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SHORT-TERM EFFECTS OF FISH OIL SUPPLEMENTATION ON HEART RATE VARIABILITY IN HUMANS: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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Objectives Effects of fish oil on heart rate variability, an index of autonomic function in humans, remain controversial. We performed a meta-analysis to investigate the influence of fish oil on parameters of heart rate variability.

Methods Human intervention studies were identified by systematic search of Medline, Embase, Cochrane's library and references of related reviews and studies through March 2012. Random-effect

model was applied to estimate the pooled results. Prespecified subgroup analyses were performed to explore the influence of study characteristics on the overall outcomes.

Results A total of 17 studies were reviewed. Meta-analysis results showed that SD of normal-to-normal interval (SMD=0.10, 95% CI -0.11 to 0.30, $p=0.35$) and root mean square of successive differences (SMD=0.05, 95% CI -0.18 to 0.27, $p=0.35$), two of the time domain parameters of heart rate variability, were not significantly influenced by fish oil supplementation. For frequency domain parameters, by fish oil supplementation, the high-frequency power, a surrogate of vagal function, was significantly increased (SMD=0.34, 95% CI 0.10 to 0.58, $p=0.005$), the low-frequency power was not significantly affected (SMD=0.00, 95% CI -0.24 to 0.24, $p=0.99$), and the ratio between the low and high-frequency power showed a trend of reduction (SMD=-0.22, 95% CI -0.47 to 0.03, $p=0.08$). Subgroup analyses according to predefined study characteristics, such as mean age, gender and healthy status of the participants, total dose and ratio between EPA and DHA, follow-up duration, β -blocker usage and Jadad scores, retrieved no significant results.

Conclusions Short-term fish oil supplementation may favourably influence the frequency domain parameters of heart rate variability, indicating enhancement of vagal tone may be an important mechanism underlying the antiarrhythmic effect of fish oil. Large scale clinical trials with adequate statistical power are needed to confirm these effects and their clinical relevance in the future.