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Impact of the amount and type of fat and carbohydrate on serum lipids in the RISCK study

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RISCK is a multi-centre randomised controlled dietary intervention in subjects at increased risk of metabolic syndrome that compares the effects of diets with a reduced SFA content that vary according to total fat, MUFA content and glycaemia index (GI)[(1)]. The results are reported for changes in serum lipids among the participants who completed the 6-month dietary intervention[(2)] Baseline serum lipid measurements were undertaken for all subjects, subsequently all subjects followed a high-SFA (HS) diet for 1 month, after which period a further set of lipid measurements were completed. The mean serum cholesterol concentration (mmol/l) was 5.59 (SD 0.94) at screening and 5.61 (SD 0.97) at the end of the run-in period. The subjects were then randomized to one of five dietary interventions for a 6-month period: an HS–high-GI (HGI) similar to the run-in diet or one of four isoenergetic interventions (high-MUFA (HM)–HGI; HM–low-GI (LGI); low-fat (LF)–HGI; LF–LGI). The target intake for total fat was 38% energy (%E) in the HS and HM diets and 28%E in the LF diets. The HM and LF diets were designed to reduce dietary SFA to 10%E with a planned MUFA intake of 18%E in the HM diets. The target GI differential between the HGI and LGI groups was approximately 12 points. Serum lipid concentrations were determined in a single laboratory following run-in and at the end of the intervention.

Table. Mean change in serum lipids (mmol/l)*

	HS–HGI (*n* 83)		HM–HGI (*n* 109)		HM–LGI (*n* 114)		LF–HGI (*n* 112)		LF–LGI (*n* 120)		
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	*P*
Total C	−1.2	−3.1, 0.6	−3.9	−5.7, −2.1	−7.0	−8.9, −5.0	−5.7	−7.4, −4.0	−6.7	−8.5, −4.8	0.0006
LDL-C	−0.6	−3.4, 2.1	−5.2	−7.8, −2.6	−7.8	−10.2, −5.5	−7.0	−9.2, −4.8	−7.0	−9.5, −4.5	0.0015
HDL-C	−2.0	−4.3, 0.3	−2.7	−4.6, −0.9	−4.3	−6.3, −2.2	−5.9	−7.7, −4.0	−7.2	−8.9, −5.5	0.0009
TAG	−0.6	−7.1, 6.3	1.5	−3.7, 7.0	−4.8	−9.6, 0.2	2.9	−2.0, 8.0	0.3	−4.4, 5.2	0.31
Total C:HDL-C	0.6	−1.5, 2.8	−2.4	−4.3, −0.5	−2.8	−4.7, −0.9	0.1	−1.7, 2.0	0.8	−1.1, 2.8	0.0033

C, cholesterol. *Mean change calculated on a square root transformed scale, but expressed as percentage change from the median value at the run-in visit. Outliers were first removed. *P* value is from ANCOVA of follow-up measure *v*. run-in visit adjusted for gender, centre, ethnicity and baseline waist, age and change in weight.

The results confirm that diets with a decreased SFA content reduce total cholesterol and LDL-cholesterol. A novel finding of the present study is evidence to suggest that reductions in the GI of the diet were associated with greater reductions in total cholesterol ($P = 0.011$) and LDL-cholesterol ($P = 0.028$). Importantly, NSP intake did not differ significantly between the HGI (HM–HGI and LF–HGI) and LGI groups (HM–LGI and LF–LGI) suggesting that the effect of GI is independent of the effects of dietary fibre. In the present study the most favourable change in total cholesterol:HDL-cholesterol was noted for the HM–LGI diet. The finding in the present study is in agreement with that of a recent meta-analysis[(3)] but indicates that a reduction in GI also contributes independently to a reduction in total cholesterol and LDL-cholesterol.

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