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Pomegranate juice may lower blood pressure

New research shows that pomegranate juice may help to reduce blood pressure. The findings will be presented today at the 2011 Society for Endocrinology conference in Birmingham, UK.

Researcher Dr Emad Al-Dujaili from Queen Margaret University looked at how a daily dose of pomegranate juice might affect blood pressure. The study consisted of 20 participants: 10 took a daily dose of 500ml pomegranate juice and 10 took a placebo of 500ml water. Measurements of blood pressure and urinary hormone levels were taken before and after 30 minutes of exercise, both before starting the study and one week after pomegranate juice.

People who drank the pomegranate juice showed significant improvements in blood pressure after one week, whilst those in the placebo group showed no significant difference in any variable. After one week of daily pomegranate juice consumption, systolic blood pressure levels were lowered both before and after exercise (pre-exercise: 141 ± 20.7 to 136.1 ± 17.3 mmHg, $p=0.03$ and post-exercise: 156.4 ± 17.5 to 149.5 ± 10.2 mmHg, $p=0.04$) as were diastolic blood pressure levels (90.9 ± 11.6 to 87.1 ± 8.7 mmHg, $p=0.04$ and 102.6 ± 23.9 to 94.6 ± 20.4 mmHg, $p=0.05$).

The ratio of cortisol to cortisone in the urine also dropped after a week of pomegranate juice consumption (1.81 ± 1.24 to 0.82 ± 0.56 , $p=0.009$). Cortisol is an active steroid hormone, produced from cholesterol in the adrenal glands, which affects glucose and fat metabolism and can increase blood pressure by altering salt and water balance in the kidneys and colon. In contrast, cortisone is an inactive metabolite of cortisol which exerts no known physiological actions. The inter-conversion of active cortisol and inert cortisone is mediated within organs such as the liver and kidneys by enzymes called 11β -hydroxysteroid dehydrogenases. The decrease in the urinary cortisol to cortisone ratio suggests that compounds present in pomegranate juice may have modified cortisol-cortisone metabolism by these 11β -hydroxysteroid dehydrogenase enzymes.

This is the first time that pomegranate juice has been shown to have a positive effect on blood pressure both before and after exercise. However, this was only a small study on healthy volunteers and the findings need to be validated by a larger trial.

Researcher Dr Emad Al-Dujaili, Senior Lecturer at Queen Margaret University said:

“Blood pressure is controlled by a complicated interaction between hormones, the nervous system and the physical properties of blood and blood vessels. Our study shows that

pomegranate juice may have the potential to lower blood pressure levels both at rest and following exercise. Whilst the effects that we found were slight, they do give us an insight into how pomegranate juice and the hormone cortisol can alter this system in the human body to give health improvements.

“Our study was only on a small number of healthy volunteers, so the next step is to see if pomegranate juice might have similar effects on people with high blood pressure, a known risk factor for heart disease and stroke. We also want to look at whether pomegranate juice has an effect on other areas where glucocorticoids are known to play a part, such as BMI, fat distribution and insulin resistance.”

“Although our findings are promising, this work is still in its early stages. More research needs to be carried out before we could be confident in saying that a glass of pomegranate juice a day would be good for one’s health.”

This study was funded by RJA Foods POME GREAT.

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Notes for editors

This research will be presented as a poster (P139) by Dr Emad Al-Dujaili at the Society for Endocrinology BES meeting at 13:00-14:00, Tuesday 12 April 2011. The abstract for this work is reproduced at: <http://www.endocrine-abstracts.org/ea/0025/ea0025P139.htm>.

The Society for Endocrinology BES 2011 conference is Britain’s biggest scientific meeting on hormones, and is taking place at the Birmingham ICC from 11-14 April 2011. For the full programme, please click [here](#).

Please mention the Society for Endocrinology conference in any story

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The Society for Endocrinology is Britain’s national organisation promoting endocrinology and hormone awareness. For general information, please visit our website: <http://www.endocrinology.org>

ABSTRACT

Pomegranate juice consumption influences urinary glucocorticoids, attenuates blood pressure and exercise-induced oxidative stress in healthy volunteers

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Background and Aim: Antioxidants have been postulated to exert beneficial effects on cardiovascular and neurodegenerative diseases by neutralizing reactive oxygen species (ROS). Exercise and metabolic processes are known to produce ROS. Pomegranates are rich in polyphenolic antioxidants. The aim of this study is to investigate the effects of pomegranate pure juice consumption on blood pressure, lipid peroxidation and urinary glucocorticoid levels before and after a moderate exercise bout.

Methods: A randomized placebo controlled 2-arm study was conducted. Participants (2 groups of 10 each) attended two 30 minute treadmill exercise sessions (50% W_{max}); pre and one week post pomegranate juice (500mL/day containing 1685 mg total phenolics/L) or water consumption. 24h urine samples were collected and blood pressure monitored before and after each session. Urinary lipid peroxidation levels (TBARS), free cortisol and cortisone levels were determined in all urine samples using in house ELISA methods.

Results: Pomegranate juice consumption was found to significantly decrease systolic blood pressure (Pre-exercise: 141 ± 20.7 to 136.1 ± 17.3 , $p=0.03$ and post-exercise: 156.4 ± 17.5 to 149.5 ± 10.2 mmHg, $p=0.04$), diastolic blood pressure (90.9 ± 11.6 to 87.1 ± 8.7 , $p=0.04$ and 102.6 ± 23.9 to 94.6 ± 20.4 mmHg, $p=0.05$) and TBARS levels (0.312 ± 0.106 to 0.264 ± 0.098 MDA mM/L, $p=0.035$). There was no significant change in lipid peroxidation or blood pressure for subjects consuming water. Urinary free cortisol was reduced from 39.1 ± 26.6 to 26.4 ± 16.5 nmole/24h ($p=0.064$), however there was a statistically significant increase in urinary free cortisone (28.1 ± 20.4 to 51.9 ± 45.1 nmole/24h, $p=0.045$), and decrease in free cortisol/cortisone ratio (1.81 ± 1.24 to 0.82 ± 0.56 , $p=0.009$) following one week of pomegranate juice intake.

Conclusions: Our results suggest that pomegranate juice seems to exert beneficial effects in reducing blood pressure pre/post exercise and lipid peroxidation levels due to exercise-induced oxidative stress. The reduction in blood pressure could presumably be due to the inhibition of 11β -HSD1 activity as evidenced by the reduction in cortisol/cortisone ratio or other mechanisms yet to be investigated.