OXIDATION OF LOW DENSITY LIPOPROTEINS IN RENAL TRANSPLANT PATIENTS: EFFECT OF DIETARY ALTERATION

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Cardiovascular disease (CVD) is the major cause of death in renal patients whose risk is substantially increased compared to age-matched individuals from the general population (USRDS 1991). The risk of CVD remains high after renal transplant (Kasiske 1988). The factors responsible are not well delineated, but many patients have lipid abnormalities. Oxidation modification of low density lipoprotein (LDL) is also postulated as a possible important factor in the development of atherosclerosis (Richard et al. 1991). In healthy subjects and hyperlipidaemic subjects, dietary alteration has been shown to alter the susceptibility of LDL to oxidative modification (Corboy et al. 1993; Abbey et al. 1993). This study investigates the effect of alteration in dietary fat on lipids and LDL oxidation in a group of renal transplant patients.

Seven patients who had undergone a renal transplant at least six months previously and who had normal or mildly impaired renal function (plasma creatinine 80-180 μmol/l) were recruited into a dietary study to assess the effect of increasing the amount of monounsaturated fatty acids (MUFA) in their diet. After baseline blood sampling, the patients entered a control period or a MUFA diet period for one month each. During the control period they consumed their usual diet. During the MUFA diet they consumed a cereal containing MUFA and used rapeseed margarine and oil as a replacement for their usual spread and cooking fat. The subjects completed a seven-day diet record between weeks three and four. Venous blood specimens were taken at the end of each period for the measurement of plasma cholesterol, LDL and HDL cholesterol, triglycerides, TBARS, conjugated dienes (lag time, rate and maximum production).

Dietary analysis showed a significant increase in fat content on the MUFA diet — the mean (SD) MUFA intake being 25(6)g and 39(8)g on the control and MUFA diet respectively, and a decrease in carbohydrate intake (particularly of sugars). Polyunsaturated fatty acid intake increased slightly and saturated fatty acids remained constant. The other components of the diet were not significantly different. Body weight remained stable. Plasma LDL cholesterol was significantly lower on the MUFA diet ($P<0.01$), and the % free cholesterol was significantly increased and the % cholesterol esters significantly less. TBARS were not significantly different. The lag time of conjugated diene formation was significantly increased on the MUFA diet: mean (SD) 87 (12) mins vs. 72 (8) mins ($P<0.05$) on the usual diet and the rate of diene formation was much less ($P<0.001$).

Given the high CHD risk of renal transplant patients, a reduction in susceptibility of their LDL to oxidation, resulting from an increase in MUFA in the diet, may be beneficial and should be further explored.

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