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## **Hypovitaminosis D and parathyroid hormone response in critically ill children with sepsis: A case-control study**

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**TITLE:** Hypovitaminosis D and parathyroid hormone response in critically ill children with sepsis: A case-control study

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**Abstract**

**Background:** Critically ill Indian children have higher prevalence of vitamin D deficiency. However, there is not much data available on the subgroup with sepsis. It has been reported that there is impaired response of parathyroid hormone (PTH) to vitamin D deficiency in critically ill children and adults. Hence we also sought to analyze the PTH response to vitamin D among the subgroup of critically ill children with sepsis.

**Patients and Methods:** Vitamin D and PTH levels 84 critically ill children with sepsis (cases), and 84 controls were compared between November 2018 and February 2020. Hypovitaminosis D was defined as levels <30ng/mL.

**Results:** The median (IQR) vitamin D for cases was 26 (8.65) ng/mL and that for controls 39.3 (16.55) ng/mL;  $P < 0.001$ . Cases had higher prevalence of hypovitaminosis D as compared to controls (79.7% vs. 9.5%  $P < 0.001$ ). Among the cases, mortality was 24.6% in the 65 children with hypovitaminosis D and 10.5% in those with sufficient vitamin D; the differences were not statistically significant ( $P = 0.339$ ). There were no significant differences in the duration of PICU stay, serum calcium, PTH and disease severity among the aforementioned groups. Out of the 65 children with hypovitaminosis D, only 9 (13.8%) were PTH responders. There were no statistically significant differences in mortality, the PICU stay or disease severity at admission between PTH responders and non-responders.

**Conclusions:** Hypovitaminosis D was more prevalent among critically ill children with sepsis compared to controls. Parathyroid gland response to hypovitaminosis D was impaired in children with sepsis.

**Key words:** vitamin D deficiency, calcium, parathormone, critically ill children