Impact of awareness of practice of oral rehydration therapy in treatment of diarrhoea among pediatric (<12 yrs.) patients.

M. K. Bhattacharya¹, T. Ramamurthy², K. Rajendran¹, S. Maitra¹, B. C. Seth², S. S. Kar², A. Bhattacharya²

¹National Institute of Cholera and Enteric Diseases, Kolkata, ²ID & BG Hospital, Kolkata

Abstract
In ID & BG Hospital Kolkata India through Hospital based diarrhoeal disease Surveillance System the impact on awareness of using ORT during diarrhea was assessed. The overall diarrhoeal admitted patients decreased 22.32% in 2007-08 than 1996-97, severity of dehydration decreased 14.3%, case fatality rate also decreased to 8.05 from 13.5%. Promotion of ORT thorough different awareness programme like workshops, seminars conducted by state and central govt. with the help of WHO other NGO’S, which improved the level of understanding of all people especially mothers about disease, initial management of diarrhea, dehydration status, fate of the disease, treatment of the diarrhea, regardless of age, sex, type of diarrhoeal, breast feeding and nutritional status mainly using ORT. A significant improvement is seen in diarrhoeal disease is mainly due to the impact of the awareness programme of using ORT from the onset of the diseases.

Key words Diarrhea, oral rehydration therapy, oral rehydration salt, dehydration.

INTRODUCTION
Acute watery diarrhea has been present in India since ancient times. In India diarrhoeal disease still is a major public health problem. In health institutions up to a third of total pediatric admissions are due to diarrhoeal diseases and up to 17 per cent of all deaths in indoor pediatric patient are diarrhea related (1). In household survey conducted during 1994 shows that the morbidity rates in terms of diarrhea episodes per year per child under five years is about 1.7(2).

Globally the disease accounts for 15-30 % death in children aged less than 5 years (3).

Appropriate diarrhoeal management which could be life saving in majority of cases includes ORS, other home available fluids (HAF), feeding during the episode and also use of antibiotics especially in cholera and bloody diarrhea. Proper practices of ORT during the diarrhoeal episodes prevent death from diarrhoeal disease in most of the cases. The number of children dying each year from diarrhea has decreased over the past decade from 5 million mainly because of the success of oral rehydration therapy (4). As ORT (both ORS & HAF) is a very simple technique and inexpensive live savings measures, so both state government Central Government and International bodies have been promoted its household uses.

UNICEF estimates that about 1.5 million child hood deaths still occur in the world every year that could have been prevented by increased use of ORT (5). About 10% of diarrhoeal episodes in children under 5 years of age have visible blood in the stool & these accounts for about 12% of diarrhea associated death in this age group worldwide (6). Correct use of ORT in our patient departments decreases the number of inpatients admissions for diarrhoeal diseases, a factor of significant importance in countries with limited resources (7)
Methods

The surveillance system (records) for diarrhoeal patients started in ID & BG Hospital from October 1994 & is still going on. It is a systemic surveillance system. It is usually done twice in a week. Every 5th patient admitted with acute diarrhea are enrolled in this system. The following important information usually recorded in our surveillance system:

- Time, date, month, year of admission
- Socioeconomic condition of the patient with full address.
- Duration of diarrhea before admission (from the onset of diarrhoeal)
- History of any rehydration therapy before admission (IV fluid ORS, HAF)
- Dehydration status at the time of admission,
- Any other associated clinical features.
- Treatment given before and after admission.
- Number of days of hospitalization
- Outcome of patients.

All these information are taken & rechecked by clinical staffs from the patients, parents (in case of pediatric patients) or relatives. Beside the above mentioned information some other information are usually recorded in details.

- Types & quantity of IV fluids before and after admission.
- ORS type & amount of consumption before and after admission.
- Percent of patient using ORT before admission

A questionnaire is used for recording information for all enrolled patients.

Stool sample or rectal swab is generally collected from every surveillance patient and it is immediately sent to laboratory for bacteriological, viral and parasitological analysis.

Data Analysis

The following information is tabulated for all patients, which includes age group ($\leq 12$ years $> 12$ years), male female ratio, dehydration status, percentage of patient used ORT before admission, amount of fluid taken before and after admission, out come of the patients & case fatality ratio.

