

Concurrent Session 4: Cardiovascular Disease

Epigallocatechin gallate concomitantly increases the low density lipoprotein receptor and the CD36 protein in the liver of hypercholesterolaemic rabbits

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Background – The low density lipoprotein receptor (LDL-R) plays an important role in controlling blood cholesterol by binding and internalising LDL into cells. The CD36 protein is one of a family of evolutionary conserved proteins which can serve as scavenger receptors and as such can clear modified LDL from the circulation. Epigallocatechin gallate (EGCG) is a major green tea catechin which has cholesterol-lowering properties.

Objective – The aim of this study was to determine the effects of EGCG on the LDL-R and the CD36 protein in the liver of cholesterol-fed hypercholesterolaemic rabbits.

Design – Twelve New Zealand White rabbits were fed 0.25% (w/w) cholesterol incorporated into their food for two weeks to render them hypercholesterolaemic. This was followed by a 4-week treatment period during which the control group (n=6) remained on the 0.25% (w/w) cholesterol diet without modification while the treatment group (n=6) was fed the same 0.25% (w/w) cholesterol diet with 2% (w/w) EGCG added. The hepatic LDL-R and CD36 proteins were measured by Western blotting.

Outcomes – After the 4-week treatment period, both the hepatic LDL-R (+59%, P<0.001) and the hepatic CD36 protein (+62%, P=0.002) were significantly increased in the treatment group compared to control. The EGCG also reduced serum cholesterol by 85% (P=0.02).

Conclusion – These results indicate that EGCG lowered serum cholesterol levels by concomitantly increasing the hepatic LDL-R and the hepatic CD36 protein.

The effects of lupin kernel flour enriched bread on blood pressure

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Background – Available data suggest that substitution of refined carbohydrate in the diet with protein and fiber may benefit blood pressure. Lupin kernel flour is high in protein and fiber, and low in carbohydrate.

Objective – To determine the effects on blood pressure of modest differences in dietary protein, refined carbohydrate and dietary fibre, brought about by substitution in bread of refined wheat flour-derived carbohydrate with lupin flour.

Design – Overweight and obese men and women (n=88) were randomly assigned to replace 15 to 20% of their usual daily energy intake with either white bread (control) or lupin kernel flour-enriched bread (lupin). Measurements were taken at baseline and 16 wk.

Outcomes – Seventy-four participants, 37 in each group, completed the intervention. Baseline mean (±SD) 24 h ambulatory systolic/diastolic blood pressures were 122.1 ± 9.6/70.8 ± 7.2 mm Hg (control) and 120.1 ± 9.5/71.2 ± 5.9 mm Hg (lupin). For lupin relative to control, the estimated mean net differences in protein, fibre and carbohydrate intakes during the intervention were 13.7 g/d, 12.5 g/d, and -19.9 g/d, respectively. The differences in 24 h ambulatory systolic and diastolic blood pressure, pulse pressure and heart rate were -3.0 (-5.6, -0.3) mm Hg, 0.6 (-1.0, 2.2) mm Hg, -3.5 (-5.3, -1.8) mm Hg, and 0.0 (-1.7, 1.7) bpm, respectively.

Conclusions – A modestly higher intake of dietary protein and fibre can benefit systolic blood pressure and pulse pressure.