

## Effect of bilberry juice on muscle damage and inflammation in runners completing a half marathon

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Long distance running causes muscle damage, which is characterised by oxidative stress, inflammation, pain and loss of muscle force<sup>(1)</sup>. Emerging evidence suggests that supplementation with polyphenols may protect against exercise induced muscle damage (EIMD) or accelerate recovery<sup>(2)</sup>. Bilberries are a rich source of polyphenols<sup>(3)</sup>, but no studies have reported whether bilberry consumption can influence EIMD. We conducted a single blind, randomised, placebo controlled study to determine whether bilberry juice reduced symptoms of EIMD in 21 recreationally trained runners (age 18–55 y). Participants consumed 2 × 200 ml of bilberry juice or energy matched control drink for 5 d before completing the Sheffield Half Marathon, on race day and for 2 days post-race. Measurements were taken at baseline, pre-race, post-race, 24 h post-race and 48 h post-race. The study was approved by the Ethics Committee of Sheffield Hallam University and all participants provided written informed consent.

Serum creatine kinase (CK; a marker of muscle damage) was measured using an enzyme kinetics kit (SpinReact, Girona, Spain). Serum C-reactive protein (CRP; a marker of inflammation) was measured using a commercial ELISA kit (R&D Systems, Abingdon, UK). Delayed onset muscle soreness (DOMS) was assessed using a 200 mm visual analogue scale (VAS). Participants were asked to squat to a 90° angle, return to a standing position and then rate their soreness on the VAS scale<sup>(1)</sup>. A mixed model ANOVA was used to analyse the data; Greenhouse-Geisser correction was used where necessary. CRP data was log transformed before analysis.

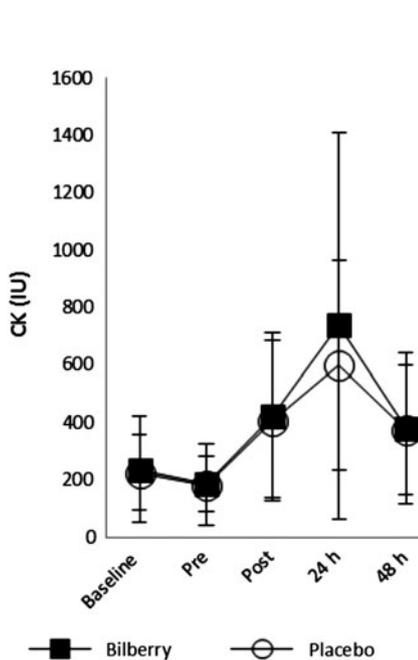


Fig 1. CK; values are mean (SD)

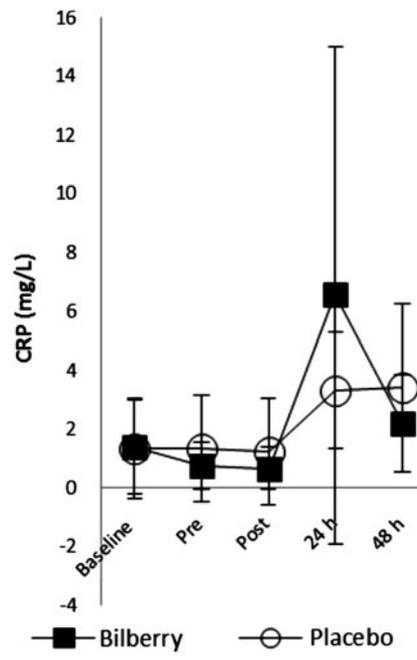


Fig 2. CRP; values are mean (SD)

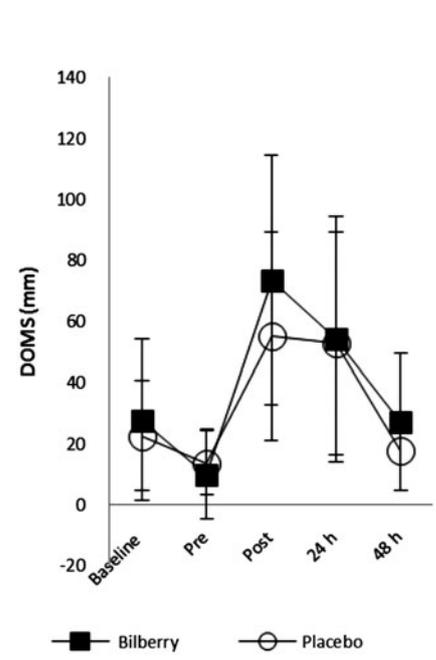


Fig 3. DOMS; values are mean (SD)

There were statistically significant main effects of time on muscle damage (Fig 1;  $F(1.50, 23.92) = 12.94$ ;  $P < 0.001$ ), inflammation (Fig 2;  $F(1.88, 31.89) = 29.49$ ;  $P < 0.001$ ) and DOMS (Fig 3;  $F(2.58, 43.87) = 17.39$ ;  $P < 0.001$ ), but no statistically significant main effects of drink type on any of the outcome measures. There were also no statistically significant interactions between drink and time. In conclusion, despite being rich in polyphenols, bilberry juice failed to attenuate the rise in muscle damage, inflammation and pain that follows a half marathon or enhance the rate of recovery.

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