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ROLE OF CALCIUM AND VITAMIN-D DURING INFANTS TEETH FORMATION

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ABSTRACT

Our pediatric dentists suggests pairing child's (Infants) calcium intake with vitamin D so they can get the most out of foods that are rich in the mineral. Not only will you be keeping infants teeth but their bones as well. Nutrition for children is always an important issue for children in teething age. At this stage children fully need to be supplemented with necessary nutrients, not only calcium rich food but also a verity of other important nutrients. Many parents still wonder that even through they have given a lot of eggs, milk and different nutrition supplements still they have calcium and vitamin D deficiency. In this article we provide the information regarding the importance of calcium and vitamin D supplements during baby teeth formation.

KEYWORDS: Vitamin-D, Calcium, infants, Breastmilk, multivitamin, Multimineral, Vitamin D_3, Vitamin D_2.

INTRODUCTION

Good nutrition during the first 2 years of life is vital for healthy growth and development. Both the breast milk and formula provide all the calcium your baby needs for the first year. An infant need an about 40-50 calories per pound of body weight per day. How often an infants wants to eat will also change over time due to growth spurts which typically occurs at about two weeks and six weeks of age. Exclusive breast feeding is recommended by the world health organization for the first 6 months of your baby's life. A nutritional supplement for children enriched with multivitamins and multimineral that help to enhance immunity and energy levels. It helps to fight infections by boosting immunity an prevent deficiency of vitamins and minerals. All children need vitamin D beginning shortly after birth. Children younger than 12 months old need 400IU of vitamin D each day. Too little vitamin D absorb

calcium and phosphorus. According to the Indian council of medical research in the first year of life, babies need 500mg of calcium per day. From ages to 1 to 9 years the daily requirements of calcium goes up to 600mg. above 10 years of age, boys and girls require 800mg calcium per day.

Vitamin D

Vitamin D is group of fat soluble ketosteroids responsible for increasing absorption of calcium, magnesium and phosphate. It is compounded as vitamin D_3 (Cholecalciferol) and vitamin D_2 (Ergocalciferol). Body produces vitamin D as a response to sun exposure. It is also produced when ultraviolet (UV) rays from sunlight strike the skin and trigger vitamin D synthesis. It is essential for bones, teeth and immune system.

The best biological indicator of body stores of vitamin D from all sources is blood serum concentration of 25-hydroxyvitamin D (25(OH)D). values of 25((OH)D) below a concentration of 30nanimeters per liter(nmol/L) of serum indicate high risk of vitamin D deficiency, whereas healthy concentrations for infants are believed to be at or above 50nmol/L. body stores can decline by 50% over less than a month in infants and thus without source of vitamin D, vitamin D deficiency can rapidly develop. The most accepted approach to building healthy vitamin D is through vitamin D supplementation. Recommended value of vitamin D intakes in infancy are 5 to 10 micrograms per day.

Breastfeed infants

Consumption of human milk alone does not ordinarily enable infants to meet vitamin D requirements, because it provides less than 0.6 to 2.0mcg/L. The vitamin D content human milk is related to the mothers vitamin D status; studies suggest that the breast milk of mother who take daily supplements containing of least 50 mcg (2000 IU) vitamin D_3 have higher levels of the nutrient.

Although UVB exposure can provide vitamin D in infants, the American academy of pediatrics (AAP) advices parents to keep infants younger than 6 months out of direct sunlight, dress them in protective clothing and hats, and apply sunscreen on small areas of exposed skin when sun exposure is unavoidable. The AAP recommends 10mcg (400IU)/day vitamin-D supplements for exclusively and partially breastfed infants starting shortly after birth and lasting until they are consume at least 1000mL/day vitamin D fortified formula or whole milk. The AAP also recommends 10mcg (400 IU) /day supplemental vitamin D for all

infants who are breastfed and ingest less than 1000mL/day vitamin D fortified formula or milk. An analysis of NHANES 2006-2016 data found that only 20.5% of breastfed infants and 31.1% of infants who were not breastfed ingested these recommended amounts of supplements.

The natural source

Vitamin D is both a nutrient we eat and a hormone our bodies make. It is a fat soluble vitamin that has long been known to help the body absorb and retain calcium and phosphorus both are crucial for building bone. Many of the body organs and tissues have receptors for vitamin D, which suggest important roles beyond bone health and scientist are actively investigating other possible functions.

Is there a difference between vitamin D_3 and vitamin D_2 supplements?

