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Original Research

Assessment of vitamin D deficiency as an etiological factor in delayed eruption of primary teeth

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ABSTRACT:
Background: Vitamin D deficiency is a condition that occurs when the body doesn't get enough of the vitamin D it needs to function optimally. The present study was conducted to assess vitamin D deficiency as an etiological factor in delayed eruption of primary teeth. **Materials & Methods:** 74 infants age ranged 12-15 months of both genderswere divided into two groups. Group I consisted of 37subjects with teeth erupted and group II consisted of 37 subjects showing delayed eruption (no tooth in the oral cavity). 2 ml of venous blood was collected in a test tube. The level of vitamin D was estimated using ELISA Kit and correlated with eruption status. **Results:** Group I had 17 males and 20 females and group II had 21 males and 16 females. Age group 12 months had 9 subjects with no deficiency and 10 with deficiency, age group 13 months had 7 with no deficiency and 8 with deficiency, age group 14 months had 11 with no deficiency and 12 with deficiency and 15 months had 8 with no deficiency and 9 with deficiency. The difference was significant ($P< 0.05$). Group I had mean vitamin D level of 32.5 ng/ml and group II had 13.8 ng/ml. The difference was significant ($P< 0.05$). **Conclusion:** A strong association exists between the timing of eruption of primary teeth and Vitamin D deficiency, and it can be concluded that Vitamin D deficiency could be an etiological factor for delayed eruption.
Key words: delayed eruption, primary teeth, Vitamin D deficiency

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INTRODUCTION

The movement of a tooth from its place of development in the alveolar bone to the occlusal plane in the oral cavity is referred to as eruption.[1] Both primary and permanent teeth have a set date for when they will erupt, and variances of six months either side of that date are generally regarded normal for a given child.[2]

Vitamin D deficiency is a condition that occurs when the body doesn't get enough of the vitamin D it needs to function optimally. Vitamin D is essential for various bodily processes, including bone health, immune system function, and maintaining normal cell growth.[3] The primary source of vitamin D is sunlight. People who spend little time outdoors or live in regions with limited sunlight (especially during the winter months) are at a higher risk of

deficiency.Vitamin D is found in some foods, such as fatty fish, fortified dairy products, and certain mushrooms. However, many people don't consume enough of these sources regularly.[4]

Vitamin D has been demonstrated to alter the development of enamel and dentin and is also thought to increase the chance of developing dental caries. However, there isn't much evidence in the scientific literature linking vitamin D insufficiency to delayed tooth emergence.[5]The present study was conducted to assess Vitamin D deficiency as an etiological factor in delayed eruption of primary teeth.

MATERIALS & METHODS

The present study consisted of 74 infants age ranged 12-15 months of both genders. Parents gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. The eruption status (emergence status) of the teeth was recorded. Subjects were divided into two groups. Group I consisted of 37subjects with teeth erupted and group II consisted of 37 subjects showing delayed eruption (no tooth in the oral cavity). 2 ml of venous blood was collected in a test tube. The level of vitamin D was estimated using ELISA Kit and correlated with eruption status.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Status	teeth erupted	delayed eruption
M:F	17:20	21:16

Table I shows that group I had17 males and 20 females and group II had 21 males and 16 females.

Table II Assessment of vitamin D deficiency

Age group (months)	No deficiency	Deficiency	P value
12	9	10	0.72
13	7	8	
14	11	12	
15	8	9	

