Abstract


Effects of vitamin C supplementation on glycaemic control: a systematic review and meta-analysis of randomised controlled trials.

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OBJECTIVE: Randomised controlled trials (RCTs) have observed contrasting results on the effects of vitamin C on circulating biomarkers of glycaemic and insulin regulation. We conducted a systematic review and meta-analysis of RCTs testing the effect of vitamin C administration on glucose, HbA1c and insulin concentrations.

METHODS: Four databases (PubMed, Embase, Scopus and Cochrane Library) were used to retrieve RCTs published from inception until April 2016 and testing the effects of vitamin C in adult participants. The screening of 2008 articles yielded 22 eligible studies (937 participants).

RESULTS: Overall, vitamin C did not modify glucose, HbA1c and insulin concentrations. However, subgroup analyses showed that vitamin C significantly reduced glucose concentrations (-0.44 mmol/l, 95% CI: -0.81, -0.07, P=0.01) in patients with type 2 diabetes and in interventions with a duration greater than 30 days (-0.53%, 95% CI: -0.79, -0.10, P=0.02). Vitamin C administration had greater effects on fasting (-13.63 pmol/l, 95% CI: -22.73, -4.54, P<0.01) compared to postprandial insulin concentration. Meta-regression analyses showed that age was a modifier of the effect of vitamin C on insulin concentration. Furthermore, the effect size was associated with baseline BMI and plasma glucose levels, and with the duration of the intervention.

CONCLUSION: In conclusion, greater reduction in glucose concentrations observed in patients with diabetes, older individuals and with more prolonged supplementation. Personalised interventions with vitamin C may represent a feasible future strategy to enhance benefits and efficacy of interventions. Nevertheless, results need to be interpreted cautiously due to limitations in the primary studies analysed.

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