REPORT ON TECHNICAL ASSISTANCE BY ICDDR,B IN PREVENTION AND MANAGEMENT OF DIARRHOEA IN CYCLONE AFFECTED AREAS

Bilqis A.H., Siddique M., Sack R.B., Jahangir A., Nahid A.

Khatoon H., Hess J.

Summary:

On the 11th May the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) undertook a diarrhoea prevention and technical assistance programme in the cyclone affected area for the first time after the 29th April cyclone. Practical guidelines were developed for on surface water treatment. During field visits we identified serious faults in the quality of distributed water purifying tablets and their handling and storage. Water analysis indicated contamination of water in the areas. Differences in knowledge of how to manage diarrhoea and/or how to handle water-sanitation situations in post-disaster situations were observed among relief personnel.

Based on our experience from field activities which suggested an immediate need, we gave two one-day training courses to the relief personnel in the affected areas. These courses were aimed at training how to treat diarrhoea patients and how to manage water-sanitation activities under such situations. The courses were appreciated by the people.

Introduction

The cyclone of 1991, which mainly hit the coastal areas of Chittagong Division, Bangladesh, was one of the worst in the last 100 years. Preliminary statistics show that thousands of people have died and damage has been caused to properties worth millions of US$. In addition to these effects diarrhoea epidemics were reported from the cyclone affected areas.

As in previous years, ICDDR,B sent medical teams to the affected areas, treated people and collected stool specimens for bacteriological cultures. In addition, this year for the first time, ICDDR,B decided to provide technical assistance in water-sanitation aspects of the post-disaster activities. Although the original plan was only to develop practical guidelines for water treatment in the disaster areas, added were an assessment of the existing water sanitation situation and the provision of technical assistance were added.

Plan of action

This document briefly presents the post-disaster technical assistance provided to the relief personnel. The activities were done in three different phases: we (i) developed suggestions on practical water treatment methods, based on laboratory tests done at the Matlab laboratory of ICDDR,B (ii) visited cyclone affected areas and did some preliminary situation analysis, and (iii) based on the field experience, conducted training and did some laboratory analysis on water from the affected areas.

PHASE I: LABORATORY TESTS AT MATLAB LABORATORY
WATER TREATMENT BY BLEACHING POWDER:

Bleaching powder was bought from seven different shops, including one from a local shop at Matlab and six from Dhaka. These bleaching powders were tested for residual chlorine. The residual chlorine ranged from 0% to 28% in distilled water. Out of these nine samples of bleaching powder, only 2 showed residual chlorine. Moreover, the smell of chlorine and the physical appearance of the powder more or less correlated with the residual chlorine content. Therefore, one must be be careful in buying bleaching powder.

Out of these nine types of bleaching powder, three different types with the highest, medium and lowest amount of residual chlorine were selected for water treatment tests.

A batch of different water samples from tubewells, ponds, rivers, canals, and ditches were used for all the tests. Faecal coliforms in each of these water samples were measured. Solutions of the 3 different bleaching powders were separately added to each of these water samples to make three different concentrations: 5mg/l, 10mg/l and 25mg/l. After 30 minutes of contact time, faecal coliform counts of these water samples were determined.

The two batches of water which were treated with 25mg/l of bleaching powder with the highest and medium strength residual chlorine showed destruction of all fecal coliform bacteria in each of the different water samples. Residual chlorine in treated water ranged from 0.2-4 mg/l, but in pond water it was less than 1.5 mg/l. The fecal coliform count of these water

samples ranged from 10 to 80,000 colonies/100 ml of water.

Therefore, we concluded that surface water may be treated by adding 25mg/l of the medium to highest strength bleaching powder, and allowing a contact time of 30 minutes before use.

Water Treatment by Alum

Alum, which was powdered, was obtained from two different shops. 300 mg/l and 500 mg/l of each of the two types of alum was added to the water samples from the same sources as mentioned above under bleaching powder treatment. After 1 hour of contact time fecal coliform testing was done on these treated water samples.

The top clear water samples from the 500 mg/l alum batch showed more than 99% destruction of fecal coliform bacteria in every water sample from the different sources. Therefore, we concluded that when bleaching powder or water purifying tablets are not available, surface water treated with alum, 500mg/l, with over 1 hour of contact time may be drunk, provided the top clear water is carefully separated out for use.

Water treatment by Water Purifying Tablets

Two different types of chlorine based water purifying lets were tested. One tablet was added to 25 litres of water from the same multiple sources and allowed to sit for 30 minutes, as suggested.

One of the two types of tablets was found to destroy all fecal coliform colonies in every water sample. The other tablet was not effective in bacterial reduction. We concluded that one of these two kinds of water purifying tablets were still in good

conditions and the other should be discarded. We also found a correlation with some physical characteristics of the tablet and its potency.

Around this phase ICDDR,B developed a diarrhoea management and water-sanitation promotional leaflet to be distributed among the relief personnel.

