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Omega-3 Supplementation and Non-Alcoholic Fatty Liver Disease: A Systematic Review and Meta-Analysis

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Abstract

Non-alcoholic fatty liver disease (NAFLD) is a frequent accompaniment of obesity and insulin resistance. With the prevalence approaching 85% in obese populations, new therapeutic approaches to manage NAFLD are warranted. A systematic search of the literature was conducted for studies pertaining to the effect of omega-3 polyunsaturated fatty acid (PUFA) supplementation on NAFLD in humans. Primary outcome measures were liver fat and liver function tests: alanine aminotransferase (ALT) and aspartate aminotransferase [1]. Data were pooled and meta-analyses conducted using a random effects model. Nine eligible studies, involving 355 individuals given either omega-3 PUFA or control treatment were included. Beneficial changes in liver fat favoured PUFA treatment (effect size=-0.97, 95% CI: -0.58 to -1.35, p<0.001). A benefit of PUFA vs. control was also observed for AST (effect size=-0.97, 95% CI: -0.13 to -1.82, p=0.02). There was a trend towards favouring PUFA treatment on ALT but this was not significant (effect size=-0.56, 95% CI: -1.16 to 0.03, p=0.06). Sub-analyses of only randomised control trials (RCTs) showed a significant benefit for PUFA vs. control on liver fat (effect size=-0.96, 95% CI: -0.43 to -1.48, p<0.001), but not for ALT (p=0.74) or AST (p=0.28). There was significant heterogeneity between studies. The pooled data suggest that omega-3 PUFA supplementation may decrease liver fat, however, the optimal dose is currently not known. Well designed RCTs which quantify the magnitude of effect of omega-3 PUFA supplementation on liver fat are needed.

Comment in

The Optimal Dose of omega-3 Supplementation for Non-Alcoholic Fatty Liver Disease
Y Li et al. J Hepatol 57 (2), 468-9; author reply 469-70. Aug 2012. PMID 22433603.

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