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Very high prevalence of vitamin D deficiency in South Asian adults (n 6433) in the UK Biobank: urgent action required

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Abstract
Published studies have suggested a high prevalence of 25-hydroxyvitamin D (25OHD) deficiency in western dwelling South Asians, particularly in women. However, sample sizes have been relatively small with few men. Moreover, South Asians are vastly under-represented in national dietary surveys and further research into 25(OH)D status is needed. The UK Biobank is a cohort of 500,000 individuals; *n* 6433 are of South Asian ethnicity and have baseline serum 25(OH)D data (2006–2010, aged 40–69 years). Blood draws were spread across the year. Of note, the 25(OH)D measurements were produced using the DiaSorin Liaison XL assay which underestimates 25(OH)D by 4% at 25nmol/L, but overestimates 25(OH)D by 5–10% at ≥ 40nmol/ΛL[1]. We used the commonly used cut-points of < 25nmol/L (deficiency), < 50nmol/L (insufficiency). In women (*n* 2927), median (IQR) was 24.3 (20.5) nmol/L with 50.4% < 25nmol/L, and 88.6% < 50nmol/L. In men (*n* 3506), median (IQR) was 21.7 (16.2) with 58.4% < 25 nmol/L and 93.8% < 50 nmol/L. Of concern, 17.8% of women and 21.1% of men had 25(OH)D < 15nmol/L. A Mann Whitney test showed that gender differences were statistically significant ($P < 0.0001$). In terms of ethnic sub-groups, in the Bangladeshi group (*n* 207), median (IQR) was 26.1 (14.3) nmol/L with 43.5% < 25nmol/L and 91.3% < 50nmol/L. In the Indian group (*n* 4792), median (IQR) was 23.8 (19.3) with 52.0% < 25nmol/L and 90.4% < 50nmol/L. Finally, in the Pakistani group (*n* 1434) median (IQR) was 19.3(14.5) with 65.7% < 25nmol/L and 94.9% < 50nmol/L. A Kruskal Wallis test showed that ethnic sub-group differences were statistically significant ($P < 0.0001$). To the authors' knowledge, this is the largest analysis to date of 25(OH)D status in European dwelling South Asians. Deficiency of 25(OH)D was almost universal, with 50% or more not even reaching 25nmol/L. Of great concern, 20% of participants had levels < 15nmol/L which, although not a widely used cut-off point, still represents severe deficiency and likely osteomalacia. Moreover, these results are most probably an *underestimation* of this societal challenge as the UK Biobank is likely to contain participants that are healthier and more educated than the general population. In conclusion, our analyses suggest the need for urgent public health interventions to prevent and treat vitamin D deficiency in UK South Asians. This research was conducted using the UK Biobank Resource under application number 15168.

Conflict of Interest

SL-N discloses that she is Research Director of D3-TEX limited which holds the UK and Gulf Corporation Council (GCC) patent for the use of UVB transparent clothing to prevent vitamin D deficiency. All other authors have no conflict of interest.

Reference

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