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Vitamin D status among pulmonary tuberculosis patients and controls in Tanzania

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Vitamin D may be a determinant of tuberculosis (TB)[(1)], yet the evidence is inconclusive. To assess the role of pulmonary TB (PTB), HIV and acute phase response as predictors of serum 25(OH)D, we conducted a sex- and age-matched cross-sectional study among PTB patients and non-TB controls. The PTB patients were categorised as sputum negative (PTB −) and positive (PTB +) based on culture. For 355 cases, an age- and sex-matched non-TB neighbourhood control was randomly selected. HIV status and serum S-25(OH)D, CRP and AGP were determined. Linear regression analysis was used to assess predictors of S-25(OH)D.

Vitamin D data were available on 97.8% of 1605 participants. Mean (SD) S-25(OH)D was 84.4 (25.6) nmol/l with 39.6% below 75 nmol/l among 346 controls, and 110.9 (35.7) nmol/l and 15.0% among 1223 PTB patients. Time of recruitment, religion, marital status, occupation, PTB and HIV, and elevated S-AGP were predictors of S-25(OH)D, while age, sex, smoking and alcohol intake were not. S-25(OH)D was highest in 2006 compared to subsequent years, and in the first compared to subsequent quarters. PTB patients had 15.4 (95% CI 11.2, 19.7) nmol/l higher S-25(OH)D than controls, and HIV + had 9.1 (95% CI 5.5, 12.7) nmol/l higher levels than HIV patients. As seen in the Table, elevated S-AGP was a positive predictor of S-25(OH)D, and explained most of the difference by PTB, but not HIV, status.

	Model 1			Model 2		
	B	95% CI	P	B	95% CI	P
PTB status						
Non-TB control	—					
PTB −	15.9	10.7, 21,0	<0.001	7.6	1.1, 14.1	0.02
PTB +	15.3	10.9, 19.7	<0.001	4.6	−2.4, 11.6	0.19
HIV status						
HIV −	—			—		
HIV +	9.1	5.5, 12.7	<0.001	7.9	4.3, 11.6	<0.001
Serum AGP (mg/l)						
<1				—		
1–2				11.9	5.6, 18.2	<0.001
2–3				12.5	5.7, 19.2	<0.001
3 +				14.0	6.5, 21.4	<0.001

In conclusion, hypovitaminosis D was common in Tanzania, with considerable secular and seasonal variation. In contrast to previous studies[(2)], PTB and HIV and elevated acute phase response were associated with higher S-25(OH)D. This could be because infections increasing S-25(OH)D, either due increased vitamin D status or to an effect on the validity of S-25(OH)D as a marker of vitamin D status during the acute phase response.

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