

Effect of high amylose starch and oat bran on metabolic variables and bowel function in subjects with hypertriglyceridemia

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Hypertriglyceridaemia is one of the hallmarks of the metabolic syndrome in which abdominal obesity, glucose intolerance and hyperinsulinaemia all serve to increase the risk of cardiovascular disease (1). High carbohydrate high fibre diets have been recommended in the management of elevated triglycerides although the evidence for benefit is inconclusive.

We evaluated the effects of three high carbohydrate diets (>55% energy) in 23 hypertriglyceridemic subjects who were overweight and had abdominal adiposity. Approximately 25% of the carbohydrate in each diet comprised either: (i) high amylose starch (50-75 g) (ii) low amylose starch (low fibre control) (iii) oat bran (90-120 g) incorporated into foods. Each diet was taken for four weeks and in a random cross-over design.

Plasma triglycerides were significantly lower on oat bran relative to the other two diets ($P<0.02$). No other effects on fasting plasma lipids, glucose or insulin was noted. However, when the high amylose starch comprised 33% of the carbohydrate in a test meal, it significantly reduced the overall post-prandial plasma insulin level by 17% relative to the low amylose diet ($P<0.01$).

Both oat bran and the high amylose diet resulted in an increased frequency of bowel actions and lower faecal pH ($P<0.02$) relative to the low amylose diet. However, unlike oat bran, the high amylose diet increased faecal butyrate concentrations in faecal water by 32% ($P<0.001$).

We conclude that in hypertriglyceridemic subjects, fibre from high amylose starch has no effect on plasma lipids relative to a low amylose starch, but when eaten as 33% of the carbohydrate in a test meal, high amylose starch significantly reduced post-prandial plasma insulin. In contrast, oat bran appears to prevent the rise in plasma triglyceride on a high carbohydrate diet in these subjects, whilst no effect on LDL cholesterol was observed. Dietary fibre from both oat bran and high amylose starch are equally effective in improving bowel function relative to a low fibre diet whereas high amylose starch may have additional benefits in creating a colonic environment which may lower colon cancer risk.

1. Reaven GM. Banting Lecture 1988: Role of insulin resistance in human disease. *Diabetes* 1988;37:1595-607.