



Circuit training on oxidative stress and arterial health: a health promotion perspective for obese adult men

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Reviewed by OUR EXPERTS  With Expert Review from Karin Elgar

Obesity can lead to increased oxidative stress, which disrupts the body's ability to manage harmful substances and reduces the availability of nitric oxide (a molecule that helps blood vessels relax). This can result in stiffer arteries, raising the risk of cardiovascular disease. Circuit training, which combines aerobic exercise with resistance training, may help improve the body's antioxidant system and overall vascular health. 25 obese men were randomly assigned to a circuit training group (n=13) or a non-exercising control group (n=12) for 12-weeks.

The results showed that after 12 weeks of circuit training, the exercise group demonstrated significant improvements compared to the control group including decreased body mass index, increased antioxidant capacity, and a reduced

overall oxidative stress burden. Nitric oxide levels increased significantly, suggesting improved blood vessel function. Arterial stiffness decreased significantly, indicating that the arteries became more flexible.

In conclusion, 12 weeks of circuit training at moderate-to-vigorous intensity significantly improves the antioxidant system, reduces arterial stiffness, and lowers body mass index in obese adult men. These findings support the role of circuit training as a non-pharmacological, health-promoting intervention to improve both metabolic and cardiovascular risk in obese men. Healthcare professionals and exercise specialists may consider circuit training as an accessible and effective approach to reducing cardiovascular disease risk in this population. ■



The efficacy of resveratrol supplementation on inflammation and oxidative stress in type-2 diabetes mellitus patients: randomized double-blind placebo meta-analysis

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With Expert Review from Karin Elgar

Resveratrol, found in foods including grapes, nuts and berries, has attracted interest for its potential anti-inflammatory and antioxidant effects, although evidence in type 2 diabetes remains inconsistent.

This systematic review and meta-analysis of six randomised controlled trials involving 533 individuals investigated the effects of resveratrol on markers of inflammation and oxidative stress. Resveratrol significantly improved several—but not all—outcomes, including C-reactive protein, lipid peroxides, oxidative stress scores and glutathione peroxidase. However, the certainty of evidence was rated low to very low, limiting confidence in these findings. ■

Clinical trial of the effects of postbiotic supplementation on inflammation, oxidative stress, and clinical outcomes in patients with CVA

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Current stroke treatment largely focuses on restoring and protecting brain function, but growing attention is being directed towards downstream effects including inflammation, oxidative stress and gastrointestinal dysfunction. While probiotics can support gut health, their use may be associated with side effects. Postbiotics, which are non-viable microbial products, may offer similar gastrointestinal benefits with fewer adverse effects.

This seven-day randomised controlled trial involving 120 people following stroke investigated the effects of postbiotic supplementation on clinical outcomes. Compared with controls, postbiotics improved inflammatory and oxidative stress markers and reduced the incidence of pneumonia. However, there were no significant improvements in neurological function or overall illness severity. The findings suggest that postbiotics may help reduce inflammation, oxidative stress and pneumonia risk following stroke, although they do not appear to improve short-term neurological outcomes or severity. ■

Urine metabolomics unravel the effects of short-term dietary interventions on oxidative stress and inflammation: a randomized controlled crossover trial

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This randomised controlled crossover trial involving 48 Korean adults with obesity investigated whether different dietary patterns influence oxidative stress and inflammation, and whether these effects can be detected through metabolites in urine. The study compared the effects of three four-week dietary interventions: a balanced Korean diet (BKD), a diet based on the 2010 Dietary Guidelines for Americans, and a typical American diet (TAD). The BKD and Dietary Guidelines for Americans diets had significantly greater antioxidant capacity and phenolic and flavonoid content than the TAD. Interestingly, despite these differences, traditional blood markers of oxidative stress and inflammation changed only marginally. The differences became much clearer when researchers looked at the urine metabolome. Urinary metabolite profiles differed according to dietary pattern, with recommended diets showing greater levels of benzoic acid and phenolic derivatives, while metabolites associated with oxidative stress were higher following the TAD compared with the BKD. The findings showed that the metabolic effects of dietary change may be detectable even when conventional blood biomarkers show little change, highlighting urinary metabolomics as a potentially valuable tool for understanding how diet influences oxidative stress and metabolic health. ■