

Comparison of Efficacy of Who Ors Solution with Hypoosmolar Solution in Pediatric Unit I of Services Hospital Lahore

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ABSTRACT

OBJECTIVES: To compare the resolution of hypoosmolar with WHO-ORS in children with acute watery diarrhea (AWD).

Place and Methods: A double-blind, randomized controlled study was performed at the Pediatrics Unit I Services Hospital, Lahore for the period of six months from July 2017 to December 2017 After verbal agreement 300 children between 2 months and 12 years matched the clinical case definition of AWD. The other half was randomized to receive a hypoosmolar ORS solution for one hundred fifty children while WHO received the standard ORS solution. Children with third degree severe dehydration, malnourishment, systemic infections and intravenous fluids received children according to Gomez classification were discarded from the study. Information about the effect of each treatment method was monitored for 6 hours. The effectiveness of the ORS and the development of hyponatremia are the outcome measures. The efficacy was measured as the need for vomiting, vomiting and unprogrammed intravenous fluids at the rate of sweating. The data were analyzed with SPSS 13 and Chi square test was applied to the outcome measures.

Findings: A total of 300 children from 450 children participated in the study; For this reason, the response rate was 66%. The mean age of the patients was 2.18. The ratio of males to females was 1:1. Decrease in the rate of clearance during and after treatment and decrease in need for unprogrammed intravenous fluids were statistically significant

in the group using hypoosmolar ORS. The decrease in hyponatremic development and vomiting episodes during the study period was not statistically significant in both groups.

Conclusion: In children with hypodermic SOR receiving AWD, the frequency of bowel movements is lower and less intravenous fluid is programmed than WHO standard ORS. The risk of developing hyponatremia did not matter.

Keywords: Oral rehydration solution, acute aqueous diarrhea, reduced osmolar ORS solution, hypoosmolar ORS solution, dehydration

INTRODUCTION

Acute watery diarrhea (AWD) is defined as 3 or more loose stools / day pass with less than 14 days. It is a common cause of morbidity and mortality especially in children under 5 in developing countries. More than 1.5 million children under five years of age continue to die each year as a result of AWD. The most common complication of acute aqueous diarrhea is dehydration, which can be prevented by the application of oral rehydration salt (SOR). The World Health Organization (WHO) has shown that estimates of diarrheal deaths in children have fallen from 4 to 6 million in 1980 and 1.8 million in 2000, since the adoption of oral rehydration therapy. WHO and UNICEF have proposed a unique glucose-based ORS formulation for the prevention and treatment of diarrhea dehydration for 25 years. Now, UNICEF has

opted for reduced osmolarity SOR due to low sodium and glucose content in the solute. Researchers have found that the use of hypoosmolar ORS is effective and safe in the treatment of AWD. Hahn and colleagues found that hypoosmolar ORS solution was associated with less programmed intravenous (IV) infusion, minor vomiting and lower GIT problems compared to WHO standard ORS. Similar observations were made by Pulungish et al. The CHOICE study group observed that treatment with hypoosmolar ORS solution was associated with a 33% reduction in unplanned intravenous therapy. Unfortunately, local experiments for hypoosmolar SOR solutions are lacking. For this reason, the aim of this study is to compare the efficacy of WHO's hypoosmolar standard ORS solution in children with acute watery diarrhea.

PATIENTS AND METHODS

This study was conducted at the Pediatric Unit-1 of Service Hospital, Lahore for a period of six months from July 2017 to December 2017. This is a randomized double-blind controlled study and the sample is calculated using a statistical calculator. WHO health. The sample was collected using an undesirable sampling technique. A total of 150 children fell because he refused to participate in the study. After receiving the patient's consent, a total of 300 children between 2 months and 12 years of age were recorded according to the clinical case definition of AWD (3 or more loose stools / days shorter than 14 days). One hundred and fifty children were randomized to receive hypoosmolar ORS solution (Group A), and 150 children received WHO standard ORS solution (Group B). The children were randomized by a research assistant (staff nurse) who knew the

codes of both SRO solutions. Neither the patient nor the researcher knew the codes. Children with third degree malnutrition and having received intravenous fluids were not included in the study. Information about the effect of each treatment group was monitored for 6 hours. The efficacy of the ORS and the development of hyponatremia ($\text{Na} < 135 \text{ mEq} / \text{L}$) is the outcome measure. The serum sodium level was measured before and 6 hours after SRO administration. The efficacy was measured as ORS acceptability (clearance rate, soft stool evacuation rate / 6 hours), vomiting (one or more vomiting episodes every 6 hours), and unplanned IV fluid need. However, patients who did not recover within 6 hours were treated according to the individual intake. Data entered by S.P.S.S. version14 for analysis. Sociodemographic data were presented as frequency tables. The outcome measures were chi-square tested.