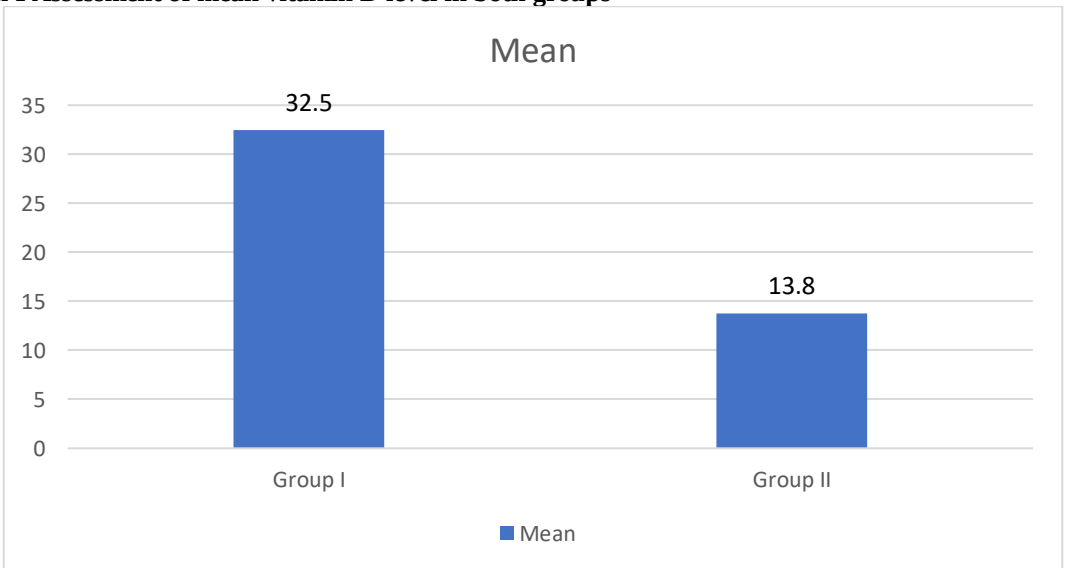
Table II shows that age group 12 months had 9 subjects with no deficiency and 10 with deficiency, age group 13 months had 7 with no deficiency and 8 with deficiency, age group 14 months had 11 with no deficiency and 12 with deficiency and 15 months had 8 with no deficiency and 9 with deficiency. The difference was significant (P< 0.05).

Table III Assessment of mean vitamin D level in both groups

Groups	Mean	P value
Group I	32.5	0.02
Group II	13.8	

Table III, graph I shows that group I had mean vitamin D level of 32.5 ng/ml and group II had 13.8 ng/ml. The difference was significant (P< 0.05).

Graph I Assessment of mean vitamin D level in both groups



DISCUSSION

A steroid hormone known as vitamin D is largely created by exposure to sunlight, though it can also be received from food and dietary supplements.[6] Vitamin D is rarely found in raw foods, but it can be found in fatty fish like herring, mackerel, and salmon, as well as fish oils like cod liver oil. The phrase "vitamin D" refers to both vitamin D2 and vitamin D3.[7] While Vitamin D3 is created in human bodies by exposing 7-dehydrocholesterol from lanolin to ultraviolet light, Vitamin D2 is created by exposing the ergosterol from yeast to ultraviolet light. Vitamin D3 displays the biological processes of cholecalciferol (Vitamin D3). A widely used biomarker for measuring vitamin D levels is the measurement of serum 25-hydroxyvitamin D (25[OH]D).[8]

Vitamin D is a fat-soluble vitamin, and people with obesity may have lower bioavailability of the vitamin due to its sequestration in fat tissue.[9]As people age, their skin becomes less efficient at producing vitamin D, and they may also have reduced dietary intake or absorption.Some health conditions, such as Crohn's disease, celiac disease, and certain liver or kidney disorders, can interfere with vitamin D absorption or metabolism.[10]Certain medications like anticonvulsants, glucocorticoids, and some weight-loss medications can affect vitamin D levels.Vitamin D deficiency may not always cause obvious symptoms, but some common signs include bone and muscle pain, muscle weakness, fatigue or tiredness, frequent infections or difficulty fighting infections and mood changes or depression etc.[11]The present study was conducted to assess Vitamin D deficiency as an etiological factor in delayed eruption of primary teeth.

We found that group I had 17 males and 20 females and group II had 21 males and 16 females. Jairam et al[12] in their study ninety-six infants, aged 12–15 months were selected. Blood samples were assessed for Vitamin D3 levels using the Vitamin D ELISA Kit. The eruption status of the teeth was recorded in all the 96 infants. A significant correlation was found in the Vitamin D levels and the eruption timing ($P < 0.001$). The difference in mean Vitamin D levels among the three socio economic groups was not statistically significant ($P = 0.088$). A significant association was found between the infant's sun exposure and mother's sun exposure during pregnancy and religion on the Vitamin D level.

We observed that age group 12 months had 9 subjects with no deficiency and 10 with deficiency, age group 13 months had 7 with no deficiency and 8 with deficiency, age group 14 months had 11 with no deficiency and 12 with deficiency and 15 months had 8 with no deficiency and 9 with deficiency. We found that group I had mean vitamin D level of 32.5 ng/ml and group II had 13.8 ng/ml. Kohli et al[13]evaluated the effect of feeding practices on timing of eruption of the first primary tooth and found that initiation of soft diet coincided with the eruption of the first tooth. A general pattern of delay was observed.

The limitation the study is small sample size.

CONCLUSION

Authors found that a strong association exists between the timing of eruption of primary teeth and Vitamin D deficiency, and it can be concluded that Vitamin D deficiency could be an etiological factor for delayed eruption.

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