

ORIGINAL ARTICLE

Comparison between 200 ml and 1 Liter Packages of Oral Rehydration Solution Prepared by Mothers of Patients with Diarrhea in the Oral Rehydration Room

by

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Abstract

To have a comparison between the preparation of oral rehydration solution (ORS) of 200 ml and 1 liter packages, a study had been done in 30 mothers of children under five years of age suffering from diarrhea who treated their children in oral rehydration room (group I) and 30 mothers of non diarrheal children under five years sampled in the out-patient Department of Child Health, Dr. Sardjito General Hospital (group II).

No significant difference was found ($p < 0.05$) concerning the sodium concentration in the ORS of 200 ml and in the 1 liter package (group I : 85.95 ± 16.07 , and 81.52 ± 16.21 , group II 98.11 ± 24.67 and 97.02 ± 21.87) (mEq/L, Mean \pm SD).

Of 30 mothers group II, 5 mothers (19.23%) made mistakes in preparing the 1 liter packages of ORS and the sodium concentration in this package was higher compared to the concentration in the 200 ml package.

There was no significant difference concerning diluted volume and the sodium concentration between group I and the recommended method, but there was a significant difference ($p < 0.005$) between group II and recommended method.

A significant difference was also found ($p < 0.001$) between group I and group II about the mothers knowledge of the effect of diarrhea, the use of ORS, the amount of ORS that must be given to the patients and the indications to refer the patients to the health center or hospital.

Introduction

Diarrhea is one of the most important health problems in the Indonesian population and ranks third in the list of reasons for going to the health center. The incidence of episodes is around 150 - 430 per 1000 populations per year, mostly (70-80%) occurring in children under 5 years of age (Teluk Sebodo et al., 1984; Adhyatma, 1984).

Most of diarrheal cases are without dehydration (90%) or have mild to moderate dehydration (2-8%), so that the most appropriate approach to manage diarrhea will be oral rehydration (Arini Soetomo and Bambang Winardi, 1982).

Oral rehydration treatment for patients with diarrhea must be started early at home by mothers (Rohde and Northrup, 1977), therefore the practice of oral rehydration treatment must be simple, cheap and acceptable for all people.

ORS with WHO standard composition is proved safe and effective in treating mild and moderate dehydration in acute diarrhea of all causes and in all age groups (Mahalanabis, 1981). ORS campaigns and informations had been given to the population (Brotowasisto, 1981).

Materials and Methods

The study was done in the Department of Paediatrics Dr. Sardjito General Hospital Yogyakarta, starting from Juli 1, 1986 until 30 respondents in each group were obtained.

The subject study were mothers of children with diarrhea under 5 years of age who had been informed about diarrhea and ORS in the ORR one day before (group I). The control group (group II) were mothers of non diarrheal children under 5 years of age who visited the outpatient department

The success of the use of ORS in the population from year to year is increasing, though some constraints still exist such as its packing and acceptability (Sunoto, 1982). The main constraint of ORS practice is the public reluctance so that information about the nature, advantages and use of ORS must be enhanced.

The oral rehydration room (ORR) in the Department of Pediatrics, Dr. Sardjito General Hospital is one form of the introduction of oral rehydration treatment to the hospital society.

The nowadays many sizes of ORS packing in the market and various sizes of glasses with its forms and volumes in the population is considered as worry as it may cause dilution errors (Sunoto, 1982). The error of dilution especially causing higher sodium concentration which may lead to hypernatremia is a serious threat.

The aim of this study is to compare dilutions of 200 ml and 1 liter ORS prepared by the mothers of patients with diarrhea in managing their children in ORR and to assess the mother's understanding about diarrhea and ORS.

on the same day.

The counseling in the ORR was given by the same personnel using a same counseling standard. The counseling material focussed on: the main effect of diarrhea, the amount of ORS that must be given to the patient and the method of preparing ORS/the proper dilution of ORS as well as information about glass size and volume variations and various ORS packages. While treating their children during 4 hours in the ORR, the mothers must practised to dilute

ORS.

