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ORIGINAL ARTICLE

Comparison of Mean Duration of Diarrhea of Two Different Probiotics in Acute Diarrhea among Children: RCT

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ABSTRACT

Background: Diarrhea is one of the leading causes of morbidity and mortality and morbidity in paediatric age group.
Aim: To determine compare the mean duration of diarrhea in single strain (saccharomyces boulardii) and multiple strain probiotic in acute diarrhea in children.
Study Design: Randomized controlled trial.
Methodology: The current project was conducted at Department of Pediatrics, General Hospital, Lahore. The patients were randomly categorized in two groups. 5 billion lyophilized heat-killed multiple strain probiotic (Group-B) was given twice a day and 250 mg of saccharomyces boulardii (Group-A) was given twice a day. Data analyzed by using SPSS 15.0. Independent t-test was applied for comparison of mean duration of diarrhea between groups.
Results: The mean age of patients were 14.3 ± 4.19 months. The mean duration of diarrhea in Group A was 78.7±13.2 hrs whereas in Group B, mean duration of diarrhea was 97.6 ± 13.6 hrs.
Conclusion: Single strain saccharomyces boulardii significantly reduced the mean duration of diarrhea in children.
Keywords: Probiotics, Saccharomyces Boulardii, Acute Diarrhea and Children.

INTRODUCTION

Probiotic are living microbes that have healthy impact on hosts.[1] Literature review showed that these agents are fruitful in treatment of acute diarrhea among all especially children[2]. They work by numerous mechanisms like formation of antimicrobial substances, modifying toxin receptors, inhibiting pathogen growth, modulating immune response while inducing hydrolysis of toxins and receptors[2].

There are two types of probiotics i.e., single strain (Saccharomyces boulardii, Lactobacillus acidophilus) and multiple stain. Single strain agents are mainly employed in the treatment of various types of diarrhea especially acute diarrhea in children[3]. However, their role is reduction in duration of acute diarrhea[4-6].

They produce immunological, clinical, and microbiological effects in acute diarrhea[7]. One study showed that diarrhea settled significantly among children on day 3 who received saccharomyces boulardii group in comparison to group who received yogurt fluid (48.5% versus 25.5% respectively)[8]. However Ozlem Erdogen et al showed that clinical efficacy of Bifidobacterium lactis is significantly higher than saccharomyces boulardii (diarrhea resolved in 4.1 +/- 1.3 days than 6.6+/-1.7 days respectively)[9]. Other study showed single strain probiotics have better outcomes in treating acute diarrhea as results showed that diarrhea resolved earlier in the single strain saccharomyces boulardii group (58 hours vs 84.5 hours respectively; p=0.04)[10].

Globally, acute diarrhea is the commonest gastrointestinal health issue that causes most hospital admission in children under five years of age. Different studies have shown that the clinical efficacy of saccharomyces boulardii and other probiotic species differs from each other in the treatment of acute diarrhea[8-10]. Due to lack of available data in our community on this health issue, we planned current project.

The objective of the study was to determine compare the mean duration of diarrhea in single strain (saccharomyces boulardii) and multiple strain probiotic in acute diarrhea in children.

METHODOLOGY

Study held at Department of Pediatrics, General Hospital, Lahore after ethical approval. 200 patients fulfilling inclusion and exclusion criteria were included after informed consent from their parents/attendant and their demographic data like name, age, gender and address was noted. Group A: Single strain probiotic i.e., saccharomyces boulardii was given. Group B: Multiple strain probiotic was given. 5 billion lyophilized heat-killed multiple strain probiotic was given twice a day and 250 mg of saccharomyces boulardii was given twice a day. All patients received standard Oral Rehydration Solution. All data was collected on preformed Performa.

Statistical analysis: Data analysis was done SPSS v23. Parameter like duration of diarrhea was presented as Mean ± SD. Independent t-test was applied for comparison of mean duration of diarrhea between groups. P-value of ≤ 0.05 was taken as significant.

RESULTS

Parameters like gender distribution between groups were shown as frequency and percentage in table-1. The mean age of all patients was 14.3±4.19 months. Stratification for mean duration of diarrhea in both groups with regards to gender was done which shows that out of 100 treated cases in Group-A, mean duration of diarrhea in male patients (n=56) was 79.7±11.8 hrs as compared to 77.4±14.9 hrs in female patients (n=54) in the same group. Whereas out of 100 patients treated in Group B mean duration of diarrhea in male patients (n=52) was 99.6± 6.9 hrs as compared to 95.5±18.2 hrs in female patients (n=48) of the same group as shown in Table-2.

The result of the comparison of mean of group A and B treated with single strain probiotic Saccharomyces boulardii and multiple strain probiotic mixture respectively by applying the independent t test was p=0.05 as shown in table-3.

Table-1: Parameter Of All Subjects (n=200)

Parameters	Groups	Frequency	%age
Group-A	Males	56	56
	Females	44	44
Group-B	Males	52	52
	Females	48	48
Duration Of Diarrhea (Hours)	Single strain Saccharomycis Boulardii	Mean ± SD	
		78.7 ± 13.2	
	Multiple Strain	Mean ± SD	
		97.6 ± 13.6	

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Table-2: Comparison of mean duration of diarrhea between gender in both groups

Variables	Groups	Mean	Std. Deviation	P-value
Group-A	Males	79.78	11.83	0.06
	Females	77.43	14.97	
Group-B	Males	99.69	6.93	0.08
	Females	95.52	18.26	

Table 3: Comparison of mean duration of diarrhea between gender in both groups

Variables	Groups	Mean	Std. Deviation
Duration of diarrhea among groups	A	78.75	13.29
	B	97.69	13.69

P value 0.05, *Statistically Significant

DISCUSSION

The mean age of patients in our study was 14.3 ± 4.19 months and in agreement with an international study conducted by Damte Shimeli, Daniel Benti and Debela Challi[71] who found majority of the patients between 1-2 years of age.

In our study, both genders were included in the study and were randomly assigned in group A and B. The male to female child frequency in the sample was 54 to 46 percent respectively. Gender distribution of the patients was also done which shows i.e. 56% in Group-A and 52% in Group-B were male patients while 44% in Group-A and 48% in Group-B were female children showing that frequency of acute diarrhea was almost equal in both genders which is comparable to another recent study conducted by Sangita S Trivedia, Rajesh K Chudasamab, and Nehal Patela[11].

The mean duration of diarrhea in Group A i.e., the one treated with single strain probiotic saccharomyces boulardii was 78.7±13.2 hrs whereas the Group B was given multiple strain probiotic and the mean duration of diarrhea in this group was 97.6±13.6 hrs, and p value was computed as 0.05 which shows a statistically significantly result, the findings of the study are in agreement with a study showing that mean duration of duration of diarrhea with single strain probiotic saccharomyces boulardii is statistically significant than compared with the multiple strain probiotic (p=0.04 in single strain probiotic group than p=0.06 in multiple strain probiotic) in Grandy et al[12]. Saccharomyces boulardii was found to lessen mean duration of acute diarrhea thus this agent may reduce prolonged hospital stay due to diarrhea.

Limitations: We did not compare the adverse effects of the drugs and sample size was small.

CONCLUSION

We concluded that single strain saccharomyces boulardii significantly reduced the mean duration of diarrhea as compared to the multiple strain probiotic in acute diarrhea in children.

Author's contribution: SI& RSU: Conceptualized the study, analyzed the data, and formulated the initial draft, **NM & RO:** Contributed to the histomorphological evaluation, **FT&AM:** Contributed to the analysis of data and proofread the draft, **TL:** Contributed to the proofreading the manuscript for intellectual content

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