PP54

Glycemia and phosphatemia in South Africa's stone-prone and stone-free population groups: a preliminary study on the effects of maltitol ingestion

T. Theka, A. Rodgers, D. Webber
University of Cape Town, Cape Town, South Africa

Objectives: Urolithiasis is rare in South Africa's black (B) population while it is more prevalent in the white (W) population. An association between carbohydrate ingestion and urolithiasis is well-known. Nguyen *et al* (1993) reported that following glucose (Glu) ingestion (20g) in healthy subjects, glycemia increased (after 30 min) and phosphatemia decreased while maltitol (Mal) ingestion (20g) also provoked an increase in glycemia but no change in phosphatemia. We investigated the effects of ingestion of these refined carbohydrates on glycemia and phosphatemia in stone-prone (W) and relatively stone-free (B) population groups.
Materials and Methods: 8 Healthy B and W males (18-30 years) followed a self-selected diet for 7 Days and a strict standardized diet (Day 8). Following an overnight fast, subjects provided blood samples (baseline and 30 min after randomly assigned to ingest refined carbohydrate solution - 20g of Glu in 250ml low mineral-content water (Protocol 1, Week 1), wash-out period of 1 week, and Mal (Protocol 2, Week 2). Blood Glu and serum phosphate were measured.
Results: Following Glu ingestion, glycemia increased by 12.8% in B and by 29.2% in W relative to baseline, while phosphatemia decreased by 12.9% in B and by 7.26% in W. Following Mal ingestion, glycemia increased by ~10% in both groups whereas phosphatemia decreased by 9.4% in B and by 4.8% in W. Inter-group comparisons revealed that following protocol 1, B had a significantly lower phosphatemia than W ($p=0.0316$).
Conclusion: The two groups demonstrated different renal handling mechanisms for the two refined carbohydrates. The decreases in phosphatemia (more sensitive in B) might lead to decreases in phosphaturia and hence lower the associated stone-risk. W should preferentially use Mal as an artificial sweetener instead of Glu, as the latter had a 3X more profound effect on glycemia (a risk factor for calcium oxalate stone formation).
Acknowledgements: The authors wish to thank the South African Medical Research Council, Oppenheimer Memorial Trust and University of Cape Town for financial assistance.