

## Stosstherapy in Nutritional Rickets...Mysteries Unveiled

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### Background

High dose Stosstherapy (600000 IU intramuscular vitamin-D) is being used since 1930 to treat nutritional rickets. However, lack of treatment guidelines and inadequacy of studies evaluating it's safety, efficacy and follow-up schedule has led to wrong practices. Physicians give multiple vitamin-D injections using alkaline phosphatase as a surrogate marker, leading to the possibility of vitamin-D toxicity. This along with frequent follow-up biochemical and radiological tests increases the cost of therapy and negates Stosstherapy's main advantage of better compliance.

### Aims & Objectives

To assess the efficacy of high dose Stosstherapy in the treatment of nutritional rickets.

### Material & Methods

A total of 72 cases (33 male, 39 female) with nutritional rickets were given single intramuscular injection of Vitamin D (600000 IU) along with oral calcium (50mg/kg) and Vitamin D (400IU/day) till complete radiological resolution. Radiological scoring was done based on Thacher's 10 point scoring system. Follow-up done at 3 weeks, 6 weeks, 3 months, 6 months, 9 months, and 12 months. Pre and post treatment clinical, biochemical and radiological parameters were compared and analyzed statistically.

### Results

The mean age of presentation was 3 years 5 months (range 6 months – 12 years). Inadequate sunlight exposure (mean 20 minutes/week) and breast feeding more than 6 months (mean 1 year 8 months) were found to increase

the incidence, severity and recovery time in nutritional rickets statistically significantly ( $p < 0.05$ ). Swollen wrist and ankle were the commonest presentation (96%) which started improving by 6 weeks and 80% resolved by 1 year. Angular deformity of the leg was present in 90%. Improvement was noted at 3 months with 60% resolving by 1 year. Initially high alkaline phosphatase was noted in 96%, low 25, hydroxy vitamin-D (calcidiol) in 95%, hypocalcaemia in 70%, hypophosphataemia in 63% cases. 90% achieved normal calcidiol by 3 weeks. At 3 months 90% had normal calcium and phosphate, 100% had normal calcidiol. Normal alkaline phosphatase was noted in 50% by 3 months, 70% by 6 months and by 100% by 9 months. The mean initial radiological score was  $6.8 \pm 3.3$ . 70% cases had radiological resolution by 3 months and 100% by 6 months. Time for radiological resolution and initial radiological score were linearly associated on regression analysis implying that radiologically more severe rickets took a longer time to heal. Distal ulna resolved last marking the completion of radiological resolution in 65% cases. But when initial score was 8 or more or resolution took more than 3 months, distal femur was a better indicator being the last to resolve in 70% cases. All the clinical, biochemical and radiological changes were statistically significant ( $p < 0.05$ ).

### Conclusions

Mega dose of vitamin-D (6,00,000 IU) restores normal calcidiol levels by 3 weeks, hence obviates the need for multiple injections. The results of the study can be used to prognosticate the parents regarding the expected time of resolution. Serial vitamin-D assay is not required at follow-up visits. Rather, alkaline phosphatase and serial radiographs of wrist at 3 monthly intervals can sufficiently monitor the improvement. Breast feeding more than 6 months should be discouraged. This study concludes that high dose stostherapy is safe, effective and ensures compliance in treating nutritional rickets.