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study

Do omega-3 supplements improve clinical parameters after subgingival debridement?

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Background

The inflammatory host response is a key factor in the pathogenesis of periodontitis. Hence, control of inflammation appears to play a key role in the treatment of the disease.

The mechanical removal of the microbial biofilm by non-surgical periodontal therapy (NSPT) entails the elimination of the cause of the inflammation. However, administration of pharmacological agents as adjuncts to NSPT may facilitate resolution, in a process known as host modulatory therapy (HMT).

There is evidence that omega-3 polyunsaturated fatty acids (ω-3 fatty acids) are useful in controlling inflammation in several disease types. They are usually provided though nutrition: food intake (fish oil) and dietary supplementation.

ω-3 fatty acids are substrates for enzymatic conversion to a series of bioactive lipid mediators known as resolvins and protectins, which enhance the immune response by reducing neutrophil infiltration and increasing monocyte recruitment. Aspirin seems to increase this anti-inflammatory action.

The use of ω-3 fatty acids as dietary supplementation during NSPT is not included in the EFP's S3-level clinical practice guidelines on the treatment of periodontal diseases, because it is not fully clear how they might impact periodontal treatment outcomes.

Aim

To investigate the efficacy of ω-3 fatty acids as oral supplementation during NSPT in reducing the probing pocket depth (PDD) and increasing the clinical attachment level (CAL) in systemically healthy periodontitis patients.

