
ORIGINAL ARTICLE

The "Rose System" in Overcoming the Second Cholera Outbreak in Jakarta from May 25-30, 1976

by

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Abstract

1. a. During a short cholera outbreak in Jakarta from 25th May to 30th May, 1976, 70 children aged from 6 months to 13 years suffering from acute diarrhoea and dehydration, shock or pre-shock were admitted to the provisional Rehydration Centre in the outpatient section of the Department of Child Health, University of Indonesia/Dr. Cipto Mangunkusumo General Hospital, Jakarta.
- b. None died.
- c. 71.9% of the stool specimens from 32 patients revealed *Vibrio Cholera* El Tor Ogawa type.
2. The methodology used was the so-called "ROSE" system :
 - a. Rehydration with ringer's lactate solution.
 - b. Oralalyte in boiled water given ad libitum.
 - c. Oralalyte solution and intravenous solution given Simultaneously.
 - d. Education to the parents on the importance of giving oralalyte solution ad libitum.
3. This paper dealt with the second success of the Rose system in facing a cholera outbreak.

Introduction

There are so many kinds of infectious diseases which still need serious attention, especially in areas where sanitation is poor and fecal oral transmission is common.

Cholera is one of the most striking diseases in this group with often severe symptoms and a high potential for epidemic spread. One of the slums of Jakarta with poor sanitation, lack of water supply, bad garbage disposal system is located between a market heaped with rubbish, railway and a very contaminated Ciliwung river. An outbreak of acute diarrhoea caused by cholera happened in this area between 25th and 30th May, 1976. The death of 10 people was reported earlier because of lack of knowledge on how to overcome the diarrhoea.

Meanwhile, 70 patients, some with severe dehydration, pre-shock or shock were admitted in the Rehydration Centre (RC) of the Department of Child Health, Dr. Cipto Mangunkusumo General Hospital, Jakarta.

The purpose of this paper is to prove that death in acute gastroenteritis could be prevented by giving Ringer's lactate solution intravenously and oralyte ad libitum by mouth simultaneously, besides educating the mothers at the same time on the importance of oralyte. This method is called ROSE system (Ringer's lactate, Oralyte, Simultaneously, Education) (Suharjono, 1976). The excellent

results obtained showed that the system is perfect and that it can be applied anywhere else not depending on the people who carry it out.

Material and methods

Seventy children with gastroenteritis and dehydration, shock or pre-shock, varying in age between 6 months and 13 years, were admitted to the RC from 25th to 30th May, 1976.

They were clinically diagnosed or suspected as suffering from cholera which was confirmed later on in 23 (71.9%) out of 32 stool cultures (22 El Tor Oga-wa type, 1 El Tor Inaba type). The method of treatment used was the so-called Rose System (Suharjono, 1976).

The 4 principles of the system can be summarized under the following headings :

1. Rehydration

A single intravenous solution i.e. Ringer's (R) lactate solution is recommended. Intravenous fluid is given by means of a scalp vein (wing) needle or a vein on the dorsum of the wrist or ankle. Intravenous fluid rates are as follows :

- a. during the first hour: body weight in kg x 30 ml of fluid or 10 drops per kg body weight per minute,
- b. followed by 10 ml per kg body weight per hour in the next 7 hours or 3 drops per kg body weight per minute.

2. The second principle is introducing Oralyte (O) solution ad libitum.

3. The third is the simultaneous (S) application of the intravenous and oral fluids.

4. The fourth is the Education (E) to the parents particularly in giving the oralyte solution continuously and ad libitum.

Education on how to prevent diarrhoea by improving environmental sanitation should also be given at bedside in a simple manner. The parents were encouraged to give their children as soon as possible oralyte solution as soon as diarrhoea appears. Oralyte either in powder or in solution is available at the nearest health centre.

Tetracycline was given in a dosage of 40 mg/kg body weight/day every 6 hours. Most of the children were discharged after 12 hours of admission, which consisted of 8 hours of Ringer's lactate solution intravenously as well as oralyte solution ad libitum orally. In the next 4 hours mainly oral solution was given.

Three days thereafter they were followed up either in the Department of Child Health or at their homes.

Results

1. During the first 2 days (explosive period) 36 patients were admitted. The ages of these patients were above 2 years, mostly between 5 and 10 years (40.1%); 30.6% were of the age of 2 to 5, whereas 29.3% were older than 10 years.

2. In the following 4 days, another 34 patients were admitted of whom 15 were children under 2 years of age (44.0%).

3. There was no sex difference.

4. None of the 70 patients died.

5. 71.9% of 32 stool cultures showed microbiologically *Vibrio Cholera El Tor Ogawa* type positive.

Discussion

If a community is invaded by an infectious diarrhoeal disease such as cholera of a new serotype the main victims of the new infection are often older than 5 years of age. This trend is probably due to the fact that all age groups in the community are not immune to the new serotype and that adults are more likely to be exposed to the infection.

From the cases reported, the main victims of the first 2 days were 5 — 10 years old (40.1%) followed by cases of up to 2 years of age. The latter patients came from areas outside the cholera centre, and they had no classical cholera symptoms.

This experience showed that this outbreak was due to a different type (Ogawa type), whereas the first outbreak in February 1976 was caused by Inaba type (Suharjono et al., 1976). However, the source of both outbreaks was the same.

As we know, the enterotoxin of cholera stimulates adenyl cyclase. This ade-

nyl cyclase regulates cyclic AMP, which under physiological conditions is responsible for the secretion of anions from the epithelial cells through the action of various hormones. When the enterotoxin stimulates this enzyme, the level of cyclic AMP rises, which in turn leads to the excessive secretion of anion (Cl^-) into the lumen of the intestines. Thus, there is a continuous loss of body fluid and electrolytes from the body into the lumen, often resulting in large amounts of watery stools (Pierce, 1972).

Regardless of the etiologic pathogenic vibrios producing the toxin, there is very active excretion of mucus from the goblet cells, particularly during the early stages of diarrhoea, which creates small whitish particles in the watery stools.

This is called "rice water stools". On the other hand, the capacity of the intestinal epithelium is not impaired. This fact is used as reason of the oral rehydration treatment; if one can increase the absorption of salts from the intestinal fluid into the epithelium, the absorption of water and electrolytes will also be increased.

The sodium absorption is greater when glucose is added to the sodium solution. It is now obvious that a similar effect can be achieved in the intestines of many diarrhoeal patients (Watanabe, 1976). Oralyte or "bubuk garam diare" consists of glucose 22 gm/L, NaCl 3.3 gm/L, Na HCO₃ 2.5 gm/L and KCl 1.2

gm/L. This solution is very effective in oral treatment of dehydration (Rohde, 1974).

The simultaneous oral and intravenous rehydration has proved to be successful. The previous general attitude to starve gastroenteritis patients is no longer qualified. The parents must be taught to actively and continuously supply the oral fluid to their children (ad libitum). Vomiting is no hindrance.

Tetracyclin was still administered assuming that it is still potent to kill the vibrios.

Finally, factors which were important to obtain a zero mortality must be seriously considered. Those are :

1. The effectiveness and the efficiency of the Rose system.
2. The rapid response in providing giving sets and solution of the various disciplines especially from the ministry of Health.
3. The understanding and cooperation of the Head of the Child Health Department, the doctors, paramedical personnel in setting up and in running the provisional Rehydration Centre.
4. The aid of the parents in giving the oral solution to their children.
5. The rapid arrival of the patients in the hospital within 3 hours after onset of the diarrhoea.

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