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Low serum vitamin D in north Indian multi-drug resistant pulmonary tuberculosis patients: The role of diet and sunlight

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Background: Tuberculosis (TB) and malnutrition are major global health problems with multi-drug resistant (MDR) TB complicating international efforts. The role of vitamin D in susceptibility to and as adjunctive treatment of TB is being studied extensively, though no study has included MDR-TB patients.

Objective: This study set out to estimate vitamin D serum levels and examine their association with dietary intake and sun exposure in patients with MDR-TB.

Methods: North Indian participants were enrolled into three groups: MDR-TB, drug-susceptible pulmonary TB (DS-PTB) and healthy controls. All consenting participants underwent estimation of macro- and micro-nutrient intake and sun exposure using structured questionnaires. Serum biochemistry including 25-hydroxy vitamin D and calcium was measured and correlation between variables determined.

Results: 747 participants were enrolled. Significant difference among the three groups was found in mean serum 25-hydroxy vitamin D levels, body mass index, macronutrient intake, dietary vitamin D and calcium and sun exposure index (SEI). All, except sun exposure (SEI was highest in DS-PTB patients) were found to follow the trend: MDR-TB<DS-PTB<healthy controls. Mean serum vitamin D of all groups indicated deficiency correlating positively with dietary intake and SEI.

Conclusion: This study's novel finding is that MDR-TB patients have lower serum vitamin D concentrations than DS-PTB patients and healthy controls. Dietary intake may be more important than sun exposure in dictating serum levels. Significance of this is uncertain. Further study is required into confirmation of the association, its direction and potential for vitamin D supplementation to treat or prevent MDR-TB infection.

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Multi resistant *Elizabethkingia meningoseptica* infections in tertiary care

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Background: *Elizabethkingia meningoseptica* is a ubiquitous Gram negative bacterium which is paradoxically susceptible to anti-bacterial's for Gram positive bacteria. Though found in diverse environments, it does not constitute human microflora and is an emerging multi resistant pathogen known to cause a multitude of infections especially in immunodeficient hosts.

Results: *Elizabethkingia meningoseptica* was isolated from pleural fluid of a renal allograft recipient, continuous ambulatory peritoneal dialysis fluid in a patient of chronic kidney disease and post-surgery blood cultures in salpingectomy and Mitral valve replacement cases. Coexistent ESBL, AmpC and MBL along with resistance to polymyxins and tigecycline were observed. Paradoxical susceptibility to sulfamethoxazole-trimethoprim (SXT) and cefoperazone-sulbactam facilitated treatment.

Discussion: Multi resistant *Elizabethkingia* infections are known to occur under aggressive Gram negative antimicrobial cover and can be potentially untreatable. Alternative prolonged combination therapy with SXT, rifampicin, quinolones, piperacillin-tazobactam, minocycline, macrolides, clindamycin and novobiocin is dependent on paradoxical susceptibility. Antimicrobial susceptibility testing is difficult as these drugs are neither routinely considered for Gram negative organisms nor they are available in automated system panels. Further, no CLSI guidelines exist for testing and interpretation. Dedicated efforts targeted at early diagnosis and surveillance is required to optimize management and control of *Elizabethkingia* infections.

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