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Effect of a 5 d intake of inulin on post-prandial remodelling of lipoproteins

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The aim of the present work was to determine whether the consumption of a soluble fibre such as inulin may influence lipoprotein remodelling in both the fasting and postprandial states in healthy volunteers.

The study was a cross-over design involving seventeen healthy male subjects who consumed a 500 ml coffee drink containing 10 g sugar and 5 g inulin or 10 g sugar only (placebo) during two random sequences of five consecutive days. On the fifth day, after a 12 h fasting period, the consumption of the coffee drink was followed by the consumption of a standard meal containing 35.2 g lipid, 89.6 g carbohydrate and 5.6 g protein. Samples were obtained on day 5 before the meal and at 30, 60, 120, 240 and 480 min after consumption of the meal. At each sampling time LDL and HDL size was determined by PAGE and lipoproteins were separated by ultracentrifugation for measurement of lipids and apo AI, B, CII, CIII and E.

As shown by the results obtained at day 5 in the fasting state, the only effect of the consumption of 5 g inulin/d was a decrease in HDL-apo CIII and HDL-apo E (for inulin *v.* placebo: apo CIII (mg/l) 41.9 (SD 16.0) *v.* 52.1 (SD 13.8), $P=0.006$; apo E (mg/l) 11.6 (SD 6.6) *v.* 14.5 (SD 5.7), $P=0.05$). In the postprandial state inulin had a decreasing effect on the changes in LDL-apo B and HDL-apo E (for inulin *v.* placebo: treatment effect $P=0.0052$ and $P=0.0264$; mean area under the curve (AUC) -12.6 *v.* $+4.6$ and $+26.4$ *v.* $+74.3$ for LDL-apo B and HDL-apo E respectively). There was also an increasing effect on the changes in HDL-phospholipids (for inulin *v.* placebo: treatment effect $P=0.0471$, mean AUC $+1.5$ *v.* -19.2). Changes in HDL composition were accompanied by an increasing effect on small-size HDL expressed as cholesterol mass (for inulin *v.* placebo: treatment effect $P=0.0078$, mean AUC 7.8 *v.* 4.2).

Diet intervention may modulate the remodelling of lipoproteins, which would argue in favour of more detailed studies of lipoprotein composition during clinical trials in nutrition. The effect of inulin on HDL size and composition during the postprandial state should be further investigated, particularly in relation to the role of apo E-rich small HDL in the first steps of cholesterol reverse transport.

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