

Can depression and suicide risk of pilots be predicted by lab tests? - Cognition, major Depression and Status in Omega-3 Fatty Acids

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In large parts, brain consists of fat; up to 70% in some parts, this fat is the marine omega-3 fatty acid docosahexaenoic acid (DHA). Eicosapentaenoic acid (EPA), another marine omega-3 fatty acid plays a role in regulating the brain's blood circulation. Inflammatory reactions and their resolution can be observed in the brains of patients with major depression; both are modulated by EPA and DHA. Neither EPA nor DHA can be synthesized in the human body in sufficient amounts, and therefore have to be ingested. The status of a person in EPA and DHA, even in brain, can be assessed with the HS-Omega-3 Index[®], a standardized method for fatty analysis of erythrocytes. Currently, 153 publications in international journals and some 50 ongoing research projects are based on the HS-Omega-3 Index. For the HS-Omega-3 Index, a target range between 8 and 11% has been suggested. According to our measurements, levels the HS-Omega-3 Index decrease over time, probably reflecting the disappearance of sources of EPA+DHA in our diets. Currently, some 75% of our measurements are below the target range. Disability-adjusted life years lost due to major depression are increasing, as are cognitive impairments.

Complex cognitive functions, like executive function, reaction time, abstract thinking, aspects of memory and others correlate with the HS-Omega-3 Index in all age groups investigated. In healthy individuals, and in all age groups, the functions mentioned were improved in randomized, controlled double-blind intervention trials with EPA+DHA, which was confirmed by pertinent meta-analyses. If measured, improvements correlated with the increase of omega-3 fatty acids in the erythrocyte membrane.

Patients with major depression have a low HS-Omega-3 Index. Risk for suicide depends on the proportion of DHA in the erythrocyte membrane. In a number of randomized, controlled, double-blind intervention trials with EPA+DHA, major depression was improved, again confirmed by pertinent meta-analyses.

Taken together, a low HS-Omega-3 Index identifies individuals with risk for impairments of complex cognitive functions, and risk for depression and suicide. Increasing the HS-Omega-3 Index by increased intake of EPA+DHA improves complex cognitive functions and major depression.