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Role of sunlight exposure and food fortification in maintaining vitamin D status in Australian aged care residents

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Background – Vitamin D deficiency is prevalent in aged care residents as access to sunlight is difficult and dietary intake is low because few foods contain vitamin D.

Objective – To determine the contribution of sun exposure and dietary vitamin D intake to vitamin D status in residents in an Australian residential aged care facility.

Design – A group of 83 residents were drawn from a larger study which examined the effect of vitamin D fortified milk supplementation (cholecalciferol 5 µg/100 mL) for six months on nutritional status. Serum 25(OH)D concentrations were measured at baseline and six months. The estimation of personal UV exposure over a period of two days was made using a UV dosimeter.

Outcomes – Baseline serum 25(OH)D concentration, mean (SD) 31.5 (18.0) nmol/L, was positively correlated to UV exposure ($r = 0.28$, $P = 0.0118$). Vitamin D from the fortified milk was the major factor contributing to the improvement of vitamin D status (21% of variance, $P = 0.0049$). Serum 25(OH)D at six months, 47.9 (18.4) nmol/L, was positively related to total vitamin D intake when fortified milk was provided ($r = 0.52$, $P = 0.0003$), but not to UV exposure ($r = -0.02$, $P = 0.9185$). The mobility level, as expressed as total Activities of Daily Living score, explained about 16% variance of serum 25(OH)D concentration at six months ($P = 0.0072$).

Conclusions – Results of this study indicate that many Australian care residents are suffering from vitamin D insufficiency/deficiency. Increased exposure to sunlight in combination with vitamin D fortified milk could assist in improving vitamin D status. However it is not clear if the adoption of these strategies will be sufficient to raise serum 25(OH)D to a level high enough to prevent falls and fractures.