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The effect of pomegranate juice (PomWonderful™) on platelet function

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Platelets play an important role in CVD and there is strong interest in compounds that reduce the risk of developing CVD by inhibiting platelet function. It is recognised that dietary compounds, such as the polyphenolic antioxidants found in wine, cocoa and tea, can affect platelet function[1,2]. A recent surge of interest in the properties of pomegranate juice (PJ) has produced results indicating that PJ may have health benefits. This effect is largely attributed to its high polyphenolic antioxidant content. The present study sought to investigate the effect of PJ supplementation on platelet activation in young healthy volunteers.

The study was a randomized double-blind placebo-controlled trial. A group of healthy student volunteers (*n* 46) were required to drink either PJ (PomWonderful™; Pom Wonderful, Los Angeles, CA, USA) or a placebo for 2 weeks whilst maintaining their normal diet. Whole-blood samples were treated with the platelet agonists arachidonic acid (AA), adrenaline (EPI), thrombin receptor-activating peptide (TRAP), ADP or the thromboxane mimetic U46619, which were added *in vitro* either singly or in combination (Table). The blood samples were then analysed for platelet surface P-selectin expression, a marker of platelet activation, which was detected by flow cytometry using a fluorescent antibody and expressed as median florescence (mf).

Platelet agonists	Concentration (μM)
ADP	10
AA + EPI	0.5 and 100 respectively
TRAP	10
U46619	1
ADP + U46619	10 and 1 respectively

No change was detected in platelet activation in response to either PJ or placebo supplementation in the presence of any of the agonists used when raw data were compared. However, there was a considerable scatter of data with each agonist. BMI in the study groups ranged between 18.9 kg/m^2 and 31.3 kg/m^2, of whom nine were overweight and three obese. It is argued that, since overweight and obesity are considered to be mild inflammatory conditions, the response to PJ might be influenced by BMI. General interactive linear modelling (SPSS version 15.0; SPSS Inc., Chicago, IL, USA) was therefore used to test for interactions between the change in response to the various agonists with juice type as a factor and mean BMI over the duration of the study as a covariate.

No significant interactions were identified for the response to a combination of AA + EPI or to TRAP. However, significant effects were seen for ADP alone (model $P = 0.018$) and U46619 alone (model $P = 0.038$) while the greatest effect was observed with the combination of ADP + U46619 (model $P = 0.001$; effect of juice $P = 0.002$; effect of BMI $P = 0.006$). The mean response to the combination of ADP + U46619 after 2 weeks of juice ingestion was a rise in the placebo group (190 (SE 47) mf) compared with a small fall in the group who had drunk PomWonderful (–37 (SE 46) mf; $P = 0.002$).

PJ has been shown in other studies to have an effect in some inflammatory conditions. It was postulated therefore that those individuals with higher BMI, and therefore a greater inflammatory condition, would show the greater response to PJ supplementation. It is concluded that the present data appear to confirm this hypothesis by showing that individuals with higher BMI display a larger fall in platelet activation following supplementation with PJ than individuals with lower BMI. Future work will need to include a larger number of volunteers in order to better explore this finding.

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