

Use of Drugs and Treatment Cost in Acute Watery Diarrhoea of Under-2 Children Attending a Tertiary Hospital of Bogra

AKM MURADUZZAMAN¹, S M RASHED-UL ISLAM², MD. MAHMUDUR RAHMAN SIDDIQUI³

Abstract

A cross-sectional study was conducted in Mohammad Ali hospital (MAH) of Bogra from Bangladesh to evaluate the hand washing and exclusive breast feeding (EBF) practice and to explore the rational use of anti-diarrhoeal therapy in Acute Watery Diarrhea (AWD) and expenditure of the family in treatment. A total of 660 under-2 children attending at MAH with the complaints of AWD were selected for the study. The mean age (mean±SD) of the attended child was 11.75±5.16 months. About 80% of the respondents (mothers of under-2 child) were below SSC level in terms of educational status while about 9% were illiterate. About 85% of the respondent seek treatment from non-registered practitioners (NRP) while registered doctors contributed only among 12% which was found statistically significant in comparison to their family income ($p < 0.001$). Azythromycin was the most prescribed drugs (22.4%) followed by ciprofloxacin (21.7%) and erythromycin (15.9%) which was mostly prescribed by non-registered doctors ($p < 0.05$). The families had to spend a mean cost of Tk. 209/- which was spend significantly high on NRP ($p < 0.05$) as a direct treatment cost. Misuse of antibiotics was observed from NRP and a handsome amount was spending on them. Moreover, About 91% of the total respondent did not practice exclusive breast feeding and about 99% mother found to admit improper hand hygiene. To reduce unnecessary expenditure and ensure proper treatment of AWD, it was recommended to aware the community on quality management at government facility.

Key words: Acute watery diarrhea, Exclusive breast feeding, Hand hygiene, Treatment cost.

Introduction:

Diarrhoeal disease is the second leading cause of Under-5 children which accounts near about 2 million deaths yearly.¹ The majority of this death can be prevented by timely initiation of oral rehydration solution (ORS) and healthy feeding practice. But less than one-third of children failed to receive ORS or appropriate feeding practice in South-Asia and sub-Saharan Africa.² In Bangladesh, ARI is the main causes of death following Diarrhoea. Dehydration from diarrhea is an important contributing factor in childhood mortality which can be easily prevented by simple means like use of ORS. Report from BDHS (2011) showed that, about 5% of children had diarrhea at two weeks before the survey.³

As per WHO (2005), anti-microbial should not be used unless the child is suffering from bloody diarrhoea, cholera or any other laboratory proven infective diarrhea with systemic infection.⁴ Many ineffective and potentially toxic drugs are

widely prescribed and in many countries, as it is easily obtained without prescription.⁵

Bangladesh is much more vulnerable situation combating under five childhood mortality from AWD. A very limited study has been carried out to evaluate the prescribing pattern in AWD and care seeking pattern of suffers. Therefore, this study was an attempt to explore the fact regarding the treatment pattern of AWD among the under 2 children and their money spending amount were also an issues of concern.

Materials and methods:

The cross-sectional study was conducted among 2087 mothers of under 2 child presented with AWD during the period of January through March, 2009 at MAH. Among them, 660 mothers of under 2 child was consecutively selected using accidental sampling technique and child with laboratory tested stool negative for blood or pus cell (direct microscopy), infectious diarrhea or shigellosis and all the children under 1 month of age (Infant) were excluded. Information was collected from mothers by face to face interviews using an interviewer-administered semi-structured pre-tested questionnaire. Informed consent was taken from all the respondents after explaining the objectives of the study and ethical issues were addressed according to ethical review committee of State University of Bangladesh (SUB). Information was dealt with confidentiality and was used for

1. OSD, Department of Virology, BSMMU, Bangladesh.
2. Medical Officer, Department of Virology, BSMMU, Bangladesh.
3. Assistant Professor, Department of Medicine, AKMMC, Bangladesh.

Correspondence: Dr. AKM Muraduzzaman, MBBS, MPH, OSD, Department of Virology, BSMMU, Bangladesh. E-mail: muradbogra_dr@yahoo.com

this study only and respondents enjoyed full freedom to withdraw their consent at any time and at any stage of this study. Data was analyzed by using SPSS soft-ware (Version 17.0). Descriptive statistics like frequency distribution, percentage, mean±SD, chi-square test was performed. All ‘p’ value <0.05 was considered as significant.

Results:

Demographic and Socio-economic characteristics:

In this study, 660 mothers of under 2 child suffering from AWD were interviewed. The mean age (mean±SD) of the child was 11.75±5.16 years. Among which 17.1% (n=113) children were at 12 months of age and about 51.4% respondents were belong to the 7-12 months age group (Figure-1).

