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Whole-grain consumption improves arterial stiffness in young adult males

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Evidence from epidemiological studies suggests that diets rich in whole grains can reduce the risk of CVD[(1)]. Only a small amount of evidence from randomised control trials is available to support this beneficial effect, particularly in relation to clinical end points of CVD such as arterial stiffness and endothelial dysfunction[(2)]. Research is currently underway to examine the potential metabolic effects whole grains may have on CVD in a classically 'at risk' group. However, in order to extrapolate these results within a typical population, it is important to determine also the impact that whole grains may have on a relatively younger healthier group.

To quantify these potential effects the present study assessed the physiological impact whole grains may have on a young population group using clinical outcomes that indicate changes in the vasculature.

Thirteen healthy males aged 21–26 years participated in a parallel randomised dietary intervention study. In addition to their normal dietary patterns, participants consumed either two wholegrain rolls (containing 48 g whole grain) or two isoenergetic refined-grain rolls (control) daily for 8 weeks. The following clinical outcomes were recorded pre- and post-intervention: arterial stiffness (pulse wave velocity; PWV); 24 h ambulatory blood pressure; lipid profiles; glycaemic response; anthropometrics.

After 8 weeks the whole-grain intervention group showed a significant reduction in central PWV (Wilcoxon; $P = 0.03$; Fig. 1(a)). There was no significant change for peripheral PWV. No significant changes were detected in the control group for either peripheral or central PWV. No significant changes were detected for blood pressure, lipid profiles, glycaemic response or anthropometric variables for either of the intervention groups.

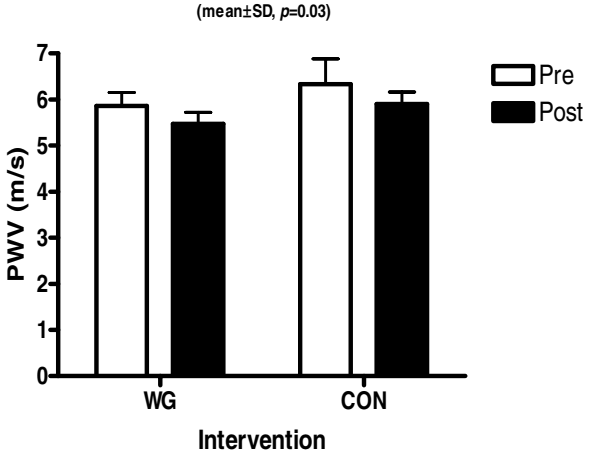

Figure 1a – Carotid-Femoral – Grouped.

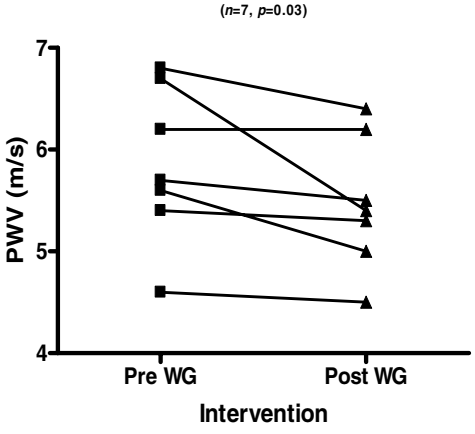

Figure 1b – Carotid-Femoral PWV Individual responses.

These results demonstrate for the first time a positive influence of whole grains on CVD risk using an established reproducible clinical end point such as PWV. Since changes were achieved in a small group at low risk of CVD, the data provides good justification for a cardio-protective role of whole grains. Future research should include extending the cohorts involved, whilst also developing research within differing age-groups and categories of CVD risk.

1. Liu S, Stampfer MJ, Hu FB, Giovannucci, Rimm E, Manson JE, Hennekens CH & Willett WC (1999) *Am J Clin Nutr* **70**, 412–419.
2. Katz DL, Nawaz H, Boukhalil J, Chan W, Ahmadi R, Giannamore V & Sarrel PM (2001) *Prev Med* **33**, 476–484.