The mother's knowledge and ability to dilute ORS was assessed on the next day when the mother brought their children to the hospital. The mother's knowledge was assessed by completing the questionnaires with the free interrogation guidance. The interrogation were done by the authors in a special place lasting 30 minutes for each mother, and constraint factors had to be avoided as much as possible. The answers were written down in the questionnaires.

The mother's ability to dilute ORS was assessed directly by her practice to dilute 200 ml and 1 liter ORS packages. The volume of the ORS dilution was determined with the help of a measuring glass and 50 ml fluid sample was taken for the examination of concentration. The ORR personnel also diluted ORS in the same manner which was

then used as the recommended dilution. ORS used here was from Prafa Laboratories with the composition in accordance with WHO recommendation.

Sodium concentration determination were done with the help of flame photometry in the Center of Physical and Chemical Analysis Laboratory Gajah Mada University.

Statistical analysis was done with the Chi-square and Student's t- test.

The informations about education level, the family income, location, number of children under 5 years of age and previous knowledge of ORS were taken from 30 mothers of children with diarrhea and from 30 mothers children with no diarrhea. No significant difference was found in the two groups as far as those data's are concerned.

Results

Table 1 : Range of dilution

	Oralit package 200 ml volume (ml)	Oralit package 1 L volume (ml)
1. ORR personnel	185 - 215 (199.33 ± 9.28)	930 - 1075 (997.66 ± 44.71)
2. Group I	170 - 225 (199.66 ± 13.78)	890 - 1180 1035.5 ± 72.61)
3. Group II	140 - 270 (183.65 ± 37.12)	700 - 1220 (911.42 ± 169.23)

ORR : oral rehydration room

There was no significant difference between the dilution of group I compared with the recommended dilution, but a significant difference ($p < 0.05$) was found between the result of dilution of group II and the recommended dilution.

Of 30 group II mothers: 4 mothers (13,3%) were not able to prepare ORS and 5 mothers (19.23%) made some errors

in preparing the 1 liter ORS package: 3 mothers diluted 1 spoonful ORS in water equivalent to 180 ml, 190 ml, and 200 ml respectively; 1 mother diluted 2 spoonfuls ORS in 240 ml and the other mother diluted 2 teaspoons ORS in 190 ml.

In group II, only 21 mothers (70%) had heard or known about ORS and only 19% had ever prepared oralit.

Table 2 : Sodium concentration in ORS

	200 ml ORS package (meq/liter)	1 liter ORS package (meq/liter)
1. ORR personnel	81.65 - 97.08 (88.08 ± 5.53)	81.39 - 97.30 (88.44 ± 5.04)
2. Group I	66.95 - 107.08 (85.95 ± 16.07)	61.91 - 102.56 (81.52 ± 16.21)
3. Group II	55.56 - 144.52 (98.11 ± 24.67)	53.26 - 127.87 (97.02 ± 21.87)

ORR : oral rehydration room

Sodium concentration of ORS in group I did not differ significantly from the recommended sodium concentration but the sodium concentration of ORS in group II showed significant difference from the recommended sodium concentration ($p < 0.05$).

No significant difference ($p < 0.05$) was found in sodium concentration between the 200 ml and 1 liter package either from

group I or group II.

Improper sodium concentration of ORS prepared by five mothers of group II were 55.56 - 102.17 in 200 ml package (78.46 ± 17.79 meq/L) and 53.26 - 87.43 in 1 liter package (65.05 ± 13.80 meq/L).

The amount of ORS used in 24 hours by patients with diarrhea of group I was 600 - 1450 ml (1091 ± 257 ml).

Table 3 : Mother's knowledge of the effect of diarrhea

The main untoward of Diarrhea in dehydration	Group I	Group II
• Understand	27	9
• Do not understand	3	21

There was a significant difference ($p < 0.001$) about the understanding of the risk of diarrhea between the two groups.

