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The comparative effect of acidified sodium chlorite and chlorhexidine mouthrinses on plaque regrowth and salivary bacterial counts.

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Source

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Abstract

Acidified sodium chlorite (ASC) is recognised as a highly potent, broad spectrum antimicrobial system that has been successfully developed for uses in veterinary, food processing and medical device fields. The current studies aimed to investigate the persistence of antimicrobial action and plaque inhibitory properties of 3 ASC mouthrinses by comparison with positive control, chlorhexidine 0.12%, and placebo control, water, rinses. Both studies were randomised, double-blind, cross-over 5-cell designs balanced for carryover. The 1st study involved 15 healthy subjects who immediately before and at 30, 60, 180, 300 and 420 min after rinsing provided 2 ml saliva samples. The samples were immediately processed for total anaerobic bacterial counts recorded after 96 h incubation. Washout periods were a minimum of 3 days. The second study involved 20 healthy subjects who on day 1 of each study were rendered plaque free, suspended normal oral hygiene methods and commenced rinsing twice daily with the allocated rinse. On day 5, plaque was scored by index and area after disclosing with erythrosin. Washout periods were 2 1/2 days. The 3 ASC and chlorhexidine rinses produced similar reductions in salivary bacterial counts which remained significantly below the placebo control to 7 h. There were no significant differences between ASC and chlorhexidine rinses except at 30 and 60 min when significantly greater reductions were produced by 2 ASC rinses compared to the chlorhexidine rinse. Plaque indices and areas were considerably and significantly lower with the ASC and chlorhexidine rinses compared to the placebo rinse. There were no significant differences between plaque scores for the 3 ASC rinses and the chlorhexidine rinse, although for 2 ASC rinses plaque scores were lower than for the chlorhexidine rinse. The results indicate that the 3 ASC rinses have equivalent plaque inhibitory action to chlorhexidine as a rinse. Similar to chlorhexidine, the plaque inhibitory action of the rinses appears to be derived from a persistence of antimicrobial action in the mouth.

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Effects of a mouthwash with chlorine dioxide on oral malodor and salivary bacteria: a randomized placebo-controlled 7-day trial.

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Abstract

BACKGROUND: Previous research has shown the oxidizing properties and microbiological efficacies of chlorine dioxide (CI02). Its clinical efficacies on oral malodor have been evaluated and reported only in short duration trials, moreover, no clinical studies have investigated its microbiological efficacies on periodontal and malodorous bacteria. Thus, the aim of this study was to assess the inhibitory effects of a mouthwash containing CI02 used for 7 days on morning oral malodor and on salivary periodontal and malodorous bacteria.
METHODS/DESIGN: A randomized, double blind, crossover, placebo-controlled trial was conducted among 15 healthy male volunteers, who were divided into 2 groups. Subjects were instructed to rinse with the experimental mouthwash containing CI02 or the placebo mouthwash, without CI02, twice per day for 7 days. After a one week washout period, each group then used the opposite mouthwash for 7 days. At baseline and after 7 days, oral malodor was evaluated with Organoleptic measurement (OM), and analyzed the concentrations of hydrogen sulfide (H2S), methyl mercaptan (CH3SH) and dimethyl sulfide «CH3)2S), the main VSCs of human oral malodor, were assessed by gas chromatography (GC). Clinical outcome variables included plaque and gingival indices, and tongue coating index. The samples of saliva were micrObiologically investigated. Quantitative and qualitative analyses were performed using the polymerase chain reaction- Invader method.
RESULTS AND DISCUSSION: The baseline oral condition in healthy subjects in the 2 groups did not differ significantly. After rinsing with the mouthwash containing CI02 for 7 days, morning bad breath decreased as measured by the OM and reduced the concentrations of H2S, CH3SH and (CH3)2S measured by GC, were found. Moreover CI02 mouthwash used over a 7-day period appeared effective in reducing plaque, tongue coating accumulation and the counts of Fusobacterium nucleatum in saliva. Future research is needed to examine long-term effects, as well as effects on periodontal diseases and plaque accumulation in a well-defined sample of halitosis patients and broader population samples.
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Controlled clinical evaluations of chlorine dioxide, chlorite and chlorate in man.

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Abstract

To assess the relative safety of chronically administered chlorine water disinfectants in man, a controlled study was undertaken. The clinical evaluation was conducted in the three phases common to investigational drug studies. Phase I, a rising dose tolerance investigation, examined the acute effects of progressively increasing single doses of chlorine disinfectants to normal healthy adult male volunteers. Phase II considered the impact on normal subjects of daily ingestion of the disinfectants at a concentration of 5 *mg/l.* for twelve consecutive weeks. Persons with a low level of glucose-6- phosphate dehydrogenase may be expected to be especially susceptible to oxidative stress; therefore, in Phase III, chlorite at a concentration of 5 *mg/L* was administered daily for twelve consecutive weeks to a small group of potentially at-risk glucose-6-phosphate dehydrogenase-deficient subjects. Physiological impact was assessed by evaluation of a battery of qualitative and quantitative tests. The three phases of this controlled double-blind clinical evaluation of chlorine dioxide and its potential metabolites in human male volunteer subjects were completed uneventfully. There were no obvious undesirable clinical sequellae noted by any of the participating subjects or by the observing medical team. In several cases, statistically significant trends in certain biochemical or physiological parameters were associated with treatment; however, none of these trends was judged to have physiological consequence. One cannot rule out the possibility that, over a longer treatment period, these trends might indeed achieve proportions of clinical importance. However, by the absence of detrimental physiological responses within the limits of the study, the relative safety of oral ingestion of chlorine dioxide and its metabolites, chlorite and chlorate, was demonstrated.