

Concurrent Session 5: Bone Mass and Body Composition

The vitamin D status of toddlers and preschool children living in Adelaide

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Background – Normal growth and development of bones in children requires adequate vitamin D. Severe vitamin D deficiency results in ricketic bones whereas suboptimal status can lead to lower bone mineral density and bone accretion rates. Results from a national survey in New Zealand of school age children 5-14 y revealed that 31% of children had low vitamin D status – serum 25-hydroxyvitamin D concentration less than 37.5 nmol/L. Little is known about vitamin D status of toddlers or preschool children in Australia and New Zealand.

Objective – To determine vitamin D status of toddlers and pre-school age children in South Australia.

Design – A cross-sectional survey of 300 children between the ages of 12-60 months living in Adelaide. Children were recruited using a door-knocking protocol to obtain a representative sample of this age group. Blood samples were collected and serum 25-hydroxyvitamin D concentrations measured using radioimmunoassay kits from DiaSorin.

Outcomes – The number of blood samples collected in each month of a calendar year was similar. The mean concentration (interquartile range) of serum 25-hydroxyvitamin D for all children was 75 (54, 87) nmol/L. Nine percent of participants had serum 25-hydroxyvitamin D concentrations less than 37.5 nmol/L. Vitamin D status did not differ across the year age groups.

Conclusions – These results suggest that the vitamin D status of toddlers and children living in Adelaide is good.

Calcium absorption in Australian osteopenic post menopausal women:

Comparative study of fortified soymilk to fermented fortified soymilk

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Background – Probiotics are known to protect its host and can help in the prevention of various diseases. Fermenting calcium-fortified soymilk with probiotics can also potentially enhance bioavailability due to increased calcium solubility; bioactive isoflavone aglycone enrichment and phytic acid degradation. Soymilk is often consumed to reduce menopausal symptoms and it is supplemented with calcium fortificants to ensure adequate calcium content. Osteoporosis is a serious health threat for aging post-menopausal women; therefore, there is a need to increase the bioavailability of calcium from fortified soymilk.

Objective – Compare the calcium absorption of fortified soymilk to fermented fortified soymilk in 12 osteopenic postmenopausal women using a randomised single-blind cross-over study. Fortified soymilk was inoculated with a *Lactobacillus* strain namely *L. acidophilus* ATCC 4962 and fermented for 24 h at 37°C. Anthropometric measurements of weight, height and bioelectrical impedance analysis (BIA) were taken and calcium absorption was measured using a single-isotope radiocalcium method. Participants consumed an oral dose of 5 µCi of ⁴⁵Ca in 24 mg of calcium carrier from each drink.

Outcomes – The mean (± SD) age and BMI were 54.5 (± 12.8) yr and 26.5 (± 5.7) kg/m², respectively. All participants had a sub-optimal to normal vitamin D levels, mean = 60.9 (± 19.0) nmol/L. The mean fractional calcium absorption (α) values from soymilk and fermented soymilk were 0.65 (± 0.23) and 0.82 (± 0.65) respectively. The calcium absorption from the fermented soymilk was higher than that from plain soymilk, however, there was no significant difference (P>0.05) between the means. Fermentation of soymilk can provide various health benefits however; longer studies are required to confirm its potential in increasing calcium bioavailability.