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Vitamin D status of the African-Caribbean population globally: A Systematic Review and Meta-Analysis

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Vitamin D is unlike any other nutrient, with the majority of the vitamin derived from sunlight rather than food^(1,2). There is a lack of research looking into the vitamin D status of the African-Caribbean population worldwide. This population may be at high risk of vitamin D deficiency because of their darkly pigmented skin that hinders ability to synthesise vitamin D cutaneously, especially in those living at higher latitudes⁽¹⁾. The aim of this study was to investigate the vitamin D status (as measured by 25(OH)D and dietary intake) of the African-Caribbean population globally.

A systematic review was conducted by searching key scientific databases (PUBMED, Web of Science, Scopus) from inception until October 2019. Search terms included 'Vitamin D status' and 'African-Caribbean'. Random and fixed effects meta-analyses were performed by combining means and standard error of the mean. Sub group analysis were performed to assess vitamin D status at high and low latitudes. A sensitivity analysis was conducted, whilst a Pearson's correlation test was run to show the extent that latitude and 25(OH)D were related.

The search yielded 19 papers that included n = 5,270 African-Caribbean individuals from six countries. The meta-analysis found this population to have sufficient (>50nmol/L) 25(OH)D levels at 71.4nmol/L (95% CI 62.8,80) but poor dietary intake of vitamin D at only 3.0µg/day (95% CI 1.67,4.31). For those living at low latitudes 'insufficient' (as defined by the original study authors), 25(OH)D levels were found only in participants with type 2 diabetes and in those undergoing haemodialysis. However, when using our cut-offs (deficiency <25nmol/L, insufficiency >25–50nmol/L and sufficiency >50nmol/L) these participants were considered vitamin D sufficient. In contrast, African Caribbean populations living at high latitudes were found to be vitamin D 'insufficient' to 'deficient' according to original study authors, and insufficient according to our cut-offs. A strong inverse association (Pearson correlation) was found between 25(OH)D status and distance from the equator ($r = -.894$, $p < 0.0001$). Suboptimal dietary vitamin D intake was reported in all studies at high latitudes (intakes < UK recommended nutrient intake of 10µg/day). At lower latitudes, where there are lower recommended dietary intakes (Caribbean recommended dietary intake: 2.5µg/day), two out of three studies reported 'sufficient' intakes.

In African-Caribbean populations, 25(OH)D insufficiency and low dietary vitamin D intake are more prevalent at higher latitudes.

1. Chen TC, Chimeh F, Lu Z *et al.* (2007) *Arch Biochem Biophys* **460**, 2, 213–7
2. Jones G (2008) *Am J Clin Nutr* **88**, 2, 582–600