Omega-3 fatty acids improve haemodynamic and haemorheologic parameters and lipid profiles in patients with cardiovascular diseases

We read the paper by Holm et al. [3] with great interest. It provides important information on a new possible indication of the administration of omega-3 fatty acids (n-3-FA). Their study concentrated on the haemodynamic effects (blood pressure and systemic vascular resistance), and on the changes in renal functions as well as the lipid profile in heart transplant patients. In about 60% of patients the aetiology of heart failure was coronary heart disease (CHD).

Besides studying haemodynamic effects, another important aspect could be the measurement of haemorheological parameters. These factors (i.e. fibrinogen level, plasma and whole blood viscosity, red blood cell aggregation and deformability) are known to be altered in different cardiovascular diseases, and are considered as risk factors of these diseases [2-3]. One of our previous studies even showed a correlation between these factors and the angiographic severity of CHD [4]. Studies by our group and others verified haemorheological changes in hypertension, as well as in renal diseases, such as IgA nephropathy [5,6]. The role of these factors can become especially important in the microcirculation of the different organs, where the capillary diameter can be smaller than that of the red blood cell (RBC), and therefore RBCs have to deform in order to pass through these narrow capillaries.

Previous studies showed that n-3-FA can improve cardiovascular health by various positive effects (e.g. lowering plasma lipid and fibrinogen levels, inhibiting platelet aggregation, decreasing plasma and whole blood viscosity, positive effects on endothelial function, inflammation, cytokines, and gene expression of adhesion molecules) in different clinical conditions [7-9].

In two of our studies we also investigated the haemodynamic and haemorheologic effects of n-3-FA in patients with ischaemic heart disease and hyperlipidaemia [10,11]. Altogether 40 patients were examined and treated with 10 capsules of Ameu (Omega Pharma, Berlin, Germany; 0.5 g salmon oil with 33% of n-3-FA) daily for 2 months. Besides routine laboratory parameters, haemorheological measurements (plasma fibrinogen, plasma and whole blood viscosity) were carried out as well as an exercise stress test with non-invasive haemodynamic control (cardiac output, cardiac index, total peripheral resistance) by impedance-cardiography which was performed at baseline and after 2 months of treatment in the second study.

Triglycerides decreased significantly (P<0.01), while cholesterol and HDL levels did not change significantly. Plasma viscosity and fibrinogen levels showed a slight, but significant decrease after the treatment (P<0.05), and whole blood viscosity also decreased significantly at all measured shear rates (P<0.05). Total peripheral resistance decreased (P<0.01), while the cardiac index (both at rest and at peak exercise) showed an increase (P<0.05), along with exercise capacity which also increased significantly (P<0.01).

Our results, in concordance with the findings of the authors, show that this preparation can be useful in clinical practice because it has a beneficial effect not only on plasma lipids, but also on haemodynamic and haemorheological parameters. Based on these data we can speculate that in the protective effect of n-3-FA observed in heart transplant patients during their study, the improvement in haemorheological parameters might also play a role. For a better understanding of these beneficial effects, the authors could widen their study, and in the future investigate not only haemodynamic, but also haemorheologic and other relevant parameters.

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References


Hormone treatment — misconceptions and agreements

As representatives of the HERS trial, we are responding to your Hotline Editorial on hormone treatment [1] in order to address several misconceptions and comment on some areas of agreement.

Your editorial noted that the estimates of coronary heart disease event rate, follow-up duration, and crossover in randomized treatment that we used in the power calculation turned

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