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Title: Does vitamin D level influence the size of tuberculin skin test in household contacts with latent TB infection?

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Body: Introduction Vitamin D (25[OH] D) has an immuno-regulatory role in vitro. Recently, a Spanish study has suggested that during the screening for latent tuberculosis (LTB) infection, sufficient 25[OH] D levels prevent positive conversion of tuberculin skin tests (TST). To further investigate the impact of 25[OH] D on TST, in this study we examined the association between the degree of 25 [OH] D insufficiencies and the size of induration during TST. Methods and Results In this retrospective study we reviewed 212 LTB cases from 2009-10. 146/212 cases had both values the 25[OH] D level and the induration size during TST recorded. Only 3% (5/146) of them had normal 25[OH] D levels (> 30ng/ml). 5% (7/146) of LTB patients had insufficient (20-30ng/ml) and 92% (134/146) of them had deficient (<20ng/ml) 25[OH] D levels. The average induration sizes during TST for these three groups were 14.2 ± 3.2 , 18.1 ± 5.4 and 17.2 ± 0.94 respectively. Overall, we found a negative correlation between 25[OH] D levels and induration sizes during TST (Spearman correlation coefficient = -0.2), which was statistically significant ($p = 0.02$). We also found that the average 25[OH]D levels were lower in females than males ($p = 0.01$). However, there was no statistically significant difference in average induration sizes during TST between two genders. Conclusions We found that majority of the LTB patients had low 25[OH] D levels. In general, patients with low 25 [OH] D levels tend to react more strongly during TST. One limitation of our study is that the impact of BCG vaccination was not taken into account. Nevertheless, our study further highlights the impact of 25[OH] D as an immuno-regulator in vivo.