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Acute effects of exercise on postprandial chylomicron metabolism

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Background - In addition to the benefits of chronic exercise on cardiovascular disease risk factors it appears that acute exercise may also confer similar benefits. It has been reported that on the day following 90 minutes of moderate cardiorespiratory endurance exercise, fasting and postprandial triglyceride levels are reduced in response to an oral fat load. However the effects of such exercise on fasting and postprandial chylomicron levels are unknown.

Objective - To determine whether a single bout of moderate intensity exercise reduces fasting and postprandial chylomicron levels.

Design - Randomised crossover study of lean healthy subjects (age 29.8 ± 2.0 yr (mean \pm SEM)) to compare fasting and postprandial measures on the day following 90 min of moderate (Borg Scale 12-14) intensity exercise to that observed following control (no exercise). On the day following either exercise or no exercise (control) a high fat mixed meal was administered. Fasting and postprandial triglyceride, apo B48 (marker of chylomicron particles), glucose, insulin, non-esterified fatty acids (NEFA) and fasting cholesterol (total, HDL and LDL) were measured.

Outcomes - Fasting and postprandial triglyceride levels were reduced following exercise by 16% and 41% respectively, however the reduction in postprandial levels did not reach significance ($P = 0.053$). The fasting and postprandial concentration of chylomicron particles however was not affected by a single bout of prior exercise.

Conclusions - A single bout of moderate intensity exercise reduces fasting triglyceride levels; however chylomicron levels are not similarly reduced. As the reduction in postprandial triglyceride levels was primarily due to reduced fasting levels it is likely that exercise leads to a reduction in hepatic VLDL secretion rather than via increased lipoprotein lipase activity and/or improved metabolism of chylomicron particles.

Coeliac disease and bone mineral density: is normal the true normal?

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Background - The rate of diagnosis of coeliac disease (CD) is increasing. The need to treat patients with few symptoms and normal nutrition is being debated. One reason for treatment is to optimise bone status. Newly diagnosed CD is associated with reduced bone mineral density (BMD) that improves with a gluten free diet. However significance of a "normal" BMD and the effect of a gluten free diet in this population is unexplored.

Objective - to examine bone and bone-related nutritional status of patients with newly diagnosed CD, to identify predictors of abnormalities and effect of the gluten free diet.

Design - 40 consecutive patients aged 20-73 (median 45) yrs, 23% males with CD newly diagnosed by duodenal biopsy were recruited. Patients were classified into 'grossly', 'moderately', or 'minimally' symptomatic; and underwent nutritional assessment: DEXA scan and micronutrient status. Patients with reduced BMD were offered calcium and vitamin D supplementation. The tests were repeated after 12 months on a gluten free diet.

Outcomes - 36% were classified asymptomatic, 41% moderately symptomatic, and 23% grossly symptomatic. At diagnosis, calcium status was normal and vitamin D deficiency was evident in 13%. Total bone density (>-1 SD) was reduced in 16%. A significant relationship was found between total BMD and severity of symptoms ($P = 0.02$), and the degree of villous atrophy ($p = 0.009$). Vitamin D status did not improve despite supplementation. BMD improved in the whole group after twelve months of diet ($P < 0.01$), irrespective of initial BMD.

Conclusion - Severity of gastrointestinal symptoms and villous abnormality predict reduced BMD in newly diagnosed CD indicating the importance of treatment in this group. However, even in the clinically milder group, implementation of a gluten free diet optimises BMD – a desirable clinical goal that potentially reduces future morbidity. Thus, a gluten free diet should be encouraged in all patients with coeliac disease.