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**Title:** Airway bacterial colonization is associated with low vitamin D serum levels in children with cystic fibrosis

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**Body:** Background: Recent studies suggest that vitamin D has significant anti-infective actions. Appropriate 25-hydroxyvitamin D (25OHD) serum level can be linked to enhanced airways' antibacterial mechanisms in cystic fibrosis (CF) patients. Aim: To determine whether 25OHD serum level correlates with airway bacterial colonization in children with CF. Methods: Data were extracted from patients' medical documentation. 25OHD serum level was determined by immunoassay once per year. Chronic airway colonization with *Staphylococcus aureus* (SA) and *Pseudomonas aeruginosa* (PA) was defined by Leeds criteria. Additionally, presence of *Stenotrophomonas maltophilia* (SM), *Acinetobacter baumannii* (AB), methicillin-resistant *Staphylococcus aureus* (MRSA) and *Achromobacter xylosoxidans* (AX) in respiratory samples was assessed. Results: Sixty-one 25OHD serum levels from 27 children (14 males), mean age 7.9 ( $\pm 1.8$ ) years were recorded in a 5-year period. Mean 25OHD serum levels was 79.1 ( $\pm 25.9$ ) nmol/l. Deficiency (level < 75 nmol/l) was present in 49.2 % of cases. No PA chronic colonization was identified, but SA chronic colonization was frequent (90.2%). SA colonized children had lower 25OHD serum levels (76.3 ( $\pm 24.5$ ) vs. 104.8 ( $\pm 29.2$ ) nmol/l,  $P < 0.005$ ). SM colonization was present in 13.1%, AB and AX both in 4.9% of patients, neither was significantly correlated with serum 25OHD levels. Conclusion: Lower serum 25OHD levels are associated with chronic airway SA colonization in CF children. The results emphasize the importance of appropriate vitamin D supplementation in these patients.