

COMPARATIVE STUDY ON EFFICACY OF REGULAR AND PROBIOTIC YOGURT IN PATIENTS WITH ACUTE WATERY DIARRHEA IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Background: Acute diarrhea episodes are mostly caused by viruses, with rotavirus being the most common in both affluent and developing nations. **Materials and Methods:** A total of 64 patients were included. The patients were randomly grouped into Group A and Group B. Group A patients were advised to consume regular yogurt (250 mg twice a day) and Group B patients were advised to consume probiotic yogurt (250 mg twice a day). **Result:** Patients in Group A were 34.33 ± 8.21 years old on average, whereas those in Group B were 35.64 ± 9.36 years old. Five patients in Group A and four in Group B suffered from malnutrition. Eleven patients in Group A and fifteen in Group B had dehydration. At admission, Group A had a daily stool frequency of 6.72 while Group B had a daily stool frequency of 5.94. Significant stool reductions occurred in groups A and B over a period of 2.11 and 1.43 days, respectively. Stool normalization took 4.13 days for group A and 3.16 days for group B. Group A experienced diarrhea for 4.04 days, while Group B experienced it for 3.01 days. The findings showed statistical significance ($p < 0.02$). **Conclusion:** Group B experienced diarrhea for a shorter period of time overall than group A. Stool frequency and composition returned to normal more quickly in group B patients. A large-scale, placebo-controlled clinical investigation assessing the effectiveness of probiotic yogurt should validate these findings.

INTRODUCTION

The second most frequent infectious disease in children, diarrhea contributes significantly to morbidity, death, and hospitalizations.^[1] Acute diarrhea episodes are mostly caused by viruses, with rotavirus being the most common in both affluent and developing nations. An estimated 600,000 deaths and 40% of hospitalizations for diarrhea in children under five are caused by rotavirus-associated diarrhea worldwide each year. Probiotics are live microorganisms that improve the qualities of gut flora and offer health benefits to the human when given in sufficient quantities.^[2] It should be noted that the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) provided a definition of probiotics that classifies them based on the effects they cause rather than the bacterial strain's human origin.^[3] The use of probiotics is becoming more and more common these days, yet there has been evidence of their use since antiquity. Probiotics are frequently advised on the grounds that consuming

"healthy" bacteria may lessen the disruption of the gut microbiota and the ensuing diarrhea. Similar to medications, different probiotics have distinct effects and modes of action.^[4] Probiotics have been utilized in several clinical trials to prevent AAD. A variety of probiotics have been utilized in these investigations, with varying degrees of success.^[5] Because the studies in meta-analyses are not all the same, the results are inconclusive. AAD was significantly reduced by using probiotics, specifically *Lactobacillus rhamnosus* GG (LGG) and *Saccharomyces boulardii*, according to subgroup analyses of the meta-analyses.^[6,7] These probiotics have been administered in a variety of ways, including as yogurts, pills, and capsules. Doses range from 107 to 1010 colony-forming units (CFU), and the organisms utilized vary from single species to multi-species mixtures.^[8,9] For the purpose to evaluate the effectiveness of probiotic and normal yogurt in treating patients with acute watery diarrhea, the current study was designed.

MATERIALS AND METHODS

The present study was conducted in the Department of General Medicine, World College of Medical Sciences Research & Hospital, Jhajjar during the period of March, 2023 to February, 2024. A total of 64 patients were included. The patients were randomly grouped into Group A and Group B. Group A patients were advised to consume regular yogurt (250 mg twice a day) and Group B patients were advised to consume probiotic yogurt (250 mg twice a day). A pediatric gastroenterologist reviewed each patient upon admission, and the same physician reassessed each morning until the diarrhea subsided and the patient was discharged. Records were kept of the following: demographic information, nutritional condition, stage of dehydration, length of diarrhea, quantity and consistency of feces, length of vomiting episodes, and length of hospital stay. Before the study started, the institute's ethical board granted the study its ethical clearance. Patients with acute watery diarrhea who were admitted to the general medicine ward were included in the study. Three or more liquid or loose stools per day for fewer than 14 days was considered acute diarrhea. Patients who had been treated with antibiotics within the previous seven days, had a history of chronic, uncontrolled intestinal diseases like celiac disease, pancreatic insufficiency, parasitic infestations, or had bacterial diarrhea suspected by the presence of leukocytes and erythrocytes in stool examination within two to three hours of admission were excluded. With SPSS version-21 for Windows, the data was statistically analyzed. The significance of the data was examined using the Chi-square and Student's t-tests. Statistical significance was predefined as a p-value of less than 0.05.

