Role of genetic variants of vitamin D immunomodulation genes in clinical response to treatment of tuberculosis

Sir,

We read with great interest the recently published study\(^1\) on the role of vitamin D on the type and clinical outcome of tuberculosis (TB). The authors did not find any role of baseline vitamin D levels with either the type or clinical outcome but they reported that children with sufficient levels of vitamin D were more likely to have sputum smear conversion at two months than those who did not have sufficient levels. A faster (or higher proportion of patients achieving) sputum smear conversion is an important outcome from the point of view of TB control since even a modest change would significantly alter the risk of transmission of the bacilli within the community.

We wish to point out that host gene polymorphisms for genes involved in vitamin D immunomodulation\(^2\) are a potential clinically relevant factor which needs to be further investigated. The first study\(^3\) which investigated this was from Lima, Peru and reported a faster sputum smear conversion among study participants with TaqI Tt genotype (VDR-vitamin D receptor) compared to those with Taq TT genotype. Another randomized controlled trial\(^4\) has also demonstrated that vitamin D supplementation significantly hastened sputum culture conversion in only the participants with TaqI tt genotype (VDR) (8.09, 95% CI 1.36-48.01; \(p=0.02\))\(^4\). Genome-wide analysis has also underlined the role played by CYP27B1 (1-alpha hydroxylase) as a key mediator of innate immune function and adaptive immunity\(^5\), but this has not yet been clinically studied. Genetic polymorphisms of other genes which are responsible for vitamin D immunomodulation\(^2,5\) like toll-like receptor (TLR), vitamin D binding protein (VDBP) might also be related to therapeutic response to vitamin D supplementation in TB. There is a need to study the role of genetic variants of these genes in studies such as this and it might pave the way for “population stratification” strategies for TB control in future.

We suggest that an ad-hoc analysis on various genetic polymorphisms related to vitamin D immunomodulation mechanism should be undertaken to better understand the clinical relevance of vitamin D as a therapeutic agent for TB.

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References


