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Vitamin D status in infants during the first 9 months of age and its effect on growth and other biochemical markers: A Prospective Cohort Study

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Background: We planned this prospective cohort study in term newborn babies, with the objective to determine the incidence of vitamin D deficiency in infancy and to determine the level of vitamin D which triggers the physiological PTH axis of the body so as to differentiate truly deficient from sufficient vitamin D status.
Methods: Ninety six participants at birth were enrolled and followed up till 9 months of age. Serum 25OHD was estimated in cord blood at birth and at 14 ± 1 weeks of life. Seventy seven participants were followed up at 9 months for estimation of serum 25OHD, PTH, Alkaline phosphatase (ALP), calcium and phosphorus. Vitamin D deficiency was defined as serum 25OHD <15 ng/ml as per USIOM guidelines.
Results: Serum 25OHD levels at 9 months of age (15.78±8.97ng/ml) were significantly increased in comparison to the level of 3 months of age (14.04±7.10ng/ml) and at birth (8.94±2.24ng/ml). At birth all the participants (77) were deficient in 25OHD levels. It was found that 16/94 (17%) and 19/77 (24.7%) participants at 3 and 9 months of age respectively became vitamin D sufficient without any vitamin D supplementation. There was a significant inverse correlation between serum 25OHD and PTH concentration ($r=-0.522$, $p<0.001$), serum 25OHD and ALP($r=-.501$, $p<0.001$). It was found that reduction in serum vitamin D level to below 10.25 ng/ml results in surge of serum PTH.
Conclusion: Vitamin D deficiency is common from birth to 9 months of age but incidence decreases spontaneously even without supplementation.