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ORIGINAL ARTICLE

To Determine Outcome of Probiotics in Treatment of Acute Diarrhoea in Children

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ABSTRACT

Aim: To determine outcome of probiotics in treatment of acute diarrhea in children aged 6 months to 5 years as compared to control
Setting: Department of Pediatrics, Khyber Teaching Hospital, Peshawar
Duration: From 23 May, 2019 to 23 Nov, 2019
Study design: Randomized Control Trial
Methodology: 200 children were divided in two equal groups. Group A were given Probiotics (Saccharomyces boulardii) in a dose of 250-500 mg daily in two divided doses for 5 days, in addition to oral rehydration solution 50-100ml and 100-200ml after each loose stool in child aged <2 years and >5 years respectively. Group B were given only oral rehydration solution in same amount as prescribed to Group A. All the children were followed up at day 4. Outcome was assessed in terms of duration of diarrhea and improvement in number of stools per day at the 5th day of presentation.
Results: In Group A, 92(92%) patients showed improvement while in Group B, 71(71%) patients showed improvement.
Conclusion: Probiotics are found to be significantly more effective in reducing the stool frequency in ac. diarrhea.
Keywords: Acute diarrhea, Probiotic, Saccharomyces boulardii (SB)

INTRODUCTION

In children, one of the leading cause of mortality <5 years of age is diarrhea all over the world. It is the second leading cause of death worldwide. In Pakistan, there are 500 deaths per day, and every child on average has 5-6 episodes of diarrhea annually[1]. Water and electrolytes loss resulting from loose motions is the main cause of morbidity and mortality in children and infants [2]. American Academy of Pediatrics, the Canadian Paediatric Society and the European Society for Gastroenterology, Hepatology and Nutrition recommend the use of oral rehydration therapy in children with mild to moderate dehydration. However there are many adjunctive therapies currently under trial and one of them is probiotics[3].

Probiotics, a live microbial preparations, provide a health benefit to the patient. It is suggested that probiotics increase the immunity in such a manner that it is directed towards protective responses in the patients. It builds up the necessary gut flora that is washed out due to increased intestinal motility in diarrhea[4,5].

The objective of the study was to determine outcome of probiotics in treatment of acute diarrhea in children aged 6 months to 5 years as compared to control.

METHODOLOGY

After permission from Ethical Committee, this randomized controlled trial was conducted in the Department of Pediatrics, Khyber Teaching Hospital, Peshawar from 23 May, 2019 to 23 Nov, 2019. A minimum sample size of 100 in each group was calculated. Sample technique used was non probability consecutive sampling.

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All the children presenting with acute diarrhea to emergency department with ages between 6 months to 5 years and with both gender were included in the study, while patients with diarrhea lasting more than 14 days, blood in stools, co morbidities, chronic disorders or immunosupressed children**,** treatment with probiotics in the preceding 2 weeks**,** diarrhea secondary to drug intake or allergy and Post surgical patients were excluded.

Data Collection Procedure: All the children fulfilling inclusion criteria were enrolled in the study through OPD and pediatric department, Khyber Teaching Hospital Peshawar. All the children were divided in into two groups. Group A was given Probiotics (Saccharomyces boulardii in a dose of 250-500 mg daily in 2 divided doses) for 5 days, in addition to oral rehydration solution 50-100ml and 100-200ml after each loose stool in child aged <2 years and >5 years respectively. Group B was given oral rehydration solution only in same amount prescribed to Group A. All the children were followed up at day 4 to assess outcome. Outcome was assessed in term of duration of diarrhea and improvement in number of stools per day, at the 5th day of presentation. All the analysis was done in SPSS Vr 22.

RESULTS

The detail of results is given in table 1—11

Table 1: Frequencies and Percentages for Age

Age Group	Group A	Group B	Total
6 months to 2 Yrs	60(60%)	60(60%)	120(60%)
3 to 5 Yrs	40(40%)	40(40%)	80(40%)

Table 2: Frequencies and Percentages for Gender

Gender	Group A	Group B	Total
Male	68 (68%)	68 (68%)	136 (68%)
Female	32 (32%)	32 (32%)	64 (32%)

Table 3: Descriptive statistics

Numerical Variables	Group A	Group B	Overall
Age	2±1.11	2±1.30	2±1.25
Duration of diarrhea	6±1.42	6±1.59	6±1.54
No of days in resolution	5±1.82	5±2.59	5±1.82

* P Value = 0.01 for number of days in resolution (*t* test).

