motivating them to seek treatment quickly when these symptoms present. Health service providers should be aware of the heavy work loads which rural women have and the severe time constraints which deter them from seeking timely treatment from the appropriate sources.

INTRODUCTION

Acute respiratory infections (ARI) are the major cause of morbidity and mortality in young children in the developing world (Denny and Loda, 1986). They account for nearly one third of all deaths among under five children in many countries including Bangladesh (Stransfield, 1987; Spika *et al*, 1989), mostly from acute lower respiratory infections (ALRI). Prompt and appropriate treatment is essential in severe ALRI if the child's life is to be spared. Studies have demonstrated that childhood mortality due to ALRI could be reduced by half through early detection and treatment of the cases (Sazawal and Black, 1992). A study in Indonesia found that infants with ARI were more likely to be taken to an indigenous healer and that this reduced the chances of getting effective medical care in time (Kresno *et al*, 1994).

Private health practitioners are utilized heavily

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in rural Bangladesh because of their availability, accessibility and social perceptions of illness causation (Sarder and Chen, 1981). Although most of them have no formal qualification still they are widely respected. There are three main categories of healers and they can be distinguished by the types of medicine they use. The first group uses mainly allopathic drugs such as antibiotics which are freely available in Bangladesh and widely abused (Hossain *et al*, 1982), the second homeopathic, and the third herbal and spiritual treatments.

Studies in Bangladesh suggest that most mothers can recognize the symptoms of ARI after proper training (Stewart *et al*, 1994), and they preferred home treatment for ARI by rubbing the patient's chest and body with mustard oil and avoidance of cold (Parker, 1990). To develop effective home care advice, referral, and other recommendations for appropriate communication with parents of young children, an understanding of the cultural behaviors is required. This study was designed to determine the patterns of treatment among children less than 5 years of age suffering with ALRI, reported symptoms by mothers, perceived causes and

to identify major modifiable barriers to its timely treatment in rural Bangladesh where an intensive Maternal Child Health and Family Planning (MCH-FP) program has been in operation for more than a decade (Fauveau *et al*, 1990).

MATERIALS AND METHODS

The study was conducted in Matlab, a rural area located 45 km south east of Dhaka, the capital of Bangladesh. Matlab is a low lying flood prone area intersected by numerous canals and rivers. Subsistence farming, fishing and wage labor are the main occupations. The population density of this area is about 700 per km² and the infant mortality rate is about 80 per 1,000 live births (ICDDR, B, 1993). Since 1963, the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) has been maintaining a field research station at Matlab. A demographic surveillance system (DSS) which consists of regular cross sectional censuses and longitudinal registration of vital events has been maintained in the area since 1966 (ICDDR, B, 1978). The current population under DSS is about 205,000. A MCH-FP program has been in operation for half of the population of the DSS area since 1978. For practical reasons the MCH-FP area is divided into four operational blocks (A, B, C, and D) and one female community health worker (CHW) based in her village covers a population of about 1,200. She makes fortnightly home visits to each household to provide MCH-FP services and collect data (Fauveau *et al*, 1990). The present study was conducted in all 17 villages in one of the blocks (B) of the MCH-FP area. This block is located neither too close nor too far from the Matlab hospital.

The ARI control program was initiated in the MCH-FP area in 1988 with the aim of decreasing morbidity and mortality due to ARI among under five children (Fauveau *et al*, 1992). Only children with moderate or severe ARI were included in this prospective cohort study. The current WHO criteria for rapid breathing of having a respiratory rate greater than 50 breaths per minute (for children between the ages 2 and 12 months) or 40 breaths per minute (for children 12 months or older) was used (WHO, 1990). ARI was considered to be moderate when the child was suffering with cough and rapid breathing with no accompanying chest indrawing or other signs of severe ARI. ARI was considered

to be severe if, in addition to rapid breathing, chest indrawing or other signs of severe ARI, such as the inability to drink, were present (Sutrisna *et al*, 1991). Children less than two months of age who manifested fast breathing (60 or more breaths per minute) or chest indrawing were considered to be severe case of ARI. For the study purpose moderate and severe ARI cases were grouped together as ALRI. CHWs were trained to detect and differentiate cases of ALRI through the assessment of respiratory rate and presence or absence of chest indrawing. They were advised to give home treatment (tablet co-trimoxazole) in moderate cases of ARI and to refer severe cases to Matlab Hospital. Between February 1993 and July 1994 a total of 194 cases was included in this study.

