

A Lipid Lowering Diet Rich in Monounsaturated Rapeseed Oil Reduces the Serum Lipoprotein Cholesterol Concentration and Increases the Relative Content of N-3 Fatty Acids in Serum in Hyperlipidaemic Subjects

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Studies on the effects of diets rich in monounsaturated fat have shown beneficial effects on the serum lipoprotein profile of the same degree as that of diets containing polyunsaturated fat. The monounsaturated fat used in these studies have mainly been olive oil. Rapeseed oil is also high in monounsaturated fat. Furthermore, rapeseed oil has a higher content of linoleic (18:2 n-6) and linolenic (18:3 n-3) acids and of tocopherol than the olive oil. The effects of inclusion of fats based on rapeseed oil in a lipid lowering diet are relatively unknown. The aims of the study were therefore to compare the effects of a diet rich in monounsaturated rapeseed oil with a diet containing polyunsaturated sunflower oil within a given frame of 30 energy% (E%) of total fat in a lipid lowering diet. The effects on lipoprotein, glucose and fatty acid metabolism as well as on plasma fibrinogen and tocopherol concentrations were evaluated in subjects with moderate hyperlipoproteinaemia.

METHODS 95 subjects with hyperlipoproteinaemia were randomized to treatment with a lipid lowering diet during three weeks in one of two parallel groups. The diets contained the same amount of total fat, protein, carbohydrates and dietary fibre and differed only with regard to fat quality. The fat used for cooking and as spread on the bread was based on either rapeseed oil (RO diet) or sunflower oil (SO diet). The diets were prepared at a special kitchen in the hospital. The subjects got all the food from the hospital kitchen besides a small amount of food from a free list of non-fat food to a maximum of 200 kcal (840 kJ). The diets were planned to contain 30 energy% of fat. The content of saturated, monounsaturated and polyunsaturated fat was 7.2, 14.0 and 6.5 E% and 7.6, 9.6 and 10.5 E% in the RO and SO diets, respectively.

RESULTS The concentrations of total serum, LDL and HDL cholesterol decreased significantly ($p < 0.001$) by 15%, 16% and 11% respectively on the RO diet, while the corresponding figures on the SO diet were 16%, 14% and 13% respectively. The ratio between LDL and HDL cholesterol decreased by 6% on the RO diet ($p < 0.05$). The concentration of serum triglycerides decreased by 14% ($p < 0.01$) on the RO diet and by 29% ($p < 0.001$) on the SO diet. A significant increase of n-3 fatty acids (20:5 n-3 and 22:5 n-3) was observed on the RO diet, while there was a decrease on the SO diet. Significant differences between the diets were the triglyceride decrease on the SO diet and the changes in the fatty acid composition of the serum phospholipids.

CONCLUSION Monounsaturated rapeseed oil based dietary fat in a lipid lowering diet has favourable effects on the lipid profile and on the composition of the fatty acids of the phospholipids in patients with hyperlipoproteinaemia. The effects of the diet rich in rapeseed oil on serum lipoprotein lipid concentrations were similar to those of the sunflower oil diet except for a slightly more pronounced reduction of the serum triglyceride concentrations on the sunflower oil diet. The enrichment of long-chain n-3 fatty acids in the serum phospholipids seen after the rapeseed oil diet corresponded to a significant reduction of long-chain n-3 fatty acids after the sunflower oil diet.