Impact on the number of admission of the acute diarrhoeal patients

The proportion of acute diarrhoeal patient in our study shows admission during since 1996 till date (2008) is decreasing. Our main comparisons between the years 1996-97 & 2007-2008 shows the total number of acute diarrhoeal patient are decreased significantly.
Impact on case fatality (severity) of the disease

From the Hospital surveillance records it is clearly seen that case fatality Rate (CFR) is markedly decreased in 2007-08, than in 1996-97. It is obviously due to improved awareness of people about the diarrhea and initial management of the disease.

RESULTS

A total 53819 acute diarrhoeal patient were admitted in ID & BG Hospital during 1996 – 97. Among these 25,650 patients are admitted in 1996 & 28,169 patients admitted in 1997. In our surveillance records out of total 3021 (100) enrolled patient a total of 2075 (68.7%) pediatric patient (≤ 12 years) and 946 (31.3%) adult patients were enrolled. On the other hand during 2007-08 a total 41805 acute diarrhoeal patients were admitted in the ID & BG Hospital among these total 22123 & 19682 patient were admitted respectively in 2007 &2008. During this period (2007-2008) total 2434(100%) patients were enrolled, out of which 1678 (68.9%) were ≤ 12 years and 756 (31.1%) patients were >12 years age group.

In 1996-97 among total paediatric(<12yrs) patients 1172(56.5%) are boys and 903 (43.5%) are girls. On the other hand in 2007-08 among paediatric patients total 906 (54.0%) are boys and 772 (46.0%) are girls. Our record shows in 1996-97 before admission 681 patients (32.8%) taken ORS, 338 patients (16.3%) has taken HAF (Home available fluid), 41 patients (2.0%) taken IV fluid, 936 patient (45.1%) taken any of the above said fluid and 1039 (54.9%) has taken no fluid before admission. In 2007-08 these values are 1020 (60.8%), 700 (41.7%), 42 (2.5%) 1436 (85.6%) and 242 (14.4%) for ORS, HAF, IV fluid any fluid and no fluid respectively.

In 1996-97 a total of 1004 (48.4%) patients were admitted with severe dehydration and 822 (39.6%) with some dehydration. In 2007-08 a total of 572 (34.1%) patient admitted with severe dehydration and 1097 (65.4%) patient admitted with some dehydration.

Impact on the number of hospital admission

During 1997 – 1997 a total 53,819 diarrhoeal patients were admitted in ID & BD Hospital, out of these 25,650 patients admitted in 1996 & 28169 in 1997. In the surveillance system a total 3021 patient enrolled, among these pediatric (≤ 12 years) patients was 2075 (68.7%) In contrast, during 2007-08 a total 41805 diarrhoeal patients were admitted, out of which 22,123 and 19,682 patients admitted in 2007 & 2008 respectively. In Hospital surveillance a total 2434 patient enrolled during 2007-2008.Among these pediatric patients (<12years) was 1678 (68.9)

Table 1

<table>
<thead>
<tr>
<th>Time period</th>
<th>Total no of Hospital admitted diarrhoeal patient</th>
<th>Total no of diarrhoeal patients in surveillance</th>
<th>Total no of pediatric (&lt;12 years patient in surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-97</td>
<td>53,819</td>
<td>3021 (100%)</td>
<td>2075 (68.7%)</td>
</tr>
<tr>
<td>2007-08</td>
<td>41805</td>
<td>2434 (100%)</td>
<td>1678 (68.9%)</td>
</tr>
</tbody>
</table>
Table I shows a sharp reduction in number of total diarrhoeal admission in 2007-08 than in 1996-97 in ID & BG Hospital. Number of total enrolled patient is also decreased in 2007-08.

Impact on severity of the disease

A total 822 (39.6%) patients was admitted in 1996-97 and 1097 (65.4%) patients admitted in 2007-2008 with mild dehydration & a total 1004 (48.4%) and 572 (34.1%) patients were admitted with severe dehydration in 1996-97 and 2007-08 respectively.

Case fatality rate was (per 1000) 15.6 and 11.4 in 1996 and 1997 respectively. On the other hand it was 7.7 and 8.4 in 2007 & 2008 respectively. In 1996-97 there were total 721 recorded deaths among 53819 admitted diarrhoeal patient, whereas in 2007-08 the number of death was 336 among 41802 diarrhoeal cases. These differences were statistically significant (p <0.001).