The cases were identified in three ways; a) through routine fortnightly surveillance by the CHWs (n = 78), b) reported by local village practitioners (n = 24), and c) on completion of the scheduled interview with the mothers of the reported case the interviewers searched for any unreported ARI cases (n = 92) in the same neighborhood. Four messengers were selected for the study who contacted the CHWs and local village practitioners daily for information regarding new cases. The interviewers were informed about the cases at Matlab by the messengers each evening. On the next day the interviewers from Matlab visited the cases and included them in the study if they fulfilled the criteria for inclusion (below five years of age, moderate or severe cases of ARI) and mothers agreed to participate. Children who experienced multiple episodes of ALRI during the study period were included once in the data collection. Once a child was included in the study other children from the same family were not included. The interviewers had at least 12 years of education and were given 15 days of training at Matlab Hospital to record accurately a child's respiratory rate and to recognize chest indrawing. Once cases were confirmed, structured and open ended questionnaires were administered to mothers by the interviewer. These included detailed data on socio-demographic variables, perceptions of child's symptoms, perceived cause of the disease and health seeking behavior, if any. Choice of provider and, in those cases where no treatment was sought, reasons for not seeking treatment were also explored. Further, 11 of the local practitioners mentioned by respondents most frequently were interviewed in depth and several other knowledgeable key informants were identi-

fied and interviewed. In addition to interviewing practitioners we were able to observe their interactions with patients and consulted them on hypothetical cases to investigate their treatment practices.

Chi-square tests were used to compare data between the groups. Bivariate and logistic regression analyses were done to find any possible association between age of the child, child's sex, mother's age, mother's education, duration of illness, birth order, housing type, distance from the Matlab hospital and treatment seeking type.

RESULTS

Socio demographic characteristics

A total of 194 children with ALRI was detected and included in the study. Male children comprised of 61.3% of the cases. The majority (57.7%) of the cases were below one year of age. One third of the mothers was below 25 years of age and 35.1% were 30 years and above. About 58% of the mothers had no formal education and about 27% completed 5 years or more schooling (Table 1).

Patterns of treatment seeking

Table 2 shows that allopathic treatment was most commonly used. Allopathic treatment alone was sought by 82 (42.3%) mothers, with CHWs treating 74% of these cases, whereas 45 (23.2%) mothers sought no treatment for their children. Combinations of treatment were taken by 41 (21.1%) cases. As reported by mothers the mean (\pm standard deviation, SD) duration of illness prior to interview was 3.3 ± 1.8 days in allopathic treatment group, 4.8 ± 4.1 days in the homeopathic treatment group and 2.8 ± 1.6 days in the no treatment group.

Duration of illness and treatment seeking

Mothers seeking allopathic treatment tended to do so earlier than those seeking homeopathic treatment but this difference was not significant (Fig 1). Within three days of the onset of illness 70.7% of the cases in the allopathic group sought treatment

compared to 59.1% in the homeopathic group ($p = 0.29$).

Table 1

Socio-demographic characteristics of the cases (n=194).

