

Abstract

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Influence of maternal vitamin D status on infant oral health

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OBJECTIVE: Inadequate maternal 25(OH)D levels during pregnancy may affect primary tooth calcification predisposing enamel hypoplasia (EH), a risk factor for early-childhood-caries (ECC). The purpose of the study was to determine the 25(OH)D status of expectant mothers, the incidence of EH and ECC among their infants and the relationship between prenatal 25(OH)D levels and both EH and ECC.

METHODS: This prospective study recruited participants during pregnancy. A prenatal questionnaire was completed and serum sample drawn for 25(OH)D assay. Infant dental exams were completed at follow-up appointments; EH and ECC were recorded while the parent/caregiver completed a questionnaire. The examiner was blinded to each mother's vitamin D status. EH and ECC were defined by established indices. A p value of ≤ 0.05 denoted significance.

RESULTS: 206 women were enrolled during their second trimester. The mean serum 25(OH)D was 48.1 ± 24.4 nmol/L. 34.5% had levels ≤ 35 nmol/L, a formerly-defined threshold of deficiency. Only 21 women (10.5%) had concentrations ≥ 80 nmol/L, denoting adequacy. Vitamin-D concentrations were related to the frequency of milk consumption and prenatal vitamin use ($p < .001$). 135 infants (55.6% male) were examined at 16.1 ± 7.4 months of age. 21.6% had EH while 33.6% had ECC. Mothers of children with EH had lower but not significantly different mean serum 25(OH)D concentrations during pregnancy than those of children without EH (43.2 vs. 51.4 nmol/L, $p = .07$). However, mothers of children with ECC had significantly lower 25(OH)D levels than those whose children were caries-free (43.9 vs. 52.8 nmol/L, $p = .034$). Infants with EH were significantly more likely to have ECC ($p < .001$).

CONCLUSIONS: This study shows for the first time that maternal vitamin-D levels may have an influence on the primary dentition and the development of ECC.