

# COMPARITIVE STUDY OF SACCHAROMYCES BOULARDII AND YOGURT FLUID IN ACUTE DIARRHEA

AMIR RASHID<sup>1</sup>, RIZWAN MAHMOOD<sup>2</sup>, USMAN RAFIQUE<sup>3</sup>, AGHA SHABBIR ALI

## ABSTRACT

**Objective:** The objective of this study was to determine the role of *Saccharomyces boulardii* and yogurt fluid in acute diarrhea in children.

**Material and Methods:** Duration of study was from 7<sup>th</sup> September, 2012 to 7<sup>th</sup> March, 2013 in the Department of Pediatrics, Lahore General Hospital, Lahore and it was a randomized controlled study.

**Results:** It was randomized controlled trial with sample size of 200 patients ranging from age 6 months to 2 years having diarrhea of less than 2 weeks. One hundred (group A) were treated with probiotic powder containing *Saccharomyces Boulardii* while one hundred (group B) were given Yogurt Fluid only. There was a difference of 1.91 days between these two groups ( $P = 0.001$ , table 4) and mean decrease in the frequency of Group A was  $4.189 \pm 0.470$  and for Group B was  $2.39 \pm 0.527$ .

**Conclusion:** This study concludes that *Saccharomyces boulardii* is more beneficial in acute diarrheal infection in children.

**Keywords:** Probiotics, *Saccharomyces Boulardii*, diarrhea,.

## INTRODUCTION

In children passage of 3 or more softer stools in a day or one watery stool is defined as diarrhea. It may be due to exaggerated intestinal movements<sup>1</sup>. 1.8 million deaths per year is seen with diarrhea<sup>2</sup>. 200,000 deaths per year is seen in Pakistan due to diarrhea<sup>3</sup>. Although there are many causes but Rotavirus, E.Coli and V. cholerae are amongst the commonly seen causes in our country<sup>4</sup>.

Management of diarrhea includes rehydration either orally or by IV fluids, zinc, adequate nutrition and probiotics<sup>5</sup>. There are many strains of probiotics which are used for treating diarrhea however in Pakistan *saccharomyces boulardii* is the most commonly studied probiotics but studies with its comparison with yogurt fluid are lacking and limited work on its comparison with yogurt fluid.

These probiotics are microorganisms which are used for health benefits. Probiotics may be used for treating antibiotic induced diarrhea and acute infectious diarrhea. Mode of action of these prebiotics is by changing the intestinal flora, halt the growth of pathogenic bacteria, enhance the digestion, and enhance resistance to pathogenic organism, stimulating the local immunity.

Alaa Kareem N in 2017 determined the effect of adding *S Boulardii* on yogurt quality and the results showed that there was marked improvement in the bacterial culture of the yogurt and its efficacy<sup>6</sup>.

The study “comparative study of *saccharomyces boulardii* and yogurt fluid” was conducted in pediatric ward of Lahore General Hospital Lahore. The purpose of this work was comparison between these two, *S boulardii* and yogurt fluid on mean change in frequency of stools and duration of hospitalization during their management of acute diarrhea.

This study proves that *S Boullardii* is more effective in controlling the diarrhea than yogurt fluid. So it can be effective to decrease hospital burden.

## MATERIAL AND METHODS

This study was carried out from 7<sup>th</sup> September, 2012 to 7<sup>th</sup> March, 2013 in the Department of Pediatric Medicine, Lahore General Hospital, Lahore. This was a randomized controlled study and there were 200 patients (100 in each group). An informed & written consent was taken from patient/parents and after approval of Ethical Committee of the hospital, study was conducted. Total number of patients was 200 (100 in each group) sampling was done by Non-probability consecutive method. Patients of diarrhea as per operational definition who were between 6 months and 2 years and duration of diarrhea less than 2 weeks were included in this study. Patients who were given antibiotics in the previous 2 days assessed on history, and those having co-morbid conditions like cardiac, respiratory or renal disease assessed on history and

physical examination, those having received anti-diarrheals and patients who were critically sick or had severe malnutrition all of them were excluded from this study.

After obtaining written consent from the parents/attendants, 200 cases of acute diarrhea fulfilling the inclusion criteria were included. Their information regarding name, age, sex etc was obtained.

Patients were randomized into two groups, (A) and (B). 100 patients in Group A were given *Saccharomyces boulardii* (250mg BD for five days) while 100 patients in group B were given yogurt fluid for 5 days, 15 mL BD for children < 2 years. Rehydration, adequate nutrition were provided to both groups. Clinical efficacy (as per operational definition) was recorded to 3 stools or less per day till day 5. This data was collected on a predefined proforma.