	N (%)
Sex	
Male	119 (61.3)
Female	75 (38.7)
Child's age (month)	
0-5	69 (35.6)
6-11	43 (22.2)
12-17	23 (11.9)
18-23	25 (12.9)
24+	34 (17.5)
Mothers age (year)	
15-19	10 (5.2)
20-24	54 (27.8)
25-29	62 (32.0)
30+	68 (35.1)
Mother's education (years of schooling)	
0	112 (57.7)
1-4	30 (15.5)
5+	52 (26.8)
Birth order	
1	44 (22.7)
2	55 (28.4)
3	27 (13.9)
4	68 (35.1)
Housing type	
Tin X tin/brick	17 (8.8)
Tin X jute stick/bamboo	131 (67.5)
Others*	46 (23.7)
Distance to Matlab Health center (meter)	
< 4,000	68 (35.1)
4,000-5,999	93 (47.9)
6,000+	33 (17.0)

* Others include housing with straw, bamboo and jute stick.

Table 2

Patterns of care among children with acute lower respiratory infections in rural Bangladesh.

	N (%)
Allopathy only	- 82 (42.3)
Allopathy + Homeopathy	- 27 (13.9)
Allopathy + Homeopathy + Traditional healer	- 6 (3.1)
Allopathy + Traditional healer	- 6 (3.1)
Hemopathy only	- 22 (11.3)
Homeopathy + Traditional healer	2 (1.0)
Traditional healer only	- 4 (2.1)
No care sought	- 45 (23.2)
Total	- 194 (100)

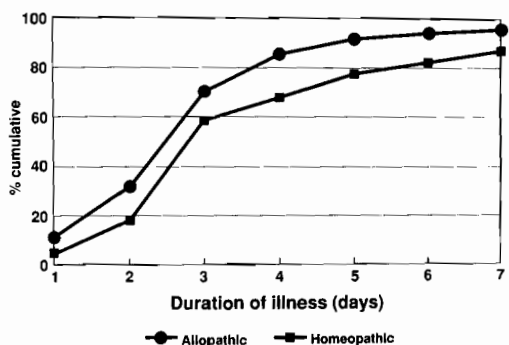


Fig 1—Allopathic and homeopathic treatment seeking behaviors of mothers by duration of illness of the study children.

Symptoms

The symptoms reported by mothers are presented in Table 3. More than 95% of mothers in all the treatment groups reported the symptoms of cold and fever. Cough was the next most commonly reported symptom followed by rapid breathing. There was no statistically significant difference in reported symptoms either mentioned first or at any other time between the treatment groups ($p > 0.05$).

The perceived causes of ARI

Most mothers (75-92%) reported that cold was

the main cause of the disease (Table 4). In 25-55% of the cases the cold was said to have been aggravated or caused by some behavior or neglect of the mother. These behaviors included washing herself in cold water, drinking or eating cooling foods or going barefoot, all of which were said to have cooled the breast milk and thus caused the baby to be ill. Sometimes mothers blamed themselves for not keeping the child well wrapped or having allowed the child to eat or drink foods regarded as cooling. Accidents during delivery or pregnancy and spiritual forces were also identified as causing the disease in a few cases (Table 4). There was no significant difference in the reported causes of the illness between the treatment groups ($p > 0.05$).

The treatment providers

Many parents sought allopathic treatment from unqualified village practitioners. We found that for respiratory disorders they often prescribed small doses and combined more than one antibiotic with an anti-histamine and/or analgesics for one or two days. For those who could afford it they administered injections which were generally regarded as a powerful form of treatment.

The second group of practitioners primarily used homeopathic medicines which were cheaper than allopathic drugs. Practitioners and many parents expressed the belief that homeopathic medicine was particularly suitable for young children as it was thought to be milder and less "heating" than antibiotics which may give side effects. Nevertheless, it was also repeatedly reported that homeopathic medicines work more slowly than allopathic drugs.

The last group were spiritual healers who are known as kobiraj and use a range of spiritual and herbal treatments. These treatments are resorted to when there is thought that there may be a spiritual cause of the illness which may be indicated by symptoms such as febrile convulsions or when other treatments are ineffective. Many practitioners combine different types of treatment and at least one of the practitioners we interviewed used all three methods. They have generally learned their practice from a relative and some claim to have had a spiritual initiation through a dream.