RESULTS

A total of 64 patients were included in the study. The clinical findings and demographic information at admission are displayed in Table 1. There were 14 ladies and 18 males in Group A. There were 13 females and 19 males in Group B. Patients in Group A were 34.33 ± 8.21 years old on average, whereas those in Group B were 35.64 ± 9.36 years old. Five patients in Group A and four in Group B suffered from malnutrition. Eleven patients in Group A and fifteen in Group B had dehydration. At admission, Group A had a daily stool frequency of 6.72 while Group B had a daily stool frequency of 5.94.

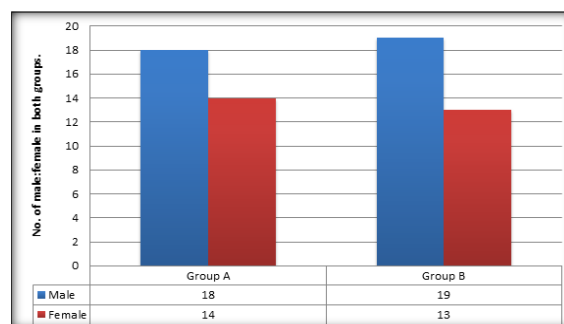


Figure 1: Shows the distribution of patients a/c to gender

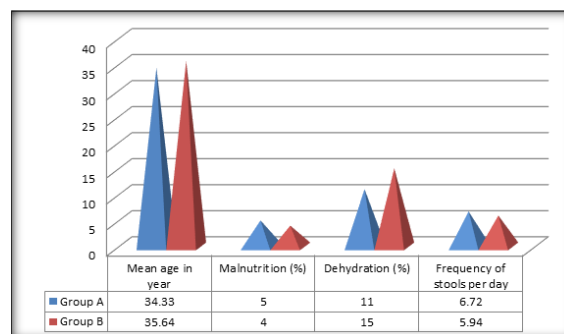


Figure 2: Shows the Test outcomes and demographic information at admission

Following the consumption of both ordinary and probiotic yogurt, the patients' features are displayed in Table 2. Significant stool reductions occurred in groups A and B over a period of 2.11 and 1.43 days, respectively. Stool normalization took 4.13 days for group A and 3.16 days for group B. Group A experienced diarrhea for 4.04 days, while Group B experienced it for 3.01 days. The findings showed statistical significance ($p < 0.02$).

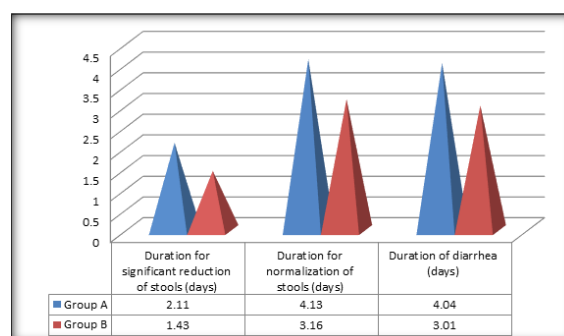


Figure 3: Shows the patients' characteristics following consumption of both normal and probiotic yogurt

DISCUSSION

The effectiveness of probiotic and normal yogurt in treating individuals with acute watery diarrhea was examined in this study. We found that individuals in Group B, who received 250 mg of probiotic yogurt twice day, had a reduction in symptoms sooner. The symptoms were significantly reduced in group A patients who received 250 mg of ordinary yogurt as well, but the probiotic yogurt was more effective.

