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N-3 FATTY ACID SUPPLEMENTATION INFLUENCES MEMBRANE FATTY ACIDS AND PHOSPHOLIPASE A_2 ACTIVITY IN PATIENTS AT RISK TO DEVELOP PSYCHOSIS

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Introduction: Decreased levels of polyunsaturated membrane fatty acids (PUFA) and increased activity of cytosolic phospholipase A_2 (PLA_2) enzymes (key regulating enzymes of membrane remodelling and PUFA availability) are supporting pillars of the “membrane phospholipids concept of schizophrenia”. Assuming that membrane PUFA profile and PLA_2 activity are altered during the at risk phase of disorder and influenced by fatty acid supplementation, we investigated PUFA profiles and PLA_2 activity simultaneously in ultra high-risk (UHR) subjects before and after (n-3) fatty acids supplementation.

Method: In 81 UHR patients (aged between 13 and 25 years) PUFA levels were assessed in erythrocyte membranes using gas chromatography, and cytosolic PLA_2 activity was measured in blood serum using a fluorometric HPTLC-based assay. Measurements were performed before and after a 6 month interval of placebo-controlled supplementation with n-3 fatty acids.

Results: At baseline significant associations were found between (n-9) and (n-6)-PUFA levels and psychopathology (especially in negative symptoms) assessed by the PANSS according to PACE criteria. (n-3)-PUFA supplementation caused significant changes in (n-3)- and (n-6)-PUFA levels and a significant decrease of PLA_2 activity.

Conclusion: Our results support associations between membrane biochemistry and psychopathology (especially negative symptoms) in people at risk to develop psychosis. Supplementation of n-3 PUFA increases PUFA availability at membrane level and modulates membrane repair and remodelling processes. Assuming that PLA_2 activity reflects neuronal damage, PUFA supplementation might unfold neuroprotective effects.

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