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Dietary vitamin D supplementation improves haematological status following consumption of an iron-fortified cereal: an 8-week randomised controlled trial

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Abstract
Vitamin D, a secosteroid, has recently been implicated in the stimulation of erythroid precursors and ultimately the rate of erythropoiesis. However, there are a paucity of randomised controlled trials (RCT), investigating the effect of vitamin D supplementation iron status, especially in populations at risk of iron deficiency. An eight-week, double-blind RCT was carried out in 50 female (mean age (± SD): 27 ± 9 years), iron-deficient (plasma ferritin concentration < 20 μg/L) participants, randomised to consume an iron-fortified cereal containing 9 mg of iron, with either a vitamin D supplement (1,500 international units (IU)/day, 38 μg/day) or placebo. The effect of dietary vitamin D supplementation on haematological indicators was investigated. Blood samples were collected at baseline, 4-weeks and 8-week timepoints for measurement of iron and vitamin D status biomarkers. The effect of intervention was analysed with a mixed-model repeated measures ANOVA using IBM SPSS statistical software (Version 21, IBM Corporation, New York, USA). Significant increases were observed in two haematological parameters: haemoglobin concentration and haematocrit level from baseline to post-intervention in the vitamin D group, but not in the placebo group. The increase from baseline to post-intervention in haemoglobin concentration in the vitamin D group (135 ± 11 to 138 ± 10 g/L) was significantly higher than in the placebo group (131 ± 15 to 128 ± 13 g/L) ($P \leq 0.05$). The increase in haematocrit level from baseline to post-intervention was also significantly higher in the vitamin D group (42.0 ± 3.0 to 43.8 49 ± 3.4%) compared to the placebo group (41.2 ± 4.3 to 40.7 ± 3.6%) ($P \leq 0.05$). Despite non-significant changes in plasma ferritin concentration, this study demonstrates that dietary supplementation with 1,500IU vitamin D, consumed daily with an iron-fortified cereal led to improvement in haemoglobin concentration and haematocrit levels in women with low iron stores. Further long-term studies are required, however, these findings suggest a potential role for improvement of vitamin D status as an adjunct therapy for recovery of iron status in iron-deficient populations.

Conflict of Interest
There is no conflict of interest.