

Over- and undernutrition: challenges and approaches. 29 June–2 July 2009

## Pomegranates (*Punica granatum*) and their effect on blood pressure: a randomised double-blind placebo-controlled trial

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Increased levels of reactive oxygen and nitrogen species and decreased levels of antioxidants are increasingly implicated in the pathogenesis of hypertension as a result of damage to the delicate vascular endothelium<sup>(1,2)</sup>. Polyphenols in pomegranate juice (PJ) have been noted to lower systolic blood pressure (SBP) in several trials involving patients who are hypertensive, but only one trial involving subjects who are normotensive<sup>(3)</sup>. The effect of 2 weeks of supplementation with either PJ (POM Wonderful™; Pom Wonderful, Los Angeles, CA, USA) or placebo on blood pressure was examined in healthy students. Data are shown as means and standard deviations.

A randomised double-blind placebo-controlled trial was conducted. Ethical approval was obtained from the University of Nottingham Ethics Committee. Forty-six undergraduate students were recruited: twenty-three male and twenty-three female of mean age 20.4 (SD 1.1) years, SBP 115.3 (SD 12.6) mmHg and BMI 23.5 (SD 3.2) kg/m<sup>2</sup>, with daily alcohol intake notably higher (3.2 (SD 3.1) units) and a daily fruit and vegetable intake lower (4.0 (SD 1.5) portions) than recommended<sup>(4,5)</sup>. Participants were randomly assigned to drink either PJ or a placebo (300 ml/d) for 2 weeks. Basal demographic data and blood pressures were recorded before, during and after 2 weeks of supplementation with juice; dietary habits were recorded concurrently to assess confounding factors.

Independent samples *t* testing indicated that supplementation with PJ had no significant effect on SBP in this student sample ( $P=0.66$ ). However, interestingly, in those subjects with systolic pre-hypertension (SBP between 120 mmHg and 139 mmHg;  $n=15$ ) it was found that the fall in SBP across the 2-week period was significantly greater in those supplemented with PJ ( $-9.1$  (SD 7.2) v.  $-2.2$  (SD 7.2) mmHg;  $t=-2.2$ ,  $P=0.039$ ; Figure). No effect was found on diastolic blood pressure.

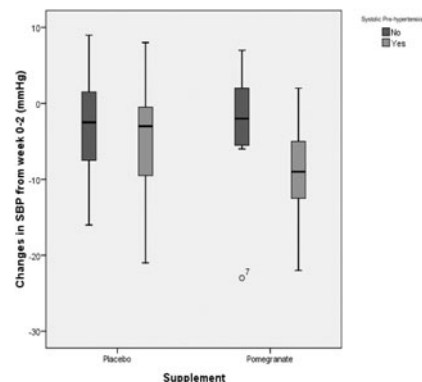


Figure. The change in SBP following 2 weeks of supplementation with either PJ or placebo, grouped by normotensive or systolic pre-hypertensive states ( $n=46$ ).

Unfortunately, BMI and alcohol intake were found to be lower at baseline in those supplemented with PJ ( $P=0.019$  and  $P=0.049$  respectively), whilst fruit and vegetable intake was greater ( $P=0.030$ ), which could account for the lack of significant findings as a result of the cytoprotective measures already present. Future research is needed using an increased sample size to better eliminate dietary confounding factors.

- Rodrigo R, Prat H, Passalacqua *et al.* (2007) *Hypertens Res* **30**, 1159–1167.
- Kashyap MK, Yadav V, Sherawat BS *et al.* (2005) *Mol Cell Biochem* **277**, 89–99.
- Wright H & Broughton Pipkin F (2008) *Proc Nutr Soc* **67**, E418.
- National Health Service (2008) Units Calculator. <http://units.nhs.uk/unitCalculator.html> (accessed November 2008).
- National Health Service (2008) What counts – portion sizes. <http://www.5aday.nhs.uk/WhatCounts/WhatCounts.aspx> (accessed November 2008).