Table 3

Symptoms reported by mothers of children suffering with acute lower respiratory infections in rural Bangladesh by type of care.

Treatment group	Rapid breathing	Breathing difficulty	Cold + fever	Indrawing chest	Cough	Chest noise	Feeding refusal	Running nose	Others*
Allopathy only (n = 82)	72.0 (2.4)	50.0 (3.7)	97.6 (57.3)	54.9 (0)	80.5 (13.4)	48.8 (1.2)	46.3 (2.4)	37.8 (13.4)	42.7
Homeopathy only (n = 22)	72.7 (0)	54.5 (0)	95.4 (68.1)	50.0 (0)	95.4 (18.1)	54.5 (0)	59.0 (0)	18.1 (13.6)	31.8
Traditional healer only (n = 4)	50 (0)	75 (0)	100 (75)	50 (0)	100 (0)	75 (0)	75 (0)	25 (0)	50.0
Combined (n = 41)	68.3 (2.4)	51.2 (2.4)	95.1 (63.4)	63.4 (2.4)	73.2 (14.6)	58.5 (2.4)	51.2 (2.4)	19.5 (4.9)	46.3
No treatment (n = 45)	73.3 (4.4)	68.9 (0)	97.8 (64.4)	42.2 (0)	86.7 (11.1)	68.9 (0)	48.9 (4.4)	22.2 (6.7)	42.2

Data expressed as percentages of mothers in the specific treatment group

() reported symptoms mentioned first.

* Others include - Excessive crying, lethargy, vomiting, redness of eyes, excessive sweating, restlessness, etc.

No significant difference between any treatment groups.

Table 4

Perceived cause of the disease reported by mothers of children with acute lower respiratory infections in rural Bangladesh.

Treatment group (n)	Cold	Spiritual	Mothers behavior	Pregnancy	Delivery	Accident	Others*
Allopathy only (82)	91.5	3.7	45.1	1.2	0	4.9	15.9
Homeopathy only (22)	86.4	0	54.5	0	0	4.5	9.0
Combined treatment (41)	80.5	7.3	51.2	4.9	0	4.9	24.4
Traditional healer only (41)	75.0	0	25.0	0	0	0	0
No treatment (45)	88.9	0	53.3	4.4	2.2	2.2	20.0

Data expressed as percentages of mothers in the specific treatment group.

* Others include excess heat, diarrhea, dysentery, excessive sweating etc.

No significant difference between any treatment groups.

Why treatment was not sought

A common reason for not seeking treatment was failure to recognize the severity of symptoms (46.7%) followed by work loss (31.1%). About one quarter of mothers reported distance/transport difficulties as the reasons for not seeking any treatment (Table 5).

Using bivariate and logistic regression analysis the child's age, mother's age, mother's education, birth order, duration of illness, housing type or distance to Matlab hospital were not found to be associated with the allopathic treatment seeking behavior (Data not shown).

Table 5

Reasons for not seeking any medical care by the mothers of children suffering with acute lower respiratory infections in rural Bangladesh (n = 45).

Reasons	N	(%)
Distance/transport difficulties	11	(24.4)
Purdah*	1	(2.2)
Permission	5	(11.1)
Workloss	14	(31.1)
Past bad experience	4	(8.9)
Mothers sickness	2	(4.4)
Economic reasons	12	(26.7)
Failure to recognize severity	21	(46.7)

* A religious concept which restrict contact with unrelated male persons.