The data was analyzed by using SPSS version 11. Qualitative data including sex and clinical efficacy (as per operational definition) were presented as percentages and frequency. For quantitative data (age, and reduction in frequency of stools) mean, standard deviation were calculated and significance of clinical efficacy was calculated by applying chi-square test. P-value of  $\leq 0.05$  was significant. Clinical efficacy was determined by reduction in stool frequency per day.

## RESULTS

Mean age was  $14.44 \pm 5.087$  months for group A and  $13.02 \pm 4.888$  months for Group B with p-value 0.045. In group A 53 (53%) male, and 47 (47%) were female while in group B males were 51 (51%) and females 49 (49%). At admission the frequency of stools per day was  $14.46 \pm 0.52$  and  $12.0 \pm 0.44$  in group A and group B respectively (p-value 0.001).

**Table 1:** Mean $\pm$ SD of stool per day at admission: n=200

Characteristic	Group A	Group B	P-value
Mean $\pm$ SD	$14.46 \pm 0.52$	$12.0 \pm 0.44$	0.001

The mean diarrheal duration in group A was 1.8 days and in group B was 1.6 days (P = 0.29). (Table 2)

**Table 2:** Duration of diarrhea: n=200

Characteristic	Group A	Group B	P-value
Duration of diarrhea (days)	$1.8 \pm 1.2$	$1.65 \pm 0.8$	0.29

Total period of hospitalization was  $2.69 \pm 0.895$  days in group A and  $4.61 \pm 0.812$  days in Group B (P = 0.001). (Table 3)

**Table 3:** Duration of hospital stay. n=200

Characteristic	Group A	Group B	P-value
Hospitalization Period (days)	$2.69 \pm 0.895$	$4.61 \pm 0.812$	0.001

Mean decrease in stool frequency was  $4.1898 \pm 0.47048$  times for the group A and  $4.61 \pm 0.812$  times for the group B with p-value 0.001. (Table 4).

**Table 4:** Reduction in stool frequency. n=200

Characteristic	Group A	Group B	P-value
Mean decrease in stool frequency	$4.189 \pm 0.470$	$2.3959 \pm 0.527$	0.001

## DISCUSSION

Diarrhea in developed country is self-remitting condition but in developing countries many complications and morbidity are associated with it<sup>2</sup>.

Bifidobacterium and Lactobacillus have an essential role in modulating intestinal mucosa and immunity. Role of probiotics in reducing morbidity and mortality in developing countries is important. Not all probiotics available in the market are effective in diarrhea. Pediatricians should choose bacterial preparations which give better response.<sup>8</sup>

This is the most likely first study of its kind in children with diarrhea in LGH, Lahore. Proven role of which is justified by our data. Results of this study showed that by giving *Saccharomyces* for 5 days to children in acute diarrhea is effective in both reducing the frequency and duration of diarrhea during the hospital stay. This study shows that hospital stay was  $2.69 \pm 0.895$  days and  $4.61 \pm 0.812$  days for group A and B respectively (table 3). Between group A and B the mean difference was 1.91 days (P = 0.001). The difference between group A and B regarding the frequency of stool was  $4.19 \pm 0.47$  and  $2.39 \pm 0.527$  respectively (table 4). So stool difference of 1.8 was statistically significant (P = 0.001).

Among 200 children 96 were female and 104 were male. Statistically there is no difference in effect of drug (*Saccharomyces*) on improvement of diarrhea in between genders of both A and B group. Ozlem et al. has same results in his study showing 49.3% males and 50.7% females<sup>9</sup>.

Many studies were conducted in different regions of the world regarding the use of probiotics in diarrhea, one of these was a meta-analysis study conducted by department of international health, JH Bloomberg School of Public Health, USA and in New Delhi, India, Annamalai University, in 2006. Their results showed

that risk of travelers' diarrhea was reduced by 8% and antibiotic-associated diarrhea by 52% by using probiotics.<sup>6</sup> In Turkey, comparative study done between clinical efficacy of *S.boulardii* & yogurt which showed that diarrhea had resolved i.e stools  $\leq 3$  on day 3 with *S. boulardii* group & yogurt group by 48.5% & 25.5% respectively<sup>10</sup>. Other studies regarding the use of probiotics shows that there is reduction in the duration of acute diarrhea,<sup>10,11</sup> however many studies show little effect on duration.<sup>12,13,14</sup>

Eren M<sup>15</sup> and his colleagues studied in 2010 that yogurt treatment was cheaper than *S Boulardii*. Morgambal P, et al concluded that a dose of 250 mg of *S Boulardii*, twice a day shows better results<sup>16</sup>.

