Erythrocyte and plasma fatty acid profiles in patients with epilepsy: does carbamazepine affect omega-3 fatty acid concentrations?

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Fatty acids (FAs) determine membrane properties and may affect cardiac and neuronal function. In this study, FA profiles were determined in 56 patients with epilepsy who participated in a 12-week double-blind randomized trial of omega-3 FA supplementation (1 g eicosapentaenoic acid and 0.7 g docosahexaenoic acid daily). At baseline, subjects on carbamazepine (CBZ) had lower docosahexaenoic acid levels, lower levels of long-chain omega-3 FAs, and a lower Omega-3 Index (a risk factor for coronary heart disease mortality), whereas those on oxcarbazepine had higher total polyunsaturated FAs and a higher Omega-3 Index. Following omega-3 FA supplementation, the Omega-3 Index, eicosapentaenoic acid, and docosahexaenoic acid concentrations significantly increased. Patients on CBZ exhibited a less favorable FA profile, associated with a greater risk of coronary heart disease mortality. As arrhythmias are thought to be an important mechanism in coronary heart disease mortality and sudden unexplained death in epilepsy (SUDEP), the effect of CBZ effect in reducing omega-3 FAs might potentially explain some cases of SUDEP among patients prescribed CBZ.