

The role of vitamin D in the pathogenesis and treatment of tuberculosis

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ABSTRACT

Vitamin D was in the pre-antibiotic era used for treatment of tuberculosis (TB) and there is evidence of an important role of vitamin D in the immune response.

The aim of this investigation was to develop a tool to describe clinical outcome of TB, to determine vitamin D serum concentrations in TB patients and controls and to test vitamin D as a possible supplementary treatment. Through two years of field studies at the Bandim Health Project (BHP), a Demographic Surveillance Site in Guinea Bissau, we conducted the following studies:

Study I: We developed a clinical severity score for TB based on the WHO manual for TB and we assessed the score for sensitivity to change during treatment, predictive capacity for later mortality and ability to describe improvement. The TB score showed a high degree of sensitivity to change and predicted subsequent mortality with high accuracy.

Study II: Vitamin D status in 362 TB patients and 494 healthy adults was determined. We found female sex, old age, certain ethnic groups and Moslem faith to be risk factors for low vitamin D status, whereas having no formal schooling was protective. We found overall lower vitamin concentrations among TB patients but severe vitamin D deficiency was surprisingly rare among TB patients, although this was seen in 5% (24/494) of healthy controls.

Study III: We included 365 TB-patients in a randomised double-blind placebo-controlled trial using 100,000 IU cholecalciferol or placebo. The clinical score outcome showed a similar decrease in severity score among vitamin D and placebo treated. No difference in weight gain or time to sputum conversion was found in the two arms. Overall mortality did not differ significantly among the two groups. An analysis stratified for HIV-infected raised the question if vitamin D treated HIV-1 infected TB patients had higher mortality.

In conclusion a new tool for assessment of clinical severity and

prediction of outcome in tuberculosis patients in low-resource settings has been developed; hypovitaminosis D was found more prevalent among TB patients than healthy controls in a West African population but severe deficiency was rare among patients with active TB; and supplementary treatment with high dosages of vitamin D had no general beneficial effect for patients with active TB.