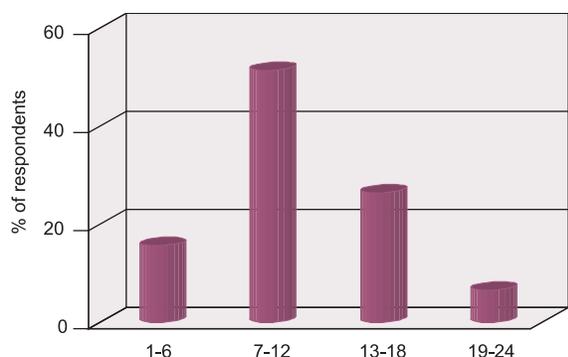


Fig.-1: Age distribution among the children suffering from AWD (n=660)

Most of the mother (n= 283,42.9%) has passed primary level education and 9.1% (n=60) found to be illiterate. On

distribution of respondents as per family income, 50.8% (n=335) belong to Tk. 3001-5000/- income group and 16.7% and 32.5 % were from the earning below Tk. 3000/- and above Tk. 5001/- respectively. The mean income of the all respondents were Tk. 4841/-. On consideration of care seeking pattern from the respondents during the acute phase of AWD, 87.27% (n= 576) visited to NRP, whereas only 12.72% (n=84) visited to registered doctors. Comparing with the family income <Tk. 5000/-, 84.94% (n=378) respondents visited to NRD (p<0.001). On the other hand, only 15.06% (n=67) seeks care from registered doctors (Table-1).

48% of mother went to Rural Medical practitioners (RMP) followed by drug seller (Pharmacist) which contributed 27.7%. Among the mothers whose background were below SSC (n=596,), 90.79% (n=523) mothers seek treatment from NRP (p<0.001) (Table-1). Among the all children, 91.5% (n=604) child were given Oral rehydration salt (ORS) solution.

Use of antibiotics in treatment of AWD:

The most frequently used antibiotics were Azythromycin (21.1%) followed by ciprofloxacin (20.2%) and erythromycin (15.2%) (Table-2). Among the antibiotics receivers, 99.2% (n=496) were prescribed by non-registered doctor which was significantly high (p<0.001) than prescribed by registered doctors (Table-1). For the treatment of diarrhea, in addition of antibiotics, secondary agents like Nitazoxanide (40.2%, n=265), followed by metronidazole (22.7%, n=150) were also found to be prescribed (Data not shown).

Table-I

Care seeking patterns, family income (in taka), educational background, antibiotics prescribers and money spending tendency on care givers

Features (n=660)	*NRP	Registered doctors	Total	
Care seeking patterns	*Income<5000 tk.	378	67	445
	Income>5000 tk.	198	17	215
Educational background	*Below SSC	523	73	596
	Above SSC	53	11	64
Antibiotics prescribers	No antibiotics	76	81	157
	*Antibiotics	496	4	503
Money spending (In taka)	Up to 300	442	81	523
	*>300	134	3	137

*p<0.001, Chi-square test done.

Table-II
Use of antibiotics in treatment of AWD (n=660)

Antibiotics	Frequency (n=660)	Percentages (%)
No drugs given	154	23.3
Azythromycin	139	21.1
Co-trimoxazole	35	5.3
Roxythromycin	20	3.0
Ceftriaxone	14	2.1
Ciprofloxacin	133	20.2
Erythromycin	100	15.2
Amoxycillin	22	3.3
Nalidixic acid	43	6.5

Exclusive breast feeding and Hand washing practice:

EBF practice among the mothers was also evaluated. Only 9.1% (n=60) was found to be practiced exclusive breast feeding. On consideration of education status, significantly high (p<0.001) number of mother with educational status below SSC did not practiced EBF. The present study also observed very poor hand washing practice from 99% mothers during 5 critical moments (Before preparation of food, before feeding of the baby, before eating, after defecations and after cleaning of the baby’s stool) by soap or ash.

Expenditure related factors:

The mean cost for the treatment of AWD were Tk. 209/- (Maximum Tk. 1100/-). Strong relationship was observed between care giver and money spending (>Tk.301/-) where 97.81% (n=134) family had to pay more money to Non-registered doctors (p<0.001) comparing to family (2.19%, n=3) cared by registered doctors (Table-1). Most of the family (54.8%) had to spend around Tk. 100-300/- as for direct treatment cost (Figure 2).

