Title: Vitamin D and bone health status of Australian women

RM Vearing, Kathryn Hart, Susan Lanham-New, Marcela Moraes-Mendes, Andrea L Darling, Yasmine Probst, Karen Charlton

Introduction: Vitamin D deficiency is highly prevalent globally, even in countries that are considered to have a 'sunny' climate, such as Australia. Twenty three percent of the Australian population are considered vitamin D deficient (25(OH)D <50nmol/L), with levels increasing to 36% in the winter (Australian Health Survey 2011-12).

Methods: This cross-sectional study was conducted at the University of Wollongong (34.42° S) and primarily explored the serum 25(OH)D women in winter and spring in 2020 and 2021 (n=100, >18 years, pre- or post- menopausal). Ethnicity and skin type were self-defined. Serum 25(OH)D was measured through liquid chromatography mass spectrometry, bone density through dual energy x-ray absorptiometry and sun exposure through a polysulphone film badge.

Results: The mean age of the participants was 41.41 ± 15.46 years. N=98 women had a valid 25(OH)D measurement. Of these, n=1.0 (1.0%) were deficient (<25nmol/L), n=14.0 (14.3%) were insufficient (25-50nmol/L) and n=41.0 (41.8%) were sufficient (>50nmol/L) and n=42.0 (42.9%) were considered optimal (>75nmol/L). Mean 25(OH)D was significantly different across skin type groups, ($F(4,93)=2.6$, $p=0.04$) whilst average sun exposure significantly predicted 25(OH)D ($F(1, 91) = 5.276$, $p=0.02$). There was a significant but small positive correlation between 25(OH)D and total BMD, $r(96) = 0.27$, $p=0.007$. Analysis is ongoing to explore vitamin D dietary intake and prediction of vitamin D deficiency.

Conclusion: Vitamin D status in this sample was found to be higher than in previous Australian studies, which is favourable given the essential role vitamin D plays in calcium homeostasis and bone health. However, further research into vitamin D dietary intake is crucial in Australia, given the increased risk of melanoma as a result of excessive sun exposure as well as the lack of naturally occurring vitamin D containing foods or fortified products in the food supply.