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The acute impact of high anthocyanin cherry juice on cognition and blood pressure in young people, older people and dementia patients

K Caldwell

University of Wollongong, kc582@uowmail.edu.au

K E. Charlton

University of Wollongong, karenc@uow.edu.au

S Roodenrys

University of Wollongong, steven@uow.edu.au

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Abstract

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Keywords

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Poster Session 2: Thursday 29 November

P27

The association between body composition and bone mass in young Australians

K Zhu^{1,2}, K Briffa³, A Smith³, J Mountain⁴, AM Briggs⁵,
L Straker³, J Walsh^{1,2}

¹Department of Endocrinology and Diabetes, Sir Charles Gairdner Hospital, ²School of Medicine and Pharmacology, University of Western Australia, ³School of Physiotherapy, Curtin University, ⁴Telethon Institute for Child Health Research, ⁵CHIRI, Curtin University, Perth, WA

Background

Increasing body weight is associated with higher peak bone mass. However, there are limited data on the relative importance of lean and fat mass on peak bone mass in young Australians.

Objectives

The aims of this study were to compare bone mass and bone density attained at 20 years in males and females and to evaluate the association between body composition and bone mineral measures.

Design

The study subjects were 578 girls and 611 boys from the West Australian Pregnancy Cohort (Raine Study) who had a whole body dual energy x-ray absorptiometry (DXA) scan acquired at 20 years. Lean and fat body mass, bone mineral content (BMC) and areal bone mineral density (BMD) of whole body were obtained from the DXA scan. Height and weight were measured.

Outcomes

Male subjects were significantly taller (178.3 ± 7.1 vs 165.9 ± 6.4 cm, $P < 0.001$), heavier (76.8 ± 4.0 vs 65.3 ± 13.1 kg, $P < 0.001$), and had significantly higher total body BMC (3174 ± 429 vs 2692 ± 329 g, $P < 0.001$) and BMD (1.121 ± 0.108 vs 1.021 ± 0.086 g/cm², $P < 0.001$) compared to young females. After adjustment for height and body mass, the difference for total body BMC was no longer significant (2952 ± 12 vs 2927 ± 12 g, $P = 0.202$), whereas the difference remained for total body BMD (1.092 ± 0.004 vs 1.051 ± 0.004 g/cm², $P < 0.001$). In multivariate linear regression models with height, lean and fat mass as predictor variables, lean mass was the most significant predictor of total body BMC and BMD in both male (explained 64.2% and 43.4% of the variation, respectively) and female participants (explained 42.9% and 30.8% of the variation, respectively). Fat mass was a more important predictor of total body BMC and BMD in female (explained 13.1% and 7.4% of the variation, respectively) than in male (explained 1.8% of the variation for both).

Conclusion

Lean body mass was the most significant independent predictor of total body BMC and BMD in both males and females. Fat mass was a more important predictor of total body bone mass in females than in males.

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P28

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K Caldwell, KE Charlton, S Roodenrys
University of Wollongong, Wollongong, NSW

Background

Anthocyanins have shown to provide specific neuroprotective effects and may improve cognitive function. Proposed mechanisms partly relate to their potential to acutely affect endothelial function, blood pressure and cerebrovascular blood flow. However, the frequency and quantity of intake of anthocyanins that is required to result in these benefits has not been determined.

Objective

To compare the effect of differing doses of anthocyanins, provided by cherry juice, on acute cognitive functioning and blood pressure in different age groups.

Design

Using a cross-over design, young adults 18-35yrs ($n=6$), older healthy adults, 60+yrs ($n=5$), and older adults with mild to moderate dementia ($n=5$) were assigned to receive, in random order, either a single dose of 300ml high-anthocyanin cherry juice or 3 x 100ml servings of cherry juice at 0, 1 and 2hrs. Blood pressure was measured at 0, 2 and 6 hrs. Cognitive tests, administered at baseline and 6 hrs, included a task switching test (higher executive function), a letter and pattern comparison task (speed of processing), and a RAVLT list-learning task (verbal memory). Two-way mixed-design ANOVA was conducted.

Outcomes

Regardless of dose, cherry juice had no acute impact on cognitive function in young people, older people or dementia patients. Overall, a large single dose of cherry juice resulted in a significant change in heart rate ($p=0.024$) and diastolic blood pressure ($p=0.016$), and approached significance for systolic blood pressure ($p=0.066$). The triple dose of juice had no significant impact on blood pressure or heart rate measurements. No group effect was evident for age, in either dose.

Conclusion

Acute intake of anthocyanins does not appear to change short-term cognitive performance. Consumption of a single large serve of cherry juice may have an acute impact on cardiovascular function in young adults, older adults and dementia patients similarly. A lack of effect for the three small servings of juice over 3 hours suggests a minimum threshold of uptake must be reached to induce bioactive effects.

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