Figure 1

Figure 1 showing Diarrhoeal case fatality rate (per 1,000) at ID Hospital

In the surveillance during 1996-97, a total 936 (45.1%) pediatric patient received any of the fluids (ORS, HAF, IV etc.) before admission to the hospital. Among those 681 (32.8%) patient received ORS, 338 (16.5%) HAF and 41 (2%) IV fluids respectively. On the other hand in 2007-2008, a total 1436 (85.6%) patient received any fluids (ORS, HAF, IV fluid) before hospital admission. Out of them 1020 (60.8%) patient received ORS, 700 (41.7%) HAF & 42 (2.5%) IV fluid respectively before admission. There is some percentage of enrolled patients having received more than one type of fluid before admission.
Table II

Total fluid received or not received among the patients

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Total no. of Patient received any fluid before admission</th>
<th>Total no. of patient did not received any type of fluid before admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-97</td>
<td>936 (45.1%)</td>
<td>1139 (54.9%)</td>
</tr>
<tr>
<td>(n=2075)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007-08</td>
<td>1436 (85.6%)</td>
<td>242 (14.4%)</td>
</tr>
<tr>
<td>(n=1678)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table III

Total ORS and HAF consumption before admission

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Total no. of Patient with % received ORS before admission</th>
<th>Total no. of patient received HAF before admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-97</td>
<td>681 (32.8%)</td>
<td>338 (16.3%)</td>
</tr>
<tr>
<td>(n=2075)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007-08</td>
<td>1020 (60.8%)</td>
<td>700 (41.7%)</td>
</tr>
<tr>
<td>(n=1678)</td>
<td></td>
<td></td>
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</table>

Table II shows, in 1996-97 (n=2075) a total 45.1% patient received any type of fluid & 54.9 % patient did not received any type of fluid before admission, in comparison during 2007-08 ( n= 1678) (85%)Patients received any type of fluids & only 14.4% patients did not received any type of fluid before admission.

On the other hand table III shows during 1996-97 (n=2075) a total 681 (32.8%) received ORS & 338 (16.3%) patients received HAF before admission with the respect of 1020 (60.8%) received ORS & 700 (41.7%) received HAF during 2007-08 (n=1678).
Table-IV shows outcome of awareness in the treatment of diarrhea by using ORT.

**DISCUSSION**

From the above mentioned results, it is very clear that a significant number of diarrhoeal patients (22.32%) decrease in ID & BG hospital in 2007-08 in comparison with 1996-97. From the surveillance records, it is easily calculated the percentage of diarrhoeal patient having used any type of fluid before admission is 45.1% in 1996-97 & 85.4% in 2007-08. There is a gross increase in number (40.3%) of patient used fluids before hospital admission in 2007-08, while IV fluid consumption is decreased and ORS consumption Lt/Pt in 2007-08 is increased as compared to in the year 1996-97. Percentage of severely dehydrated patient is markedly decreased in 2007-08. Finally case fatality Rate (per1000) is grossly decreased in 2007-08. Similar finding was also found in a study of pediatric diarrhea in Rural Bangladesh (8).

This gross improvement of all above mentioned condition is due to impact of awareness of using ORT (ORS & other home available fluid) from the very beginning of onset of diarrhoeal disease. Each diarrhoeal patient during discharge from hospital are advised by nursing staff and other health workers about ORT and how to prepare and use ORS and other home available fluid during diarrhoeal episodes. When these patient return back to the community after discharge they also educate other member of the community regarding diarrhea and usefulness of ORT in the treatment of diarrhea. Mothers are also advised to continue feeding or increase breast feeding during, and after the diarrhoeal episodes. A study shows that after the educational intervention to the mothers there was significant improvement of knowledge regarding definition of diarrhea, signs of dehydration, awareness of ORS solution, correct preparation of ORS solution during diarrhea (9). The awareness programme of using ORT during diarrhea started mainly in West Bengal & other states of India started in 1982 with the help of WHO. During 1982-1988, a huge no. of workshop, seminars was arranged in all districts of West Bengal with the collaboration of WHO with State govt., Central govt. & many other NGOs. As a result of these activities on awareness programme of using ORT in diarrhea, the gross no. of diarrhoeal patients decreased in Hospital. Case fatality Rate also grossly decreased. The awareness programme significantly decreases the total number of diarrhoeal patient and diarrhoeal case fatality rate in our country.
REFERENCES

2. Park’s text book of Prevention & Social medicine, 18th edition, Table-2, i84 page