

Omega 3 fatty acid levels in multiple sclerosis: correlation of diet, disability, and depression

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Objective: To examine red blood cell (RBC) and dietary fatty acids in patients with relapsing-remitting MS in order to 1) compare with healthy controls and 2) examine relationships with disability and depression.

Background: Epidemiological studies have documented a relationship of polyunsaturated fatty acids (PUFAs) to the prevalence of MS. Patients have been shown to have lower levels of n-3 and n-6 PUFAs in cerebrospinal fluid, plasma, and RBCs. However, only one study has also examined dietary intake of fatty acids in MS. Furthermore, few studies have examined RBC fatty acids in relation to disability, and none in relation to depression in MS. In addition to replicating previous findings regarding fatty acids in MS, the present study examines dietary fatty acid intake as well as the relationship of fatty acids to disability and depression.

Methods: 38 patients with relapsing-remitting MS (32 female, 6 male) were compared with 34 healthy controls (27 female, 6 male). All subjects provided a blood sample and completed the Chicago Multiscale Depression Inventory (CMDI) and a 3-day food record. The Guy's Neurological Disability Scale (GNDS) and the Kurtzke Expanded Disability Status Scale (EDSS) were completed on all MS patients. RBC fatty acids were analyzed using gas liquid chromatography and dietary intake was calculated using the Nutrition Data System for Research.

Results: **MS patients had significantly lower levels of RBC total n-3 fatty acids, DHA, and EPA, compared to controls. No differences were found in n-6 or total saturated fatty acids.** However, myristic and oleic acid were increased in the RBCs of MS patients. No significant differences between patients and controls were found in dietary fatty acids. Although MS patients had higher CMDI scores than controls, no relationship was found between RBC fatty acids and depression. Likewise, none of the RBC fatty acids was related to disability.

Conclusion: The abnormalities in RBC fatty acids in this study are consistent with previous research. **Because dietary fatty acid intake did not differ between patients and controls, this study provides evidence that RBC fatty acid differences observed in MS are due primarily to metabolic as opposed to dietary factors.** Because no correlation was found between RBC fatty acids and either disability level or depression, uncertainty remains as to the clinical significance of these fatty acid differences.