

Synergistic activity of chitosan with chlorhexidine and their antimicrobial effect on the oral microbial flora causing gingivitis in patients with poor oral hygiene.

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ABSTRACT

Gingivitis is a form of periodontal disease. Gingivitis is due to the long-term effects of plaque deposits which is a cause of tooth decay. Chlorhexidine a chemical antiseptic is majorly used for the treatment of gingivitis. It is effective on both Gram-positive and Gram-negative bacteria. Chlorhexidine is toxic in high concentrations, but is used safely in low concentrations in many products, such as mouthwash and it is observed to have several side effects. Chitosan is a linear polysaccharide composed of randomly distributed β -(1-4)-linked D-glucosamine and N-acetyl-D-glucosamine. It has a number of commercial and biomedical uses. Chitosan is produced commercially by de-acetylation of chitin, which is the structural element in the exoskeleton of crustaceans. Chitosan is antimicrobial against several pathogenic bacteria and fungi. Chitosan is non-toxic and has no observed side effects. Our study deals with the in vitro comparison of antimicrobial effect of chitosan and chlorhexidine and also their synergistic effect against oral microbial flora causing gingivitis. Plaque scrapings were obtained from patients with gingivitis and transported using thioglycolate broth. Specimen was incubated for one hour at 37 °C and inoculated onto sterile Brain heart infusion agar plates for lawn culture. Sterile filter paper discs incorporated with 10 μ l of 0.2% chlorhexidine (Group A), 0.5% chitosan (Group B), and their combination in 1:1 ratio (Group C). The plates were incubated overnight at 37 °C and the zone of inhibition of growth was measured. This method was carried out for samples from 40 patients and statistical analysis was done from the obtained results.

Average zone sizes were tabulated to be as follows:

Group A- Chlorhexidine- 15.93mm

Group B- Chitosan-18mm

Group C- Combination (1:1) - 21.93mm

It was observed that chitosan showed better inhibition than chlorhexidine. The combination of chitosan and chlorhexidine was observed to have a comparatively better inhibitory effect than the individual components thus proving the synergistic effect.

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