

Estimation of Streptococcus Mitis Level in Saliva Before and After Consumption of Probiotic Curd among School Children

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Abstract: ***Background:** Dental caries can be prevented at an earlier stage by usage of probiotic products. **Objectives:** To compare and evaluate the levels of salivary streptococcus mitis before and after consumption of probiotic curd. **Materials and Methods:** Thirty children of age group 10-12 years were selected and divided equally into Group I and II. They were given 200 gm probiotic curd and normal curd for 7 days, respectively. Collection and analysis of saliva samples was done at baseline, 1 hour after consumption and on the 7th day. Number of colonies were counted and subjected to statistical analysis. **Results:** Study showed reduction in salivary mitis streptococci counts in saliva after 1 hour and on the 7th day in the probiotic group. Results were found to be statistically significant. **Conclusion:** Daily use of probiotic products can help in prevention of enamel demineralization.*

Keywords: Probiotics, Saliva, Salivary Streptococcus Mitis

1. Introduction

Probiotics can be defined as living microbes, or as food ingredients containing living microbes, that beneficially influence the health of the host when used in adequate numbers [1].

Traditionally, probiotics have been associated with gut health, and most clinical interest has focused on the prevention or treatment of gastrointestinal infections and diseases; however, during the last decade [2] [3], several investigators have also suggested probiotics for oral health purposes [4].

Probiotics have a role in maintaining oral health through interaction with oral microbiome, thus contributing to healthy microbial equilibrium [5]. The use of probiotics in dentistry has shown to reduce the cariogenic biofilm in various studies. Probiotic strains may help in preventing new caries in already treated population [6]. The various means by which probiotics can be administered for oral health purpose are: cheese, yoghurt, lozenges, tablets, mouth rinse and capsule [7].

Hence, the present study was planned to compare and evaluate levels of salivary streptococcus mitis before & after consumption of probiotic curd.

2. Objectives

To compare and evaluate the levels of salivary streptococcus mitis before and after consumption of probiotic curd.

3. Materials and Methods

Thirty children were randomly selected from Residential School, Bagalkot, Karnataka for the study. The children were selected and equally divided into Group I (probiotic curd group) and Group II (plain curd group) comprising 15 children in each group, who were given 200 g probiotic curd (which contained B. lactis 12) and plain curd, respectively, for 7 days. Subjects were given probiotic curd to consume once daily and were instructed to refrain curd consumption any other time. The subjects were, however, encouraged to maintain their normal oral hygiene habits. No tooth brushing was allowed for at least 1 hour after eating the curd.

3.1 Inclusion criteria

- Age group of the children was 12–14 years
- All permanent teeth should have been erupted (except 3rd molars)
- No clinically detectable caries
- No history of any preventive dental treatment
- Children must be present on the day of examination
- Informed consent from the parent/guardian was obtained.

3.2 Exclusion criteria

- Severely ill children
- Medically compromised children
- Children who had been on medication in the last 6 months
- Children undergoing orthodontic treatment.

Ethical clearance was obtained prior to the start of the study from the ethical committee of P.M.N.M Dental College and Hospital, Bagalkot, Karnataka.

3.3 Study design

Collection of saliva was done after the clinical examination. Children were made comfortable and asked to swallow pre-existing saliva in order to clear the mouth of any residual saliva. Syringe method was used to collect the saliva into the sterile hard RTF vials. All the saliva samples of participants were decoded during the period of sample collection and processing. The samples collected were handed over to the Microbiology Department of Maratha Mandal Dental College and Hospital, Belgaum for analysis on the same day. The samples were pre-coded and not disclosed to the technician. In the laboratory, samples were stored at room temperature (17°C–25°C) prior to the analysis.

Assessment of saliva was done at baseline, at 1 hour, and on the 7th day. Sample was inoculated on Blood agar and Mitis salivarius mediums. The plates were incubated at 37°C anaerobically. Colony characteristics were studied after 72 hours. Streptococcus mitis in saliva was determined by using a colony counter and the number of colony forming units was counted.

3.4 Statistical analyses

Statistical Package for Social Sciences [SPSS] for Windows, Version 22.0. Released 2013. Armonk, NY: IBM Corp., was used to perform statistical analyses. Mann Whitney U Test was used to compare the mean Streptococcus Mitis Count [x 10³] between Normal & Probiotic Group. Friedman's Test followed by Wilcoxon Signed Rank Test was used to

compare the mean Streptococcus Mitis Count [x 10³] between different time intervals in Normal and Probiotics group. The level of significance [P-Value] was set at P<0.05.

4. Results

In this study, mean salivary mitis streptococci count at baseline for probiotic curd and plain curd groups was 220 and 145, respectively. Mean salivary mitis streptococci count at 1 hour after consumption of probiotic curd and plain curd was 86.63 and 133.63, respectively. When compared after 7 days, mean salivary mitis streptococci count after consumption of probiotic curd and plain curd was 21.88 and 111.25, respectively (Figure-1). When comparison of the mean salivary mitis streptococci was done 1 hour and 7 days after consumption of probiotic and plain curd, the results were found to be statistically significant (Table-1).