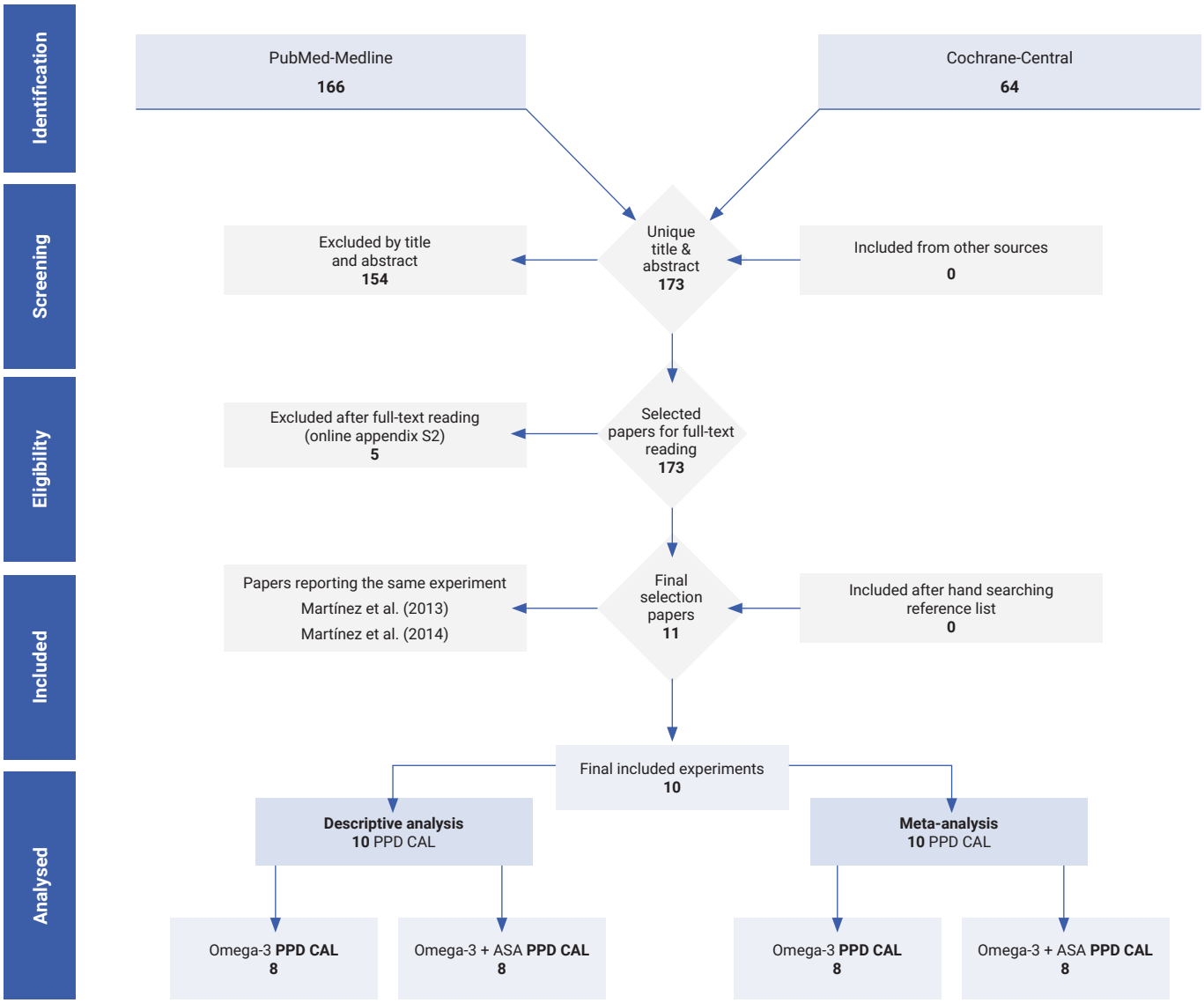
Materials & methods

- The authors conducted a systematic review of the literature to identify randomised clinical trials or controlled clinical trials that evaluated the effectiveness of ω-3 fatty acids as oral supplementation on PPD and CAL during NSPT, compared to placebo.
- Heterogeneity was assessed by study design, evaluation period, characteristics of subjects, side effects, and industry funding.

Results

- A total of 10 articles were included for descriptive analysis and meta-analysis: eight dealing with ω-3 fatty acids alone and two with the combination of ω-3 fatty acids and aspirin.
- Follow-up was recorded for one study at 12 months, four at six months, three at three months, and two studies had no follow-up period. The populations were reported as being healthy and only two studies included smokers.
- The supplementation with ω-3 fatty acids was not associated with any side effects.
- Seven studies could be included to evaluate the adjunctive efficacy of ω-3 fatty acids during non-surgical therapy on PPD. The data were statistically significant ($p < .05$) with an added 0.42mm PPD reduction in the test group.
- Six studies could be included to evaluate the adjunctive efficacy of ω-3 fatty acids during non-surgical therapy on CAL. The data were statistically significant ($p < .05$) with an added 0.42mm CAL gain in the test group.
- The analysis showed a significant mean difference in favour of the adjunctive use of ω-3 fatty acids during NSPT. However, heterogeneity was high for the end score: 93% for PPD and 83% for CAL.

Figure: Search and selection results



Limitations

- Variable follow-up duration.
- Two of the included studies did not have a placebo as a control.
- Differences in the host-modulator intake: some studies evaluated ω-3 fatty acids alone, other ω-3 fatty acids with aspirin. The ideal dosage for ω-3 fatty acids was unclear and varied between the studies.

Conclusions & impact

- The results of this systematic review and meta-analysis support the use of ω-3 fatty acids as oral supplementation adjunctively to NSPT.
- The additional effects are moderate, with a 0.42mm PPD reduction and a 0.42mm CAL gain.
- No conclusions could be drawn regarding the synergetic effect on periodontal health of combining aspirin with ω-3 fatty acids.
- These results are not in accordance with the recommendations in the EFP clinical practice guidelines. This can be explained by the study's use of more flexible inclusion criteria than were followed in the systematic review that was performed to establish the guidelines (Donos et al., 2020) – i.e., inclusion of studies without placebo control, with a follow-up period of less than six months, and with host-modulator intake in addition to ω-3 fatty acids.

JCP Digest 106 is a summary of 'The effect of omega-3 fatty acids on active periodontal therapy: a systematic review and meta-analysis' *J Clin Periodontol.* 49(10):1024-1037. DOI: 10.1111/jcpe13680

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