



The biologic importance of the vitamin D binding protein polymorphism in pediatric COVID-19 patients

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With interest, we read the paper of Bayramoğlu et al. [1], which showed an association between vitamin D deficiency and clinical severity in children and adolescents with COVID-19. Besides the investigated parameters, we would like to highlight the potential influence of vitamin D binding protein (DBP) polymorphism on the reported findings.

Being one of the most abundant serum proteins, DBP transports 85–90% of vitamin D metabolites, whereas 10–15% is more loosely bound to albumin and <0.1% circulates in an unbound form. DBP is characterized by three major alleles, determined by two SNPs (rs7041 and rs4588): DBP1F (rs7041-T/rs4588-C), DBP1S (rs7041-G/rs4588-C), and DBP2 (rs7041-T/rs4588-A), yielding six allelic combinations and corresponding phenotypes: 3 homozygous (DBP1F/1F, DBP 1S/1S, DBP 2/2) and 3 heterozygous (DBP 1F/2, DBP 1F/1S, DBP1S/2) [2]. The *DBP* gene is one of the genes involved in the variation of 25-hydroxy vitamin D (25OHD) concentrations. In several studies with adults and children, minor alleles of rs7041 and rs4588, but also of other *DBP* SNPs (rs2282679 and rs1155563), have been linked with lower 25OHD concentrations [3]. 25OHD and DBP concentrations are highest in DBP1-1, intermediate in DBP1-2, and

lowest in DBP2-2 individuals [2]. In infants, the DBP1S/1S, DBP1S/1F, and DBP1F/1F group showed higher serum 25OHD concentrations from birth onward and a significantly better response to 24-month high-dose supplementation of 30 µg/day vitamin D₃ in comparison with the DBP1S/2, DBP 1F/2, and DBP 2/2 group [3]. Moreover, the DBP1 allele frequency has been associated with a lower prevalence and mortality due to a SARS-CoV-2 infection, which could be partly explained by potential protective effects of vitamin D and DBP (actin scavenging, hemotaxis, influence on T cell response, ...) [4].

In conclusion, the DBP polymorphism could influence the reported vitamin D concentrations in children with COVID-19 and should be taken into account in future studies.

Abbreviations *COVID-19*, Coronavirus disease 2019; *DBP*, Vitamin D binding protein; *SARS-CoV-2*, Severe acute respiratory syndrome coronavirus 2; *25OHD*, 25-Hydroxy vitamin D

Code availability Not applicable

Authors' contributions MMS, RS, and JRD wrote and reviewed the manuscript.

M. M. Speeckaert, R. Speeckaert, and J. R. Delanghe have written the paper.

Data availability Not applicable

Declarations

Conflict of interest The authors declare no competing interests.

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