

Effectiveness and Safety of Vitamin D3 Supplementation in Children across India: A Retrospective Study

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Abstract : Background: Vitamin D deficiency poses a significant burden on the Indian pediatric population. This observational study aims to evaluate the real-world effectiveness and safety of vitamin D3 supplementation in children. Methods: A retrospective multi-center study was conducted using data from electronic health records spanning 10 years (2014-2024). Pediatric patients aged 0-12 years with documented vitamin D deficiency who were supplemented with vitamin D3 for at least two months were included. Serum vitamin D levels, health improvements using PROMIS Global Physical Health Scale means by Response to Excellent to Poor (global01) Item, and adverse effects were analyzed. Paired t-test was used for data analysis. Results: A sample size of 1,942 participants was included, for which the serum vitamin D levels significantly elevated from 18.01 ng/mL (± 8.73) before supplementation to 35.29 ng/mL (± 13.53) post-supplementation ($p < 0.001$). Participants with poorer baseline health experienced greater elevation in serum vitamin D levels. Improvements were reported in general health (70.64% rated excellent or very good), bone development (58.35% mean improvement), and immunity (62.41% mean improvement). Adverse events were rare (0.21%), and mild, primarily transient gastrointestinal symptoms were reported by most of the participants. Conclusion: Vitamin D3 supplementation successfully corrects deficiency and improves pediatric health outcomes with minimal adverse effects. This study provides essential real-world evidence for its clinical application in India. Future research should focus on randomized controlled trials to validate these findings and assist in developing dosing regimens.

Keywords : cholecalciferol, pediatric health, vitamin D deficiency, real world evidence

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