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Title: Does relationship exist between severity of vitamin D deficiency and development of active TB?

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Body: Introduction Deficient serum vitamin D levels have been associated with impaired mycobacterial immunity and incidence of active tuberculosis (TB). However, the significance of level of vitamin D in LTBI and the risk of progression to active disease is less clear. Methods A retrospective review of vitamin D levels of all patients with active TB and LTBI was undertaken between January 2010 and December 2010 at Heart of England NHS foundation trust, Birmingham. We compared vitamin D levels in cases with active and latent TB to explore a relationship between severity of vitamin D deficiency and incidence of active/latent TB. Results 148 cases with LTBI and 113 with active TB were included in the study. 117 out of 148 patients with LTBI and 108 out of 113 active TB cases had a Vitamin D level performed. Median Vitamin D level in patients with TB was 5.7ng/ml (Range 2-46.4). Median Vitamin D level for LTBI was 7.8ng/ml (2-95.30). The difference in Vitamin D levels between latent and active TB cases was statistically significant with P =0.003 (calculated Using Mann Whitney U Test). Subgroup analysis, Median Vitamin D levels of non-white TB and LTBI population were 5.2 (Range 2.00 - 36.20) and 6.5ng/ml (Range 2.00 - 43.40) respectively, P value 0.001. Median Vitamin D levels of white TB and LTBI cases were 17.0 (Range 2.50 - 46.40) and 22.6ng/ml (Range 7.30 - 95.30) respectively, P value 0.25(cohort of white population much smaller than non-white). Conclusions Vitamin D levels were significantly lower in active compared to latent tuberculosis cases suggesting that degree of vitamin D deficiency may influences development of active TB. We feel prospective study is needed to evaluate it further.