Table 4 : Mother's understanding of the reason of giving ORS to their children with diarrhea

ORS has a proper composition suitable for replacing fluid loss during a diarrhea period	Group I	Group II
• Understand	23	9
• Do not understand	7	27

The two groups showed a significant difference ($p < 0.001$).

Table 5 : Mother's understanding of the amount of ORS that must be given to patients with diarrhea

The amount of fluid that must be given is about the same as the fluid loss (until the sign of dehydration disappears)	Group I	Group II
• Understand	24	6
• Do not understand	6	24

The two groups showed a significant difference ($p < 0.001$).

Table 6 : The mother's understanding of patients condition that must be referred to the health center or hospital

The patient must be referred if there are signs of diarrhea with mucus/blood, dehydration or negative fluid balance (ORS avoidance, severe diarrhea/vomiting)	Group I	Group II
• Understand	26	12
• Do not understand	4	18

The two groups showed a significant difference ($p < 0.001$).

Discussion

ORS of WHO standard composition proved to be a safe and effective method to treat mild and moderate dehydrating acute diarrhea of all causes and in all age groups (Mahalanabis, 1981). The actual problem is how ORS with the proper method of preparing it can be accepted by the public so that the distribution of ORS to the public is easy without hesitation of unwanted side effect.

For this reason, beside the single composition we need also single packing of ORS so that it can be more accepted by the public.

From this study some result were found: the result of ORS dilution by mothers who were counselled in the ORR did not differ from what had been recommended. On the other hand, ORS prepared by mothers who were not counselled was different compared the method recommended and the sodium concentration in 200 ml and 1 L package tend to be higher than the proper sodium level.

Comparison of sodium concentration from the result of ORS done by group II showed that there was no significant difference between 200 ml and 1 liter package but if the sodium concentration of the ORS dilution prepared by the 5 mothers from group II was analyzed separately the result of the 1 liter dilution gave a deviation higher than that of the 200 ml ORS dilution.

It revealed that in group II only 21 mothers (70%) had ever heard or known of ORS and only 19% of mothers had ever prepared ORS. This was a little higher compared with a the study by Sahid et al (1982) revealing that from a group of mothers visiting the Mother and Child Health Clinic, Dr. Kariadi General Hospital, 54.67% had known ORS before and 9.03%

of them had been giving oralit to their children when suffering from diarrhea. The study of Bambang Winardi et al. (1982) in a sentinal areas showed that 48.2% of mothers had heard of ORS and 14.5% of them had ever used it. A study in a rural and suburban region in Sukohardjo and Wonogiri by Murtasid et al. (1981) showed that 94% of mothers had not known or ever heard of ORS yet.

The above data gave an impression that there is still not enough mothers who have heard or known ORS, and in our opinion the distribution of ORS, especially the 1 liter package, to the public without adequate counselling will give rise to adverse effects of more concentrated dilution. Though a further and more elaborate study is needed to clarify this problem. Considering the average use of ORS in 24 hours that was 1091 ± 257 ml, it seemed that from the cost aspect, 1 liter package of ORS will be more advantageous, though, we fully agree with the Third National Rehydration Seminar recommendation recommending two kinds of ORS package: 200 ml package for the public and 1 liter package for the hospital and health centers.

From the mother's understanding of diarrhea and ORS analysis some important points that should be understood by mothers about the management of children with diarrhea were :

1. The understanding that dehydration was the main untoward effect of patients with diarrhea.
2. The understanding of the advantages of ORS.
3. The understanding of the amount of ORS that had to be given to the patients.
4. The understanding of the grade of dehydration and the condition that had

to be referred to the health center or hospital.

A significant difference concerning the knowledge mentioned above was found between the group of mothers who were counselled in the ORR and group of mothers who were not counselled yet.

The management system of diarrhea in the ORR seemed to give a good result and the knowledge obtained would be accepted

by the mothers as they had to practice directly while they treated their children during 4 hours in the ORR.

A further study is needed to know in what extent the advantage of the treatment system is in the ORR and a follow up examination at a certain time about the extent of the knowledge of diarrhea and ORS of the mothers who had been counselled in the ORR.

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