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A meta-analysis of the effect of dietary omega-3 fatty acid supplementation on walking speed and inflammatory markers in older healthy adults

Background: Frailty is a complex phenomenon, highly correlated with a reduction in mobility along with progressive loss of skeletal muscle strength, mass and function. Dietary supplementation of fish derived omega-3 polyunsaturated fatty acids (PUFAs), eicosapentaenoic acid and docosahexaenoic acid have shown to have a beneficial effect on skeletal muscle mass and strength. PUFAs are of particular interest in the context of frailty, given their well-known anti-inflammatory role and the consensus of an inflammatory contribution to frailty, with differences in the levels of pro-inflammatory cytokines between frail and non-frail elderly having been reported.

Objective: To examine the effect of dietary omega-3 supplementation on frailty traits and associated biomarkers in medically stable older adults.

Methods: A meta-analysis of randomised controlled trials studying omega-3 PUFA supplementation in older, medically stable people, published up to October 2017 was carried out in 5 databases. The results were pooled using a random-effects meta-analysis with standardised mean differences. This study has been registered with PROSPERO (registration number CRD42017080240).

Results: 13 studies met the inclusion/exclusion criteria but not all frailty traits or associated biomarkers were measured in all studies.

In 4 studies that analysed 236 patients, omega-3 fatty acid supplementation was associated with a significant improvement in walking speed with a pooled effect size of 0.28 (95% CI, 0.00, 0.55; P= 0.05).

A significant lowering effect was observed for C-reactive protein (CRP) levels in 5 trials of 310 patients with a pooled effect size of -0.62 (95% CI, -1.14, -0.10; P = 0.02).

The pooled effect sizes for the inflammatory cytokines TNF α (5 trials; n=168), was -0.36 (95% CI, -1.09, 0.36; P=0.33), and for IL-6 (5 trials; n= 187), was -0.08 (95% CI, -0.62, 0.47; P=0.78) and were not found to be significant.

Conclusion

These results suggest that dietary omega-3 supplementation may have a beneficial effect on medically stable older people by improving walking speed and reducing some markers of systemic chronic inflammation.