Reviewer's report

Title: Dietary ascorbic acid and subsequent change in body weight and waist circumference: associations may depend on genetic predisposition to obesity - a prospective study of three independent cohorts

Version: 2 Date: 9 March 2014

Reviewer: Carol Johnston

Reviewer's report:

This report examines relationships between dietary vitamin C, genetic predisposition to weight gain, and change in body weight and waist circumference over time. The paper is well written and the analyses appear to have been carefully conducted. These results contribute to the limited literature on vitamin C and adiposity, but there are concerns with the paper.

Major

1. The analyses focus on 3 cohorts followed for ~five years with average cohort weight gains ranging from 0.5 to 2 pounds (0.2-1.0 kg). [In fact, the DCH study excluded those with >5 kg weight gains per year (line 121).] Hence, the degree of weight gain in these cohorts is modest - particularly in comparison to other cohorts such as the CARDIA study which reported 5-y weight gains in the range of 6.6 to 11.0 pounds (3-5 kg) in similar calendar years. It is possible that the lack of results noted herein could be a result of the modest change in body weight in these populations overall. Also, the authors did not demonstrate a relationship between genetic predispositions to weight gain and change in body weight suggesting that these populations may not be appropriate to test these hypotheses. Also, these populations appear to practice healthy lifestyles (>80% are physically active and average energy intakes are modest energy).

2. The authors cite cross-sectional trials in humans (and one intervention trial) regarding vitamin C and body mass, but they do not discuss the mechanistic studies in animal models. Reference to these articles may help elucidate mechanisms to a better degree. (e.g., see J. Campion)

3. Using dietary data to assess vitamin C status is problematic. Dietary intake is not necessarily representative of nutrient availability at the tissue level. Biomarkers should be used in epidemiological studies aimed at examining vitamin C status. This is an important limitation of this work.

Minor

4. At line 200 it states that WC was calculated for the MONICA cohort – yet this measure was not available for this cohort.

5. Line 257: ‘where’ not ‘were’??

6. Please report dietary data as a whole number (not to the tenth decimal; lines 281-282). This level accuracy is not appropriate.
7. Was BW or WC related to vitamin C intake at baseline? This was reported for SNPs (line 303) but not for vitamin C intake.

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests'