Evaluation of the Efficacy of Commercial Mouthwashes in Sri Lanka Against a Major Cariogenic Bacterium

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Dental caries is the most common infectious disease in the oral cavity, affecting children and adolescents throughout their lives. *Streptococcus mutans* is known as the main etiological agent of dental caries due to its ability to form biofilm and promote tooth decay. Preventing its growth and biofilm formation is a crucial strategy in caries control. Among the various methods for maintaining oral hygiene, mouthwashes are commonly used as chemical adjuncts to mechanical plaque removal. Despite the widespread use of mouthwashes in Sri Lanka, there is limited data on their specific antibacterial activity against *S. mutans*. Hence, this study aimed to evaluate the antimicrobial activity of commonly used, commercially available mouthwashes in Sri Lanka. Antibacterial activity of 12 mouthwashes was evaluated using the disc diffusion method. Three batches of each were tested in triplicate against *S. mutans* (ATCC 700610). A 0.5 McFarland suspension was spread on Mueller-Hinton agar, and discs with mouthwash were applied. Plates were incubated anaerobically at 37°C for 24 hours, and inhibition zones were measured. Out of the mouthwashes analysed, seven (58%) demonstrated antibacterial activity, with the largest inhibition zone reaching 23.5 ± 3.6 mm. Compared to chlorhexidine-containing mouthwashes, two locally produced herbal mouthwashes with clove oil exhibited the strongest antibacterial effects, with inhibition zones of 23.5 ± 3.6 mm and 20.7 ± 2.5 mm. All four 0.2% chlorhexidine-based mouthwashes showed moderate activity, averaging 16 mm in diameter, while the smallest zone of inhibition (8.5 ± 0.6 mm) was seen in a formulation containing Povidone iodine. This study demonstrated that more than half of the tested mouthwashes exhibited antibacterial properties against *S. mutans*, likely due to their active ingredients. Interestingly, the strong antibacterial activity of clove oil-based, locally manufactured, herbal mouthwashes suggests that they could serve as effective natural alternatives to traditional chlorhexidine formulations in the prevention of dental caries.

Keywords: *S. mutans*, antibacterial effect, mouthwashes, caries prevention, disc diffusion assay