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Effects of Chlorine Dioxide on Oral Hygiene - A Systematic Review and Meta-analysis

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Abstract

Background: Effective and selective oral rinses are required in the daily medical and dental practice. Currently mouthwashes used have substantial side effects.

Objectives: Our aim was to evaluate the efficacy of chlorine dioxide-containing mouthwashes in comparison with other previously established mouth rinses in healthy adults using oral hygiene indices.

Methods: This work was registered in PROSPERO (CRD42018099059) and carried out using multiple databases and reported according to the PRISMA statement. The search terms used were "chlorine dioxide" AND "oral", and only randomised controlled trials (RCTs) were included. The primary outcome was the alteration of the plaque index (PI), while the secondary outcomes were the gingival index (GI) and bacterial counts. For the risk of bias assessment, the Cochrane Risk of Bias Tool was used. Statistical analysis for data heterogeneity was performed by Q-value and I2-tests.

Results: 364 articles were found in the databases. After the selection process, only five RCTs were eligible for meta-analysis. Data heterogeneity was low. There were no statistical differences in effectiveness between chlorine dioxide and other effective mouth rinses in PI (0.720±0.119 vs 0.745±0.131; 95%; confidence intervals (CIs): 0.487-0.952 vs 0.489-1.001, respectively) and GI (0.712±0.130 vs 0.745±0.131; 95% CIs: 0.457-0.967 vs 0.489- 1.001, respectively) and also in bacterial counts.

Conclusion: Chlorine dioxide reduces both plaque and gingival indices and bacterial counts in the oral cavity similar to other routinely used oral rinses, however, the evidence supporting this outcome is very limited. Therefore, further large scale RCTs are needed to decrease the risk of bias.

Keywords: Chlorine dioxide; gingival index; meta-analysis; mouthwash; oral hygiene; plaque index; systematic review.
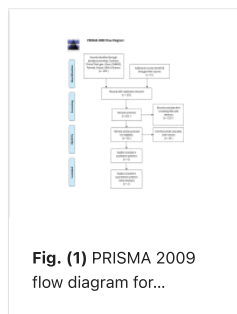
Figures

Fig. (1) PRISMA 2009 flow diagram for...

Fig. (2) Risk of Bias graph.
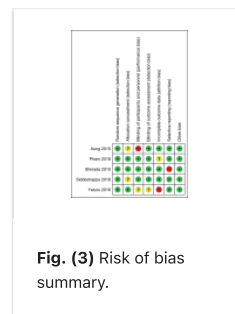

Fig. (3) Risk of bias summary.
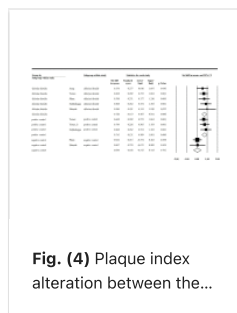

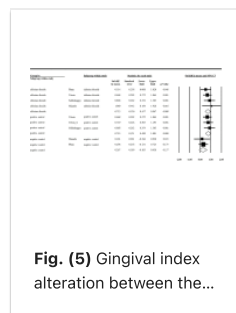**Fig. (4)** Plaque index alteration between the...

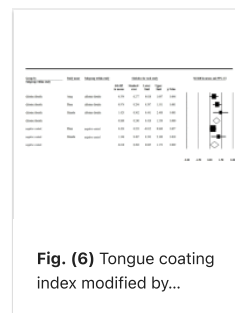**Fig. (5)** Gingival index alteration between the...

Fig. (6) Tongue coating index modified by...

All figures (8)

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