

The effect of dietary fish oil on metabolic risk markers in overweight teenage boys

by

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Objective: It is generally agreed that fish oil has beneficial cardiovascular effects, but its effect on development of type 2 diabetes is not determined. We hypothesized that intake of long-chain n-3 polyunsaturated fatty acid (n-3 LCPUFA) may have more profound effects during growth and development. Therefore, we investigated the effect of fish oil on glucose tolerance, blood pressure and blood lipid profile in teenage boys.

Methods: Seventy-eight 13-15 year-old boys with a mean whole body fat percentage of 29.8 ± 8.6 % were randomized to a fish oil-group or a control group (a mixture of typical vegetable oils). The supplement oils added to bread and supplied a daily amount of 1.5 g of n-3 LCPUFA for the fish oil group. Glucose tolerance, Hb1Ac-glycosylation, blood pressure, plasma lipid profile, and erythrocyte fatty acid composition were determined at baseline and after 16 weeks of intervention.

Results: During the intervention the average vertical growth rate was ~6 cm/year and the corresponding weight gain was 6.6 kg/year on average. Erythrocyte content of EPA and DHA increased 173 and 95 % respectively in the fish oil group compared to an increase of 12 and 10 % in the control group. Fish oil caused a significant reduction in blood pressure with a group difference of 3.7 and 3.6 mmHg for systolic and diastolic blood pressure respectively. No markers of glucose control were altered by the intervention. Plasma TAG concentration was also unaffected by the treatments, but total cholesterol and HDL cholesterol significantly increased in the fish oil group. The changes in erythrocyte EPA content correlated negatively with both systolic and diastolic blood pressure and positively with total and HDL cholesterol.

Conclusion: The results indicate that a daily supplement of fish oil for 16 weeks decreased blood pressure but also caused an increase in total and HDL cholesterol.

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