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Effect of carnosine supplementation on cardiometabolic risk factors in obesity, prediabetes, and diabetes: a meta-analysis of randomized controlled trials

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The burden of diabetes is rapidly increasing in line with the growing obesity epidemic. Identification of simple and easily scalable interventions is therefore urgently needed. Carnosine (beta-alanyl-L-histidine), a dipeptide with anti-inflammatory, anti-oxidative, and anti-glycating properties, has been proposed as a potential strategy for the prevention of diabetes. However, previous studies examining the effects of carnosine on cardiometabolic risk factors have produced inconsistent results. Here, we present the first systematic review and meta-analysis examining the effects of carnosine supplementation on cardiometabolic risk factors. Electronic databases including Medline, CINAHL, EMBASE and EBM Reviews were searched to identify all randomized controlled trials (RCTs) comparing supplementation with carnosine versus placebo, usual care or other interventions. In meta-analyses of five trials with 309 participants, carnosine-supplemented groups had lower HbA_{1c} (mean difference (MD) [95% CI] = −0.5% [−0.4, −0.6], $p < 0.001$); fasting glucose (MD [95%CI] = −0.6 mmol/L [−1.1, −0.1], $p = 0.03$); postprandial glucose (MD [95%CI] = −1.0 mmol/L [−1.4, −0.6], $p < 0.001$); triglycerides (MD [95%CI] = −0.4 mmol/L [−0.6, −0.3], $p = 0.005$); and high-sensitivity C-reactive protein (MD [95%CI] = −0.4 mg/L [−0.6, −0.2], $p < 0.001$) compared with placebo. Low statistical heterogeneity was observed for all outcomes ($I^2 = 0$ –1%) except fasting glucose ($I^2 = 84\%$). However, heterogeneity in study design was an important limitation, including the different populations studied, and the use of varying doses of carnosine and mixed supplementation. Nevertheless, our findings suggest that carnosine may improve cardiometabolic risk factors and further well designed randomized controlled trials are needed to confirm these findings.

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Comparing two exercise training doses on arterial stiffness and blood pressure in adults with overweight/obesity and type 2 diabetes: a randomised controlled trial

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Introduction & aims: Arterial stiffness (AS) is thought to increase with glucose intolerance. Combined aerobic and resistance moderate intensity continuous training (C-MICT) has been shown to improve AS in people with chronic disease. The combination of high-intensity interval aerobic with high-intensity resistance training (C-HIIT) has not been previously investigated in adults with type 2 diabetes (T2D). We aimed to compare the efficacy of 8 weeks of low volume C-HIIT and C-MICT on AS, central and peripheral blood pressures in adults with T2D.

Methods: Forty sedentary adults (60 ± 8 y) with overweight/obesity ($\text{BMI} = 31.5 \pm 6.9 \text{ kg/m}^2$) and T2D (glycated



haemoglobin [HbA_{1c}] $61 \pm 13 \text{ mmol/mol}$ [$7.7 \pm 1.2\%$]) were randomised into 8 wks of either: low volume C-HIIT ($n = 14$), C-MICT ($n = 16$), or control ($n = 10$). C-HIIT involved aerobic exercise for 4 min at 85–95% peak heart rate (HR_{peak}) followed by high-intensity resistance training (Rate of Perceived Exertion [RPE] ≥ 17) involving 8 exercises for 1-min each, on three days/week. Session time was 26 mins = 78 mins/week. C-MICT comprised aerobic exercise for 150 mins/wk over four days at 55–69% HR_{peak} and moderate intensity resistance training 60 mins/wk (RPE 11–13). Total exercise time = 210 mins/week. AS was assessed using pulse wave velocity (PWV), central blood pressures were assessed using pulse wave analysis and peripheral pressures using sphygmomanometry; at baseline and post-intervention. ANCOVA was used to determine differences in change scores between groups using the baseline value as the covariate.

Results: There were no significant between-group differences for change in PWV ($0.2 \pm 0.1 \text{ m/s}$, $0.2 \pm 0.2 \text{ m/s}$, and $0.2 \pm 0.4 \text{ m/s}$ for C-HIIT, C-MICT and control, respectively), central systolic ($0.2 \pm 2.7 \text{ mmHg}$, $-1.3 \pm 1.3 \text{ mmHg}$, $2.8 \pm 3.7 \text{ mmHg}$) and diastolic ($-0.6 \pm 1.5 \text{ mmHg}$, $-1.8 \pm 1.1 \text{ mmHg}$, $1.7 \pm 3.2 \text{ mmHg}$) pressures, and peripheral systolic ($0.2 \pm 3.1 \text{ mmHg}$, $-1.2 \pm 1.5 \text{ mmHg}$, $3.4 \pm 4.0 \text{ mmHg}$) and diastolic ($-0.4 \pm 1.5 \text{ mmHg}$, $-1.7 \pm 1.1 \text{ mmHg}$, $1.7 \pm 3.1 \text{ mmHg}$) pressures.

Conclusion: The novel findings from this study are that 8 weeks of low volume C-HIIT and C-MICT did not significantly reduce AS, central or peripheral blood pressures in adults with T2D.

Trial registration: ACTRN12615000475549.

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Development and integration of an online standard clinical tool to assess lifestyle habits of children enrolled in paediatric weight management services in New South Wales

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Introduction: Standardised clinical data collection tools facilitate data sharing and the evaluation of clinical services across many sites. With the recent growth of secondary and tertiary paediatric obesity clinical services in New South Wales (NSW), there was a need for the development of a common questionnaire to assess the lifestyle habits and anthropometry of children and adolescents. Standardised clinical data collection will enable assessment of the impact of paediatric weight management services across NSW on patient outcomes and allow for comparison of services NSW-wide.

Methods: Clinicians and researchers in paediatric weight management services across NSW assisted in the development of the Healthy Lifestyle Questionnaire (HLQ). The HLQ was based on validated questions used in previous national data collection tools including the 2015 NSW Schools Physical Activity and Nutrition Survey and the 2011–2012 NSW Population Health Survey. The HLQ was then built on the online database application Research Electronic Data Capture (REDCap) with each site enabling specific REDCap functions to facilitate data collection at their clinic, including automated invitations for longitudinal data collection.

