



Winter Conference 2023, 5-6 December 2023, Diet and lifestyle strategies for prevention and management of multimorbidity

Association between serum 25-hydroxyvitamin D concentrations and respiratory tract infections requiring hospital admission: analysis of ethnic groups from the UK Biobank cohort

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Vitamin D status has been found to be inversely associated with risk of respiratory tract infections (RTIs)⁽¹⁾. It varies by ethnicity, with several ethnic minority groups in the United Kingdom (UK) reported to be at a higher risk of vitamin D deficiency (serum 25-hydroxyvitamin D (25(OH)D) concentrations <25 nmol/L) compared to their white counterparts^(2, 3). However, the relationship between serum 25(OH)D concentrations and incidence of RTIs by ethnicity in the UK remains unclear. This study aimed to investigate the association between serum 25(OH)D concentrations and likelihood of hospitalisation for RTI in UK ethnic groups.

A nested, case-control study was conducted using data from UK Biobank, which has data for 500k adults for serum 25(OH)D and hospital episodes from linked records. Binary logistic regression models were used to explore the association between serum 25(OH)D concentrations and likelihood of RTIs overall, and by ethnicity.

Of the 36,772 participants included in the analysis, 12,638 (34%) were white Caucasian, 10,311 (28%) Asian, 7,138 (19%) black, 4,034 (11%) other, and 2,651 (7%) of mixed ethnicity. In fully adjusted models, compared to participants with a serum 25(OH)D concentration <15 nmol/L (severe deficiency), those with 25-49 nmol/L, 50-74 nmol/L, and ≥75 nmol/L were found to have statistically significantly lower odds of RTI hospitalisation, with odds ratios (ORs) of 0.53 (95% CI: 0.37, 0.75), 0.61 (95% CI: 0.40, 0.92) and 0.54 (95% CI: 0.30, 0.97), respectively. In the subgroup analysis, ethnic minorities and white individuals with vitamin D deficiency (<25 nmol/L) were more likely to be hospitalised with RTI compared to those that were not deficient, with ORs of 1.36 (95% CI: 1.02, 1.81) and 2.03 (95% CI: 1.30, 3.17), respectively. This association was not statistically significant within ethnic minority subgroups when analysed separately.

Serum 25(OH)D concentrations above 25 nmol/L are associated with lower likelihood of RTI hospitalisation among UK adults. This finding was noted across white and ethnic minority groups, although ethnic minorities with vitamin D deficiency had a lower likelihood of RTIs compared to white individuals. Further studies are warranted to validate these findings and explore the mechanisms underlying the association between vitamin D status and RTIs in different ethnic groups.

Acknowledgements

This project was conducted using the UK Biobank resource under project 15168.

References

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