There was statistical significance in the results. The findings were deemed noteworthy after being compared to those of earlier research. The usage of a locally made yogurt with a lyophilized probiotic added was documented by Grandy G et al. Children aged 10 to 35 months participated in a randomized, double-blind, and controlled clinical trial at the Paediatric Centre Albina Patiño in Cochabamba, Bolivia, for children hospitalized with acute diarrhea.^[10] Children were randomized to receive either a yogurt mixture containing *Lactobacillus rhamnosus* (yogurt group) or an oral rehydration solution with *Saccharomyces boulardii* (positive control). The length of the diarrhea was the main result. Hospitalization, vomiting, and the length of the fever were secondary outcomes. 42 out of the 74 children that were included finished the protocol; the two groups' baseline characteristics were comparable. Between the children who had yogurt (71 hours) and the controls (79 hours), the median duration of diarrhea was comparable. The mean duration of vomiting was 17 hours compared to 32 hours in the control group, and the mean duration of fever was similar in both groups: yogurt (11 hours) or *S. boulardii* (24 hours). On the third day, there was a noticeable difference in the number of daily bowel motions; the probiotic group had less. The length of hospitalization was unaffected. The use of a yogurt containing *L. rhamnosus* was found to have an effect similar to that of *S. boulardii*. Regardless of the cause, introducing yoghurt with a probiotic into the diet of hospitalized patients with severe diarrhea may help shorten its length. Fox MJ et al. calculated how effective probiotic yogurt was at preventing antibiotic-associated diarrhea in kids when compared to pasteurized yogurt. Between September 2009 and 2012, a multisite, double-blind, randomised, placebo-controlled clinical trial was carried out. In Launceston, Tasmania, Australia, pharmacies and general offices participated in the study. For the same amount of time as their antibiotic treatment, children (ages 1–12) who were prescribed antibiotics were randomly assigned to receive 200 g/day of either probiotic yogurt (containing *Lactobacillus rhamnosus* GG (LGG), *Bifidobacterium lactis* (Bb-12), and *Lactobacillus acidophilus* (La-5) or a pasteurized yogurt (placebo). For the period of treatment plus an additional week, stool frequency and consistency were noted. Frequency and consistency of stools, categorized according to the severity of the diarrhea, were the main outcomes. Fisher's exact analysis was used to compare groups because there were relatively few occurrences of diarrhea. The trial started with 72 kids and ended with 70 kids (36 placebo and 34 probiotic). The probiotic group experienced no cases of severe diarrhea (stool consistency ≥ 6 , ≥ 3 stools/day for ≥ 2 days in a row), while the placebo group experienced six cases. Additionally, the probiotic group experienced just one incident of mild diarrhea (stool consistency ≥ 5 , ≥ 2 stools/day for ≥ 2 days), while the placebo group experienced

21 episodes. Adverse events were less common in the probiotic group (1 stomach pain, 1 vomiting, and 1 headache) than in the placebo group (6 stomach pain, 4 appetite loss, and 1 nausea). They came to the conclusion that a yogurt containing LGG, La-5, and Bb-12 is a useful way to lower the prevalence of antibiotic-associated diarrhea in kids.^[11] Eren M. et al. assessed *Saccharomyces boulardii*'s clinical effectiveness and cost/effectiveness in treating children's acute non-bloody diarrhea in comparison to yogurt fluid (YF). There are 55 children in this prospective, randomized, open-label clinical research (mean age 21.2 ± 28.2 months; 19 females, 36 boys). Lyophilized *S. boulardii* was given to group A (N = 28), while YF was given to group B (N = 27). While the hospital stay was shorter with YF, the length of diarrhea was shorter with *S. boulardii*; nevertheless, these changes were not statistically significant. On day three, however, a considerably greater number of children in the *S. boulardii* group had recovered from their diarrhea. Yogurt treatment was less expensive than *S. boulardii* in outpatient cases, although treatment costs were comparable for hospitalized patients. In conclusion, when it came to treating acute non-bloody diarrhea in children, the impact of daily freshly made YF was similar to that of *S. boulardii*. In the *S. boulardii* group, the number of patients with regular feces on day three was considerably greater, indicating a shorter duration of diarrhea. The effects of probiotics in treating and preventing acute infectious diarrhea in babies and children were evaluated by Szajewska H et al. based on data from randomized controlled trials.^[12] A comprehensive analysis of published, double-blind, randomized, placebo-controlled studies on the use of probiotics to treat or prevent acute diarrhea in children and babies, which is defined as more than three loose or watery stools in a 24-hour period. Probiotic use was linked to a considerably lower risk of diarrhea lasting longer than three days when compared to placebo. In a fixed-effect model, the pooled estimate risk was 0.43; in a random-effect model, it remained significant. The only one with a consistent impact was *Lactobacillus* GG. Particularly in rotaviral gastroenteritis, probiotics dramatically shortened the length of diarrhea when compared to a placebo; the pooled, weighted, mean difference (WMD), assuming the random-effect model, was -20.1 hours and -24.8 hours, respectively. Due to the substantial clinical and statistical heterogeneity, a meta-analysis of the preventative studies was not practical.^[13] They came to the conclusion that probiotics have been shown to have a clinically meaningful advantage in treating acute infectious diarrhea in children and infants, especially rotaviral gastroenteritis. While other probiotic strains might also work, *Lactobacillus* GG demonstrated the most consistent benefit. More investigation is required. It is impossible to draw definitive conclusions regarding the effectiveness of probiotics in avoiding

acute gastroenteritis due to the clinical and statistical heterogeneity of the prophylactic therapies.^[14]

CONCLUSION

Based on the study's limitations, we deduce that group B experienced diarrhea for a shorter total period than group A. Stool frequency and composition returned to normal more quickly in group B patients. A large-scale, placebo-controlled clinical investigation assessing the effectiveness of probiotic yogurt should validate these findings.

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