

# Vitamin D Supplementation for Tuberculosis

## Systematic Review and Meta-analysis of Randomised Controlled Trials.

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### Background

Vitamin D has an antimicrobial effect in in-vitro studies<sup>1</sup>. Levels are often deficient in patients with tuberculosis<sup>2</sup>. Vitamin D supplementation may benefit patients receiving treatment for tuberculosis and is a low cost intervention that could be implemented in resource-limited settings.

### Objectives

To assess the impact on mortality and sputum conversion of vitamin D supplementation, compared with placebo or no treatment, for patients receiving treatment for tuberculosis.

### Data Sources

We searched the Cochrane Central Register of Controlled Trials (CENTRAL, published in The Cochrane Library, 2011, Issue 1), Medline from OVID (February 2011), EMBASE (February 2011), International Standard Randomised Controlled Trials Number Register (February 2011) and reference lists of relevant articles.

### Study Eligibility Criteria, Participants, Interventions

Randomised controlled trials of patients receiving treatment for tuberculosis and either vitamin D supplementation or placebo/no treatment were considered eligible. There were no limits on language, publication status or publication date.

### Study Appraisal and Synthesis Methods

Study selection, data extraction and risk of bias assessment were independently performed by two authors. Outcome data from studies with similar outcomes were pooled. Dichotomous outcomes were expressed as risk ratios (RR) and standardised mean differences (SMD) were calculated from continuous variables.

### Results

Four trials were included, comprising 584 participants. There were no significant differences between patients receiving vitamin D supplementation and placebo in terms of mortality (RR 1.18, 95% CI 0.73 to 1.93) and sputum culture positivity at 8 weeks (RR 1.08, 95% CI 0.51 to 2.27). Significantly less patients receiving vitamin D supplementation were sputum smear positive at 6 weeks (RR 0.35, 95% CI 0.15 to 0.82) but the benefit was not sustained at 8 weeks (RR 1.0, 95% CI 0.40 to 2.49) or 5 months (RR 3.0, 95% CI 0.32 to 28).

### Limitations

Two studies were small in size. Allocation concealment was not described in 3 trials. Blinding of healthcare providers and outcome assessors was not described in 2 studies.

### Conclusions and Implications

There is not sufficient evidence currently to demonstrate that administration of vitamin D supplementation benefits patients receiving treatment for tuberculosis. Further trials into this research question are ongoing and should clarify any benefit.

### References

- Liu PT, Stenger S, Li H, et al. Toll-like receptor triggering of a vitamin D-mediated human antimicrobial response. *Science* 2006;311(5768):1770-1773
- Nnoaham KE, Clarke A. Low serum vitamin D levels and tuberculosis: a systematic review and meta-analysis. *Int J Epidemiol* 2008;37:113-9

### Forest Plots of Outcome Comparisons

