

# Omega-3 fatty acid concentrate decreased triglycerides in coronary heart disease patients treated with simvastatin

*Abstracted from:* Durrington PN, Bhatnagar D, Mackness MI, Morgan J, Julier K, Khan MA, France M. An omega-3 polyunsaturated fatty acid concentrate administered for one year decreased triglycerides in simvastatin treated patients with coronary heart disease and persisting hypertriglyceridaemia. *Heart* 2001;85:544–548

**BACKGROUND** Used in conjunction with statins, omega-3 fatty acids may prolong survival after myocardial infarction and decrease serum triglyceride concentrations. However, evidence is limited.

**OBJECTIVE** To examine the triglyceride lowering capabilities, tolerability and safety of an omega-3 polyunsaturated fatty acid concentrate.

**DESIGN** Randomized controlled double-blind trial.

**SETTING** Two hospitals in Manchester, England; timeframe not specified.

**PARTICIPANTS** Fifty-nine consecutive established coronary heart disease patients with persisting hypertriglyceridaemia ( $> 2.3$  mmol/L) receiving 10–40 mg/day simvastatin; mean age 55 years (range 37–75); 73% male.

**INTERVENTION** 2 g placebo or omega-3 fatty acid concentrate twice daily for 24 weeks.

**OUTCOMES** Serum triglyceride level.

**MAIN RESULTS** Compared with the placebo group, those receiving omega-3 fatty acid concentrate had significantly decreased serum triglycerides and very low density lipoprotein cholesterol at 3, 6 and 12 months ( $P$  all  $< 0.005$ ). The concentrate was well tolerated and had no reported adverse effects on low-or high-density lipoprotein cholesterol, glycaemic control, or biochemical or haematological factors.

**AUTHORS' CONCLUSIONS** The proprietary omega-3 fatty acid concentrate tested (Omacor) may be safe and effective for lowering serum triglycerides for hyperlipidaemia coronary heart disease patients treated with simvastatin.

**NOTES** Sample size is small, and the study may be underpowered to detect adverse effects. The study does not report on clinical outcomes.

## Commentary

Recent prospective epidemiological studies show that plasma triglyceride metabolism should not be overlooked as a risk factor for coronary heart disease. A meta-analysis of 17 population-based prospective studies showed that elevated plasma triglyceride concentrations were an independent risk factor for coronary heart disease, whereby a 1 mmol/L increase in plasma triglyceride concentrations was associated with an increased cardiovascular risk of 32% in men and 76% in women.<sup>1</sup> The Physicians Heart Health Study showed that non-fasting serum triglyceride concentration was an independent predictor of future myocardial infarction.<sup>2</sup> Plasma triglyceride metabolism interacts with several risk factors for coronary heart disease and modulates the process of athero-thrombosis. Elevated triglyceride concentrations promote the formation of the highly atherogenic small, dense, low-density lipoproteins, reduce concentrations of the cardio-protective high-density lipoprotein fraction and promote the activation of coagulation factor VII.<sup>3</sup>

Fish oils are a rich source of omega-3 polyunsaturated fatty acids. They effectively reduce plasma triglyceride levels by

inhibiting hepatic triacylglycerol synthesis and very low-density lipoprotein production. The current study demonstrates that fish oil supplementation (4 g/d) significantly reduces serum triglyceride and very low-density lipoprotein cholesterol concentrations in hypertriglyceridaemic patients, already receiving simvastatin treatment. Whilst it is important to note that initial triacylglycerol concentrations were higher in the omega-3 treatment group, nevertheless serum triacylglycerol concentrations were significantly reduced when the control group received the omega-3 supplement in the latter part of the trial.

The results highlight the added benefit of omega-3 supplementation in patients already receiving simvastatin. Whilst this study focused on triglyceride metabolism, three other studies have shown that omega-3 polyunsaturated fatty acids supplementation alone reduced mortality rates in patients with coronary heart disease.<sup>4,5,6</sup> Hence it might be hypothesised that this combination treatment may be an effective cardio-protective therapy.

**Dr Helen M Roche**, BSc, MSc, PhD  
Trinity College, Dublin, Ireland

## Literature cited

1. Hokanson JE, Austin MA. Plasma triglyceride level is a risk factor for cardiovascular disease independent of high-density lipoprotein cholesterol level: a meta-analysis of population based prospective studies. *J Cardiovasc Risk* 1996; 3: 213–219
2. Stampfer MJ, Krauss RM, Ma J, et al. A prospective study of triglyceride level, low-density lipoprotein particle diameter, and risk of myocardial infarction. *JAMA* 1996; 276: 882–888
3. Roche HM, Gibney MJ. The impact of postprandial lipemia in accelerating atherothrombosis. *J Cardiovasc Risk* 2000; 7(5): 317–324.
4. Burr ML, Gilbert JF, Holliday RM, et al. Effects of changes in fat, fish and fibre intakes on death and myocardial reinfarction: diet and reinfarction trial (DART). *Lancet* 1989; ii: 757–761
5. De Lorgeril M, Salen P, Martin J-L, et al. Mediterranean diet, traditional risk factors, and the rate of cardiovascular complications after myocardial infarction: final report of the Lyon diet heart study. *Circulation* 1999; 99: 779–785
6. GISSI – Prevenzione Investigators. Dietary supplementation with n-3 polyunsaturated fatty acids and vitamin E after myocardial infarction: results of the GISSI-Prevenzione trial. *Lancet* 1999; 354: 447–455