RESULTS

150 patients with a size of 450 samples were rejected by the parents. For this reason, the response rate was 66%. The study population consisted of 300 AWD children from 2 months to 12 years. The most common age group was 1-1.9 years (46.4%). The proportion of men and women is almost equal in both groups. (Table I) Adequacy was measured as the rate of decontamination, vomiting, and the need for unplanned intravenous fluids.

TABLE I: Demographic variables in both treatment group (n=330)

Variable	Group A n(%)	Group B n(%)
Age (in Years)		
<1	43 (26)	42 (25)
1-1.9	74 (45)	79 (48)
2-4.9	35 (21)	32 (19)
5-12	13 (08)	12 (08)
Sex		
Male	83 (50)	82 (50)
Female	82 (50)	83 (50)

The clearance rate was significantly lower in the hypoosmolar group (Group A) than in the WHO standard ORS group (Group B) (p value 0.026). During the treatment, 33 patients were uneventful (15 out of group A and 18 out of group B). Statistically, both treatments were equally effective in reducing vomiting (p value 0.582). After 6 hours of treatment, 8 patients in group A needed intravenous fluids in 20 patients in group B (p value 0.014). There was no significant difference between groups in terms of hyponatremia (p value 0.65) (Table 2).

TABLE 2: Outcome variables (n=330)

Variable	Group A n(%)	Group B n(%)	p value
ACCEPTABILITY OF ORS			
Purging rate (Passage of stools per 6 hours)			0.026
<2	153 (93)	138 (84)	
2-3	11 (6)	23 (14)	
>3	1 (1)	4 (2)	
Vomiting during treatment			0.582
Yes	15 (10)	18 (11)	
No	150 (90)	147 (89)	
Need of unscheduled IV fluids			0.014
Yes	8(5)	20(12)	
No	157(95)	145(88)	
HYPONATREMIA AFTER TREATMENT			
Yes	40 (24)	34 (21)	0.065
No	125 (76)	131 (79)	

DISCUSSION

Oral rehydration solutions (ORS) have been used for centuries and have prevented millions of infant deaths from acute diarrhea. Later, various studies were conducted to develop a reduced osmolar ORS. This study compared the efficacy of both types of oral rehydration salt solutions (openness rate, vomiting, unplanned administration of intravenous fluids, and hyponatremia development) with results similar to those observed in other studies. A similar comparison was made by the CHOICE study group and Hahn et al. We found a markedly reduced clearance rate associated with the use of hypoosmolar SOR solution. Hahn et al. Low ozone quality ORS group reported low fecal production. Pulungish et al., Alam et al. And Dutta et al. Also supported our observations. However, the CHOICE study group found that treatment with low-osmolar ORS solution was not a significant effect on fecal output compared to WHO standard ORS solution. This study has shown that hypoosmolar SOR is better accepted for reduced need for reduced clearance rate and unplanned IV fluids. Although vomiting was more common in a group of children receiving the WHO standard ORS than in the hypoosmolar ORS group, it was not statistically significant. Hahn and colleagues also reported that there was less vomiting in the group of reduced osmolarity in six studies. This study found that the need for intravenous therapy in children receiving hyposomolar ORS was lower. The CHOICE study group found that treatment with reduced osmolar ORS solution was associated with a 33% reduction in the need for unplanned intravenous therapy. Hahn and his colleagues also supported our observations.

This study has shown that the use of hypoosmolar SOR is not a significant risk for developing hyponatremia. Similar findings Dutta et al. 11. However, Hahn et al. Reported symptomatic hyponatremia in three randomized clinical trials, but there were no significant differences between the two treatment groups. The present worker had some limitations. Due to the limited working time, we did not take into account the effect of the weather during the year. This work measures fecal production as frequency; more or less, in grams / kg of stool volume.

CONCLUSION

In children with acute aqueous diarrhea, hypo-osmolar ORS solution has better acceptance, less programmed intravenous fluids, and a lower stool frequency than the WHO standard ORS solution. The risk of developing hyponatremia did not matter. However, due to the limited sample size in the study, the results should be verified in studies that indicate more patients.

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