PHASE II: VISIT TO THE CYCLONE AFFECTED AREA MAY 11-15, 1991

1. Meetings:

We met the following relief personnel: Relief coordinator, District Commissioner, Civil Surgeon, Chief Physician at the City Corporation, Chairman and Chief Engineer from WASA, Chief Chemist from the Dept. of Environment, Superintendent Engineer from the Directorate of Public Health Engineering, Personnel from NGOs: CARE, ADAB, CODEC, World Vision and CONCERN. We discussed their experiences and almost everyone mentioned a scarcity of safe water for drinking and other domestic purposes. Some of them also indicated the occurrence of a high diarrhoea incidence and the presence of corpses of humans and animals in the water.

2. Field visits:

We visited some places in the first graded affected areas, Anwara & Patanga and second graded affected areas, Patya and Halishahar. In these areas we interviewed local people, doctors at health complexes and NGO personnel. In these areas we tested the physical and chemical quality of distributed or available water, water purifying tablets and bleaching powder. We also

investigated sanitation practices. We also visited a children's hospital in the affected area.

Water supply:

The water purifying tablets and bleaching powder at health complexes and at NGO offices were not of acceptable standards. We noticed that these were not handled or stored properly, which could have affected the potency of the tablet.

We found that in the Anawara and Patanga areas most of the local people were asking for water purifying tablets and ORS packets. They were confused about the proper use of water purifying tablets as they were given different types of tablets which suggested different contact time and different amounts of water. The apparent quality of these distributed water purifying tablets were also not acceptable in most cases. We collected water purifying tablets from health complexes, NGOs and local people to be tested at our laboratory.

The salinity and conductivity of water from some submerged ponds were tested on-site and found beyond any acceptable standard. Although many tubewells, which were damaged were repaired we observed long ques at tubewell sites. Water scarcity, specially water for domestic purposes (including drinking), was acute. We saw tubewell water being sold at a village in Anwara.

Sanitation:

Personal hygiene or sanitation practices were hardly in the mind of relief personnel or local people. Even the cyclone

shelters or field-treatment centres did not construct sanitary latrines.

5. Diarrhoea management:

At health complexes we noticed a laxity in diarrhoea management. Doctors discussed their problems in the field management of diarrhoea patients.

In general, we observed a need for training the relief personnel in diarrhoea control from its prevention through essential water-sanitation related practices at all levels. A similar need was also expressed by the relief personnel and Government officials in relief activites.

We agreed to conduct such training courses with representatives from different relief organizations at our next visit. We also decided to do some more water analysis and therefore bring our portable equipment and test accessories on the trip.

PHASE III: TRAINING AND LABORATORY ACTIVITIES:

1. Training:

We conducted two one-day training courses at Chokoria and Chittagong city. These courses were designed to teach diarrhoea management and water-sanitation activities in post-disaster situations. A one-day course was also scheduled at Kutubdia, but due to bad weather hardly any helicopters flew to the area on that day. We returned from the Heliport.

About 100 relief personnel attended the courses. This included medical personnel (30%), public health personnel (50 %)

and relief administrators (20%) from Government bodies and NGOs. Professionals from ICDDR,B made three presentations; two related to diarrhoea and one related to water-sanitation issues. After every presentation the participants were encouraged to discuss their problems/experiences in the field. The post course evaluation report showed that 9% graded it fair and 91% good or excellent. About 19% felt that the diarrhoea management part, 21 % felt that the water-sanitation part and 60% felt that both parts were the best parts of the course. About 84% thought that a briefing, using similar materials, would be useful for personnel coming to do relief work.

2. Laboratory analysis

Water samples were collected from submerged tubewells, non-submerged tubewells, submerged ponds, non-submerged ponds and dewatered ponds filled with rain and/or ditch water. Feacal coliform count, PH, salinity, conductivity and chemical oxygen demand of each water sample were determined. These water sources from the Patanga area and Chittagong city areas.

The water from submerged ponds showed pollution levels beyond any acceptable standard. Water from submerged tubewells indicated slightly higher pollution than water from non-submerged tubewells. The chemical quality of the water from dewatered ponds was better than that from submerged ponds. But the fecal coliform counts still remained the same as in the submerged ponds. Further tests and analysis are in progress.

It was clear that tubewell water was relatively the best, but it was suggested to treat this water whenever possible. Pond water or any surface water presented a high risk. Dewatering of ponds would reduce the salinity and improve water quality some, but could still not be recommended for domestic use. However, ponds in general, in any part of the country, are highly polluted. The ponds may be disinfected before dewatering by using bleaching powder, but the level of treatment would depend on the amount of bleaching powder used and the methods practiced. Therefore, to be more effective the water should be collected from ponds, stored in a container and treated before use.

Caution:

Water purifying tablets were found in more than half of the tested cases to have lost their potency. Distributing agencies should be careful.

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