DISCUSSION

The study clearly indicates that allopathic treatment was most commonly sought in the study population. Similar findings have been reported previously from Bangladesh (Feldman, 1983). Mothers received allopathic treatment from the CHWs, local village practitioners and in cases where they were referred to Matlab Hospital. In this area as elsewhere in Bangladesh there is considerable choice of treatment options since indigenous and traditional healers constitute more than 80% of the vil-

lage practitioners (Sarder and Chen, 1981). Furthermore, there was considerable overlap of practices with individual parents trying different kinds of treatment either simultaneously or consecutively. Individual practitioners in the area were often found to use combinations of different kinds of allopathic, homeopathic, herbal or spiritual treatments depending on their own diagnosis and the parental demand or preference. Each of these respective types of treatment is regarded by practitioners and patients as having merits as well as limitations. Belief in one system need not preclude faith in other types of treatment.

Among mothers who sought only allopathic treatment 26% taken from non-trained private village practitioners. About one quarter of mothers did not seek any medical care even in this intensive MCH-FP area where CHWs visit every fortnightly and provide maternal and child health care services at the door step. All mothers had supposedly received information about treatment of ARI of their children in this area. A large survey in Indonesia (Chernichovsky and Meesook, 1986) suggested that household income and availability (distance) were important determinants of health seeking behavior. In Matlab we found that despite the fact that the appropriate services are free of charge families incur expenses for transport, time and subsistence if their children are referred to treatment centers at some distance from their home and this deters some parents from seeking appropriate treatment.

The study found that with training most mothers could recognize the critical symptoms of ALRI although they did not all appreciate the severity or seek timely treatment. In depth interviews and observations of 11 of the more popular local private practitioners revealed that they were unable to recognize the symptoms of ALRI, did not examine their patients physically and could not diagnose ALRI. This suggests that these local private practitioners also need training in recognition and treatment of ALRI as well as guidelines on referral. As they are a popular source of treatment such training might benefit the community by increasing the numbers offered correct treatment and reducing the inappropriate use of antibiotics.

We did not find any association between the mother's age, education and care seeking behavior. When examined care seeking behavior for fatal illnesses among children Sutrisna *et al* (1993) re-

ported similar findings from Indonesia. However, several things should be noted before interpreting the results of our study. Firstly, we included only one ALRI episode per child and per family. We do not know how mothers treatment choices were made in cases of recurrent ALRI infections. Secondly, the study villages were in one of the blocks in the MCH-FP area where an intensive intervention has been in place for more than fifteen years and where there is a higher contraceptive prevalence than in the rest of Bangladesh. Like other parts of Bangladesh, however, it has communication difficulties both in the rainy and dry seasons. Thirdly, some mothers delayed and sought treatment for their children following our interview although they could recognize most of the symptoms of ALRI (Stewart *et al*, 1994). Fourthly, CHW detected the cases only through routine fortnightly visits to each household. So, cases of ALRI between their routine visits were not reported.

Most respondents cited exposure to cold as a cause of ALRI similar to those reported from Ghana (Denno *et al*, 1994). Maternal beliefs about the cause of ARI have been shown to influence health seeking behavior in other studies (Gove and Pelto, 1994). But in our study there was no significant difference between the beliefs about disease causation held by mothers who sought only allopathic, homeopathic and those who sought no care or a combination of treatments.

One third of the respondents reported work loss as the barrier that deterred them from seeking treatment and mentioned essential subsistence tasks such as the post harvest processing of crops, caring for livestock or poultry and cooking and caring for other members of the family. Treatment from CHWs and the hospital are free of charge. The present study revealed that even though most mothers could recognize the critical symptoms of ALRI, but failed to recognize severity and all did not seek timely treatment. Few mothers recognized these signs to be simple cough and cold and did not interpret them as serious. Some mothers also believed that free treatment from CHWs may not be effective while few others preferred syrup form of medicine than tablet form. Health education messages to mothers, CHWs and local village practitioners should be focussed on the importance of timely treatment of ALRI, encouraging them to seek early appropriate treatment to reduce morbidity and mortality. The mothers in our study popu-

lation did not make decisions alone and some were deterred from treatment seeking by their older relatives especially when their husbands were absent. This suggests that other community members including fathers and older people should also be informed and motivated to seek prompt treatment for children with ALRI.

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