If you purchase vitamin -D supplements we can see 2 different forms; vitamin D_2 and vitamin D_3. Vitamin D_2 is made from plants and is formed in fortified foods and supplements. Vitamin D_3 is naturally produced in the human body and is formed in animal foods. There is on going debate whether vitamin D_3 ('cholecalciferol' is better that vitamin D_2 'ergocalciferol' at increasing blood levels of the vitamin. A meta analysis of randomized controlled trials that compared the effect of vitamin D_2 and vitamin D_3 supplements on blood levels found that D_3 supplements on blood levels found that D_3 supplement tended to raise blood concentrations of the vitamin more and sustained those levels longer than D_2. some experts cite vitamin D_3 as the preformed form as it is naturally produced in the body and found in most food that naturally contain vitamin.

Calcium is essential mineral for body functions specially during childhood, when bone and teeth growth are at their peak. Teeth generally composed of minerals, including calcium, rely on a sufficient intake of this mineral to develop properly and maintain their structure integrity.

Teeth forming stages of children

Every baby has 2 stages of teething**.** Baby teething stage: Baby teeth are formed from about 7 to 10 weeks of fetal life. The process of teething different for each child. About 5 to 9 months is the period when children grow 4 middle incisors; from 7 to 11 months grow 4 lateral incisors; next to 18 months grow 4 premolars, from 16 to 24 months 4 canines grow and from 20 to 30 months children grow 4 molars. Thus about 30 months, the child has all 20 teeth in

the jaw. Baby teeth help children chew food, but after while they will loosen on their own, making room for permanent teething stage, this will last forever foe an adult. If lost no replacement for any other teeth. Teething time of children depends on many factors, one of the important factors is nutrition in the fetal stage as well as during child teething, especially in the first 3 years of life.

Calcium contribution in teeth formation

During the teeth enamel formation calcium contributes significantly to the formation of tooth enamel, the outer protective layer of teeth. Enamel provides barrier against bacteria and acids and also first line defense against decay and cavities. Sufficient calcium intake during childhood helps enamels strength and resilience. Calcium also involved in tooth development from prenatal stage through adolescence. Calcium deficiency leads to enamel defects, weak teeth. Calcium plays role in bone density and tooth support. Including bone health, jawbone which supports teeth. Strong jawbone maintain stability of teeth and preventing issues such as tooth loss. Our pediatric dentists believe that recommended daily intake of calcium varies based on age and development stage. Here is the Daily Recommended calcium intake and sources of dietary calcium.

Age group	**Recommended Daily Calcium Intake**	**Sources of Dietary Calcium**
Infants (0 -6 months)	200 milligrams calcium per day	Breast milk or infant formula
Infants (7-12 months)	260 milligrams calcium per day	Breast milk, infant formula, yogurt and some fortified foods
Children (1-3 years)	700 milligrams calcium per day	Milk, yogurt, cheese, leafy greens, greens, fortified foods
Children (4 -8 years)	1000 milligrams of calcium per day	Milk, yogurt, cheese, leafy greens, fortified foods, nuts

Importance of calcium in teeth

Calcium is a mineral and is an indispensable component in composition of bones and teeth, it plays a important role in development of child's body and it participates in neuromuscular transmission and blood clotting. We have Set the child up for a lifetime of strong bones and healthy teeth by having a calcium -rich diet. Calcium is hard mineral that makes builds strong bones also makes enamel that surrounds our teeth the hardest substance in human body. In fact 99% of calcium in the body goes to building healthy bones and teeth. Since 99% of

calcium in body is in teeth and bones, we might think its enough for teeth, but it turns out. Because calcium also necessary for regulating heart rhythms and hormone balance is necessary to stay alive, if there isn't enough calcium for these vital functions from food, the body will take it from anywhere it can get it. Unfortunately, the kids body and our bodies will take calcium from teeth and bones to keep enough for it for other necessary jobs it has in the body. With out enough calcium teeth develop demineralized spots, dull white spots on the teeth that are not strong as regular enamel. These spots are fragile an have a high risk of turning into full cavities.

CONCLUSION

In conclusion optimal levels of vitamin D throughout the pregnancy and childhood may be considered an additional preventive measure for dental caries in the primary and permanent dentation. Sufficient calcium in daily diet is important for healthy maintenance of teeth and gums, it contributes to healthy growth. We need to check , children getting enough calcium in their diet from sources and fluoride toothpaste. Having adequate amount of calcium in your body minimizes the threat of osteoporosis in adulthood. Calcium mainly concentrated in bones and teeth, essential nutrient for baby healthy teeth and it ensures the strength. If there is lack, it will slow down teething, becomes weak and broken when slightly impact. Thus it is necessary to supplement the amount of calcium needed to develop stronger teeth, avoid the phenomenon of teeth growing slowly, fragile teeth, missing teeth.

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