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## The omega-3 fatty acid eicosapentaenoic acid (EPA) is inversely associated with ischemic brain infarcts in elderly patients with atrial fibrillation

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**Background:** The association of individual omega-3 fatty acids (n-3 FAs) with ischemic stroke remains unclear. Experimental data strongly suggest that n-3 FAs reduce ischemic stroke due to their anti-thrombotic and anti-inflammatory properties. Yet, recent clinical trials yielded mixed results. While marine n-3 FA supplementation (1g/day) did not reduce stroke, icosapent ethyl, a purified eicosapentaenoic acid (EPA) ethyl ester (4g/day), significantly reduced stroke incidence in patients at high cardiovascular risk. In the current study, we examined the association of fish-derived EPA, docosapentaenoic acid (DPA), docosahexaenoic acid (DHA) and the plant-derived alpha-linolenic acid (ALA) with the prevalence of ischemic brain infarcts in elderly patients with atrial fibrillation.

**Methods:** In this cross-sectional analysis of the Swiss atrial fibrillation (swissAF) cohort study, we determined baseline whole blood n-3 FAs by gas chromatography according to the HS-Omega-3 Index methodology in 1665 patients aged  $\geq$ 65 years with atrial fibrillation. Large non-cortical and cortical infarcts (LNCCI) were assessed by brain MRI. Total and individual n-3 FAs were correlated with the prevalence of LNCCI in a logit model with continuous factors. Analyses were adjusted for sex, age, body mass in-

dex, smoking, alcohol intake, family history of cardiovascular disease and atrial fibrillation, physical activity, hypertension, diabetes, chronic kidney disease, prior stroke, prior transient ischemic attack, aspirin, anticoagulation and type of atrial fibrillation.

**Results:** A total of 373 patients with LNCCI (22.4%) were identified. After adjustment, lower risk of LNCCI was associated with higher EPA (odds ratio [OR] 0.50 per increase of one percentage point EPA, 95% confidence interval [CI] 0.28–0.88) and a higher risk was detected with DPA (OR 2.39, 95% CI 1.43–4.01). No statistically significant association was detected with DHA (OR 1.13, 95% CI 0.94–1.35), ALA (OR 0.83, 95% CI 0.23–2.95) or total n-3 FAs (OR 1.03, 95% CI 0.92–1.16).

**Conclusions:** Higher levels of EPA are associated with a lower prevalence of ischemic infarcts in aged patients with atrial fibrillation. Unexpectedly, DPA shows a direct correlation with ischemic infarcts. This study demonstrates that individual n-3 FAs may differentially affect stroke risk and that supplementation of EPA may be an interesting strategy to prevent ischemic stroke in atrial fibrillation patients.