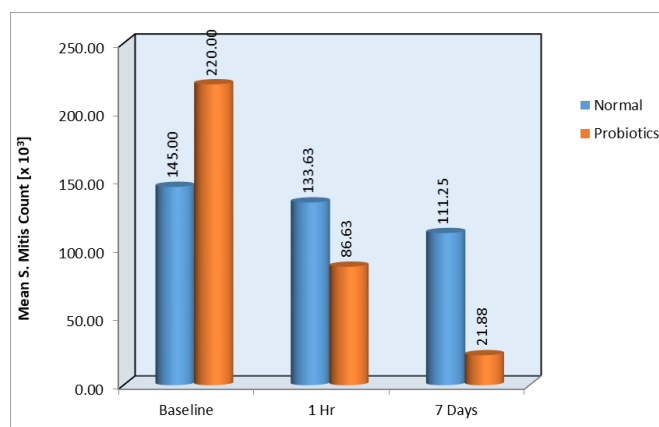


Figure 1: Comparison of mean Streptococcus Mitis Count [x 10³] between Normal & Probiotic Group

Table 1: Comparison of mean Streptococcus Mitis Count [x 10³] between Normal & Probiotic Group using Mann Whitney U Test

Time	Groups	N	Mean	SD	Mean Diff	Mean Ranks	Z	P-Value
Baseline	Normal	8	145.00	43.43	-75.00	5.25	-1.713	0.09
	Probiotics	4	220.00	67.82		9		
After 1 Hr	Normal	8	133.63	40.15	47.00	11.13	-2.207	0.03*
	Probiotics	8	86.63	29.81		5.88		
After 7 Days	Normal	8	111.25	33.00	89.37	12.50	-3.376	0.001*
	Probiotics	8	21.88	13.87		4.50		

5. Discussion

Bacteriotherapy is a novel and promising concept for combating infections and preventing dental caries. Studies on probiotics were performed to validate the survival and positive effects of probiotic bacteria Bifidobacterium lactis Bb-12 within the human body, including immune response and gastrointestinal health in young children, but studies concerning probiotics and dental health are limited [8].

Since the late 1980s, a range of dairy products containing bifidobacteria have been marketed in a number of countries worldwide, and studies have been performed to validate the survival and positive effects of Bifidobacterium. Several studies suggest that consumption of products containing probiotic lactobacilli or bifidobacteria could reduce the

number of cariogenic micro-organisms in saliva [9]. The tendency toward a decreased number of cariogenic micro-organisms in the saliva seems to be independent of the product or strain used; however, such effect has not been observed in all studies [10]. Therefore, the study was done to estimate the effect of probiotic curd on salivary mitis streptococci. The product used for the study was well accepted by the participants, which was expected since curd eating is a life-long tradition followed in Northern Karnataka.

On comparing the mean salivary mitis streptococci at baseline, after 1 hour, and after 7 days of consumption of probiotic and normal curd, the results were found to be statistically significant after 1 hour (P ≤ 0.05) and after 7 days (P ≤ 0.05) period. This was in accordance with the study done

by Chinnappa et al [11] in which after 1 hour and 7 days, statistically significant ($P \leq 0.05$) results were obtained.

Significant reduction in salivary mitis streptococci ($P \leq 0.05$) was found in the study after consumption of probiotic curd, which was in accordance to the previous studies done by Bhalla et al [12], Caglar et al [9] and Zhu et al [13] in which a statistically significant reduction of salivary mutans streptococci was recorded after probiotic yogurt consumption ($P \leq 0.05$).

Singh et al [14] also reported that probiotic ice-cream brought about a statistically significant reduction in mutans streptococci count ($P \leq 0.05$). Similarly, Jindal et al [15] concluded that statistically significant reduction ($P < 0.05$) in salivary mutans streptococci counts was recorded after probiotic ingestion. Whereas the results were in contrast to the study done by Chuang et al [16] in which no differences in the counts of mutans streptococci between probiotic and control groups were found.

6. Conclusion

The findings of the present study revealed a significant reduction in the salivary mitis streptococci levels after 1 hour and 7 days of consumption of probiotic curd as compared to plain curd.

7. Limitations of the Study

The sample size taken was limited in the present study. In addition, salivary mitis streptococci in the saliva can only be regarded as an intermediate endpoint for caries. It remains to be investigated whether or not this really is beneficial for the patients.

8. Future Scope

Several health-promoting effects of probiotic bacteria are well documented and there is no reason to restrict the use of probiotic products because their effects on oral health are not yet well understood; however, their recommendation for dental health purposes is not yet justified.

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Author Profile



Dentistry.

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