Table 4: Frequencies and percentages for improvement

Improvement	Group A	Group B
Yes	92 (92%)	71 (71%)
No	08 (8%)	29 (29%)

P value 0.000131

Table 5: Frequencies and percentages for residence

Residence	Group A	Group B	Total
Urban	27 (27%)	54 (54%)	81 (40.5%)
Rural	73 (73%)	46 (46%)	119 (59.5%)

Table 6: Frequencies and percentages for socio economic status of parents

Socio economic status	Group A	Group B	Total
Poor	52 (52%)	35(35%)	87 (43.5%)
Middle Class	21 (21%)	44(44%)	65 (32.5%)
Rich	27 (27%)	21(21%)	48 (24%)
Total	100(100%)	100(100%)	200(100%)

Table 7: Frequencies and percentages for education level of parents

Education Level of Parents	Group A	Group B	Total
Illiterate	14 (14%)	26 (26%)	40 (20%)
Primary	58 (58%)	60 (60%)	118 (59%)
Secondary & Above	28 (28%)	14 (14%)	42 (21%)
Total	100(100%)	100(100%)	200 (100%)

Table 8: Stratification of Improvement with Respect to Age

Age	Improvement	Group A	Group B	P Value
6 months to 2 Years	Yes	55 (55%)	42 (42%)	0.0025
	No	05 (5%)	18 (18%)	
3 to 5 Years	Yes	37 (37%)	29 (29%)	0.018
	No	03 (3%)	11 (11%)	

Table 9: Stratification of Improvement with Respect to Gender

Gender	Improvement	Group A	Group B	P Value
Male	Yes	63 (63%)	47 (47%)	0.0004
	No	05 (5%)	21 (21%)	
Female	Yes	29 (5%)	24 (24%)	0.097
	No	03 (3%)	08 (8%)	

Table 10: Stratification of Improvement with respect to duration of diarrhea

Duration of Diarrhea	Improvement	Group A	Group B	P Value
< 5 Days	Yes	30 (30%)	18 (18%)	
	No	04 (4%)	08 (8%)	0.068
> 5 Days	Yes	62 (62%)	53 (53%)	0.0005
	No	04 (4%)	21 (21%)	

Table 11: Stratification of Improvement with respect to residence

Residence	Improvement	Group A	Group B	P Value
Urban	Yes	25(25%)	39 (39%)	0.338
	No	02 (2%)	15 (15%)	
Rural	Yes	67(67%)	32 (32%)	0.0015
	No	06 (6%)	14 (14%)	

DISCUSSION

In this study, in Group A, 60(60%) patients were between 6 months to 2 years of age while 40(40%) patients were in 3 to 5 years of age. In Group B, 60(60%) patients were between 6 months to 2 years of age while 40(40%) patients were in 3 to 5 years of age. In Group A, 68(68%) patients were male patients and 32 (32%) patients were female. In Group B, 68(68%) patients were male patients and 32 (32%) patients were female. In Group A, mean±SD for age was 2±1.11. Mean±SD for duration of diarrhea was 6±1.42. Mean±SD for number of days in resolution was 5±1.82. In Group B, mean±SDs for age was 2±1.30. Mean ± SDs for duration of diarrhea was 6±1.59. Mean±SDs for number of days in resolution was 5±2.59. In Group A, 92(92%) patients showed improvement while in Group B, 71(71%) patients showed improvement. In Group A, 27(27%) patients were from urban areas while 73(73%) patients were from rural areas. In Group B, 54(54%) patients were from urban areas, 46(46%) patients were from rural areas. In Group A, 52(52%) patients were from poor families, 21(21%) patients were from middle class families and 27(27%) patients were from rich families. In Group B, 35(35%) patients were from poor families, 44(44%) patients were from middle class families and 21 (21%) patients were from rich families. In Group A, parents of patients 14(14%) were illiterate, 58(58%) had primary education whereas 28(28%) had secondary and above education. In Group B, parents of 26(26%) patients were illiterate, 60(60%) patients had primary education, 14(14%) patients had secondary & above education.

According to one study, there was reduction in the duration of diarrhea in children treated with probiotics (4.7±2.5 days) as compared to control group (5.5±3.2 days). Moreover 96% of children treated with probiotics showed improvement in frequency of stools i.e, passed

<3 stools per day at day 4 of treatment as compared to 78% of control group. Stools came back to normal consistency in 76% of children treated with probiotics as compared to 24% patients in control group as compared to this study[1]. However there are no guidelines for the role of probiotics in children with diarrhea[6].

CONCLUSION

Probiotics are found to be significantly more effective in reducing the stool frequency in acute diarrhea.
Conflict of interest: Nil

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