Effect of omega-3 fatty acids on lipid peroxidation and antioxidant enzyme status in type 2 diabetic patients.

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BACKGROUND: This study was conducted to investigate the effect of omega-3 fatty acids on lipid peroxidation and antioxidant enzyme activities in non-insulin dependent diabetic patients.

METHODS: Thirty-four non-insulin dependent diabetic patients were selected for this study and they were initially treated with antidiabetic drugs alone for one month. This was followed by supplementation with omega-3 fatty acids (1,080 mg of EPA and 720 mg of DHA per day) along with the antidiabetic drugs for a period of two months.

RESULTS: No change in glycaemic control was observed in diabetic patients at the end of two months of omega-3 fatty acids therapy along with antidiabetic drugs. The combined treatment significantly reduced serum triglycerides (2.07 +/- 0.94 mmol/l, before combined therapy vs 1.54 +/- 0.49 mmol/l after combined therapy, P<0.05) and increased HDL-cholesterol levels (0.93 +/- 0.099 mmol/l, before combined therapy vs 1.04 +/- 0.098 mmol/l after therapy, P<0.001). The raised lipid peroxide levels (5.14 +/- 0.61 micromol MDA/l in controls vs 6.36 +/- 1.56 micromol MDA/l in diabetic patients, P<0.001) were significantly decreased in these patients after the combined therapy (6.36 +/- 1.56 micromol MDA/l, before combined therapy vs 5.16 +/- 0.7 micromol MDA/l, after combined therapy, P<0.01). Among the erythrocyte antioxidant enzymes, the Glutathione peroxidase activity was increased (32.5 +/- 9.9 U/g Hb/min, before combined therapy vs 42.25 +/- 4.6 U/g Hb/min, after combined therapy, P<0.01) while no change was observed in Catalase (99.7 +/- 30.4 KU/g Hb before combined therapy vs 85.35 +/- 23.41 KU/g Hb, after combined therapy) and Superoxide dismutase activities (2.6 +/- 1.04 U/mg Hb/min, before therapy vs 3.01 +/- 1.08 U/mg Hb/min, after combined therapy) after the 2 months of combined treatment with antidiabetic agents and omega-3 fatty acids.

CONCLUSION: Supplementation with omega-3 fatty acids has beneficial effects on serum triglycerides, HDL-cholesterol, lipid peroxidation and antioxidant enzymes, which may lead to decreased rate of occurrence of vascular complications in diabetes.