Some lacking in our study is due to small sample size and lack of data on the etiology of diarrhea, due to which we were unable to specify the probiotics role in different types of diarrhea. However in our study no adverse effects on the use of probiotics and yogurt fluid was seen.

Our study proves the efficacy of *Saccharomyces boulardii* in treatment of acute diarrhea as compared to yogurt alone.

## CONCLUSION

This study concludes that *Saccharomyces boulardii* is effective in acute diarrheal infection in young children, so it should be prescribed for acute gastroenteritis in children as compared to yogurt. However the use of probiotic is not economically affordable for many families. To make more acceptable economically, probiotics may be added to fluids like oral rehydration solutions. Our recommendation after results of this study is that if we manufacture yogurt which contains the same probiotic species, can solve the economical problem of our country, regarding cost.

## REFERENCES

- Majeed R, Shamsi HA, Rajar U. Clinical manifestations of hypokalemia. *J Liaquat Uni Med Health Sci* 2006; 5: 50-3.
- Bhutta ZA. Acute gastroenteritis in children. In: Kleigman RM, Behrman RE, Janson HB, Stanton BF, editors. *Nelson textbook of pediatrics*. 18<sup>th</sup> ed. Philadelphia: Saunders, 2007: 1605-20.
- Billoo AG, Memon MA, Khaskheli SA, Murtaza G, Iqbal K, Shekhani MS, et al. Role of a probiotic (*Saccharomyces boulardii*) in management and prevention of diarrhoea. *World J Gastroenterol* 2006; 12: 4557-4560.
- Mahmood R, Khalid Y, Iqbal SMJ, Masood T. Complications of acute diarrhea in malnourished children. *Ann King Edward Med Coll* 2006; 12: 307-9.
- Bhatnagar S, Alam S and Gupta P. Management of acute diarrhea: From evidence to policy. *Indian Pediatrics* 2010; 47 : 215-17.
- Alaa Kareem Niamah, physicochemical and microbial characteristics of yogurt fluid with added *S Boulardii*, ISSN:2347-467X, Vol.5, no (3) 2017, pg. 300-307.
- Theodoros Kelesidis, Charalabos Pothoulakis. Efficacy and safety of the probiotic *Saccharomyces boulardii* for the prevention and therapy of gastrointestinal disorders. *Therap Adv Gastroenterol*. 2012 March; 5(2): 111–125.
- Madsen K. Probiotics in critically ill patients. *J Clin Gastroenterol* 2008; 42: S116-8.
- Comparison of effectiveness of two different probiotics in rotavirus gastroenteritis in children, Ozlerm et al, *general of tropical medicine vol* 2106, 5 pages.
- Thomsen M. Probiotics Enhancing Health With Beneficial Bacteria. *Alternative and Complementary Therapies* 2006; 12: 14-20.
- Htwe K, Yee KS, Tin M, Vandenplas Y. Effect of *Saccharomyces boulardii* in the treatment of acute watery diarrhea in Myanmar children: a randomized controlled study. *Am J Trop Med Hyg* 2008;78: 214-6.
- Khanna V, Alam S, Malik A, Malik A. Efficacy of tyndalized *Lactobacillus acidophilus* in acute diarrhea. *Indian J Pediatr* 2005; 72: 935-8.
- Pashapour N, Iou SG. Evaluation of yogurt effect on acute diarrhea in 6-24-month-old hospitalized infants. *Turk J Pediatr*. 2006;48: 115-8.
- Sipsas NV, Zonios DI, Kordossis T. Safety of *Lactobacillus* strains used as probiotics agents. *Clin Infect Dis* 2002; 34: 1283-4.
- Eran M Dinleyici EC, Vandenplas Y, clinical efficacy comparison of *S Boulardii* and yogurt fluid in acute non bloody diarrhea in children: a randomized, control, open label study, *Am J Trop Med Hyg*. 2010 Mar; 82 (3): 488-91.
- Morgambal Padayachee, Janicke Visser, Estelle Viljoen, Alfred Musekiwa & Ren'ee Blaauw (2018) efficacy and safety of *S Boulardii* in the treatment of acute gastroenteritis in pediatric population; a systemic review, *South Journal of clinical Nutrition*.