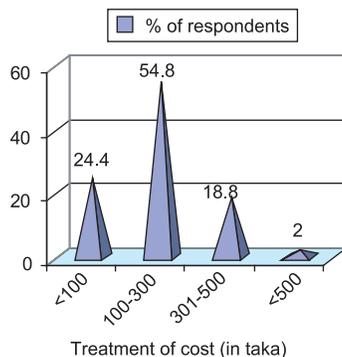


Fig.-2: *Distribution of the respondents considering treatment cost (n=660).*

Discussion:

Most of the child (Study subject) in present study (51.4%) is between the age group of 7 to 12 month which was compatible with the babies mostly suffer from AWD around this age group from other studies as well.^{6,7} Education level of the most of the mothers was found to be below SSC level (81.2%) and about 10% of the mothers were found illiterate which was the probable responsible for poor knowledge on primary diarrhoeal management and their seeking patterns. The monthly income varied among the families which influenced the care seeking pattern for treatment. Rural medical practitioners (RMP) were most prominently visited (48.2%) followed by drug seller (27.7%) which was clearly evident from the present study by their irrational/inappropriate drug prescription. Moreover, irrational antibiotics were prescribed mostly by NRP (p<0.0001) whereas rationality maintained by registered doctors. The most prescribed antibiotics in our study were macrolides group of antibiotic namely Azithromycin (21%) followed by Ciprofloxacin (20%). In an earlier study among the rural poor people of Bangladesh showed NRP like village doctor, drug seller or homeopaths were the preferred option for seeking treatment.⁸ Recent studies on use of antibiotics in sufferers of AWD in two teaching hospitals (SSMC &MH, DNMCH) showed about 52% and 75% of prescription contained use of antibiotics respectively.⁹

On the other hand, about 92% of total respondents were found to be used ORS during acute diarrhoeal episode of their children. Similar studies on use of ORS also found that, ORS was also used higher in Bangladesh than other low-income Asian countries and sub Saharan Africa.¹⁰ In Kenya, pharmacies in low socioeconomic urban and rural areas sold less oral rehydration solution (ORS) than those in middle and higher income urban areas.⁴

Treatment of AWD should not cost much as ORS and others measures are provided free of cost by Government facilities where our respondents spends significantly high (p<0.0001) on seeking treatment from NRP. Most of the respondents were not interested to seek treatment at government hospital but the reason for not seeking treatment at these facilities could not be evaluated. The present study also supported by an earlier study, where people felt comfort on utilizing private sector for acute diarrhoeal treatment.⁸ Probable reasons were the unavailability of health providers, long queue for visiting doctors, unofficial payments and uncomfortable situations might be the main concern. Similar findings were also found in other study.¹¹ In the present study, EBF and hand washing practice were also found to be very alarming. Knowledge and health education campaign

should be initiated to create mass awareness among mothers.

Easy availability of antidiarrheal drugs is an important factor in perpetuation of their misuse. Most of the antidiarrheal drugs are easily available at pharmacies. During the progress of the study, financial limitation and time constrain were considered the main study limitation and this study may not represent the total scenario as the study was done in a selected hospital.

Conclusion:

Non registered doctor's practice should be limited by legislation to prevent irrational use of drugs in AWD. Timely initiative should be taken to reduce irrational use; prevent resistant development against many fatal bacteria and financial burden of the country. In addition, community awareness program on hygiene maintenance, EBF practice and health education should be given initiated to reduce and recurrence of AWD's episodes.

Conflict of interest: We have no conflict of interest.

References:

1. Jones G, Sketetee RW, Black RE, Bhutta ZA, Morris SS. The Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet* 2003;362:65–71.
2. Victora CG, Bryce J, Fontaine O, Monasch R. Reducing deaths from diarrhea through oral rehydration therapy. *Bull World Health Organ* 2000;78:1246–55.
3. Bangladesh Demographic and Health Survey 2011. Available at: <http://www.measuredhs.com/pubs/pdf/PR15/PR15.pdf>. Accessed on March 20, 2013.
4. WHO (2005) The Treatment of Diarrhoea; manual for physicians and other senior health workers. Available at: <http://whqlibdoc.who.int/publications/2005/9241593180.pdf>. Accessed on March 27, 2013.
5. American Academy of Pediatrics. Practice parameters: the management of acute gastroenteritis in young children provisional committee on quality improvement subcommittee on acute gastroenteritis. *Pediatrics* 1996;97: 424-35.
6. Robertson SE. Patterns of healthcare use for diarrhoea at sites in six countries. *J Health Popul Nutr.* 2004 Jun;22(2):101-3.
7. Piechulek H, Al-Sabbir A, Mendoza-Aldana J. Diarrhea and ARI in rural areas of bangladesh. *Southeast Asian J Trop Med Public Health.* 2003 Jun;34(2):337-42.
8. Larson CP, Saha UR, Islam R, Roy N. Childhood diarrhoea management practices in Bangladesh: private sector dominance and continued inequities in carInt *J Epidemiol.* 2006 Dec;35(6):1430-9. Epub 2006 Sep 22.
9. Ara F, Alam MK, Momen A. Prescribing Pattern of Antimicrobials in Acute Watery Diarrhea in Children below Five Years in the Tertiary Hospitals in Dhaka City. *J. Dhaka National Med. Coll. Hos.* 2011; 17 (01): 22-24.
10. United Nations Children's Fund (UNICEF). State of the World's Children 2005: Children Under Threat. New York: UNICEF House, 2005.
11. Perry HB. Health for All in Bangladesh. Dhaka, Bangladesh: The University Press Ltd, 2000, pp. 225–27.