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Frequency of Natal Teeth and Their Association with Maternal and Neonatal Factors

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Abstract

Background: Natal teeth are those teeth which are present at the time of birth. Teeth which erupt within one month after birth are called neonatal teeth.

Objective: To determine the frequency of natal teeth and their association with maternal and neonatal factors.

Materials and Methods: This study was conducted at Orthodontics & Pediatrics Department, Sharif Medical City Hospital (SMCH), Lahore from September 2023 to August 2024 (1 year) after taking permission from Sharif Medical Research Centre (SMRC) and the Ethics Committee of SMDC.

Results: A total of 623 newborns were examined during the study period of 1 year, out of which 7 (1.1%) newborns had natal teeth. Mean maternal age was found to be 25.9±1.9 years. Natal teeth were more commonly found in females (85.7%) as compared to males (14.2%). They were mostly found in the mandibular anterior region. Natal teeth had grade II mobility, and with respect to Helbing's classification, the third category was most commonly found. There was no significant difference in tooth morphology and colour. With respect to maternal factors, there was a significant association with cousin marriage but an insignificant association with parity.

Conclusion: Natal teeth are very rare. Newborns should be examined by a dental specialist soon after birth, and parental counselling should be done regarding the management of natal teeth.

Key words: *Natal teeth, neonatal teeth, maternal age, Helbing's classification*

Introduction

The complex process by which teeth develop from embryonic cells is known as odontogenesis, followed by their growth and eruption in the mouth.[1] Primary teeth commence formation during the 6th and 8th weeks of fetal development, while permanent teeth initiate formation in the 20th week. Teeth will not develop at all if they do not begin to form at or close to these times, leading to hypodontia or anodontia.[2]

Tooth eruption follows a chronology when the tooth erupts into the oral cavity. Many terms have been used to describe teeth that erupt before their normal time, such as congenital teeth, fetal teeth, predeciduous teeth, dentitia praecox, dens connatalis or fetal teeth.[3] According to the definition presented by Massler and Savara, natal teeth are those teeth that are present at the time of birth, and neonatal teeth are those teeth that erupt within the first 30 days of life. They considered the time of eruption as a reference; this definition was widely accepted.[1]

Because of the rare occurrence of natal and neonatal teeth, they are associated with many superstitions among various cultures.[4] Some people believed that children born with teeth are favoured by fate, while others considered it a bad omen. In Poland, India and Africa, these superstitions are very common.[5] Native Africans believed that a child born with teeth not only brought disaster to oneself but also to anybody whom it came into contact with, so the children born with teeth are shortly killed after they are born. Chinese consider a baby born with teeth as an ill omen, and that baby will bring misfortune. In England it is believed a baby born with teeth would grow into a famous soldier. [5]

The incidence of natal teeth has been estimated to be 1:1000 and 1:3000 births. Natal teeth are more common compared to neonatal teeth. There is no difference in prevalence between males and females. But according to literature, there is a 2:1 ratio, which is 66% proportion for females against a 31% proportion for males.[6] Neonatal/natal teeth most commonly occur in the mandibular region of central incisors (85%), and it is consistent with the normal order of eruption of primary teeth, followed by maxillary incisors (11%), mandibular cuspids or molars (3%) and then maxillary cuspids or molars (1%). Natal and neonatal teeth may vary in size, shape or colour, from conical to normal shape and from yellowish to opaque colour.[3]

Even though the precise aetiology of the presence of natal and neonatal teeth is still unknown.[5] It may be associated with several factors, such as the superficial position of germs, infection or malnutrition, osteoblastic activity occurring in the area of the tooth germs, febrile conditions or pollutants such as poly-

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chlorinated biphenyls (PCBs), dibenzofurans (PCDFs) and polychlorinated dibenzo-p-dioxins (PCDDs). Literature suggested that these pollutants have the capacity to cross the placenta.[7] Natal teeth may be associated with many syndromes such as Wiedeman-Rautenstrauch (neonatal progeria), Pierre-Robin syndrome, Down's syndrome, Ellis-van Creveld syndrome (chondroectodermal dysplasia), Hallermann-Streiff syndrome (oculomandibulo-dyscephaly with hypotrichosis), pachyonychia congenita or Jadassohn-lewandowski syndrome.[8] Natal and neonatal teeth may also be found in association with developmental anomalies such as cleft lip and cleft palate.[9]

Natal and neonatal teeth can be categorized using Helbing's classification based on their clinical characteristics.[7] Helbing classified natal teeth into 4 categories, from the 1st category of solid shell-shaped crowns to 4th category of palpable teeth with visible mucosal swelling. Natal teeth may be associated with complications like traumatic ulceration of the tongue (Riga-Fede disease), feeding problems and aspiration because of hypermobility. To avoid these complications, a complete oral examination should be done for each newborn baby for early diagnosis and treatment.[10]

The aim of this study was to find the frequency of natal teeth and its association with neonatal and maternal factors. Any complication associated with it and possible treatment options were also explored.[11] The precise etiology of natal teeth is unknown, and there is limited research available in Pakistan on this topic at the regional level. Therefore, the rationale of this study was to identify this rare problem in neonates as early as possible after birth and provide awareness to their parents regarding timely diagnosis and treatment in order to reduce the risks associated with it.

Material and Methods

This cross-sectional study was conducted from September 2023 to August 2024 at the Department of Paediatrics and Neonatology, Sharif Medical City Hospital (SMCH), Lahore, after getting permission from the Ethics Committee of Sharif Medical Research Centre and Sharif Medical and Dental College, Lahore **(SMDC/SMRC/163-21)** The inclusion criteria involved all neonates, irrespective of gender, born at SMCH during the duration of the study (1 year). Any stillbirth and parents not consenting to participate in the study were excluded.

Data collection procedure:

Written informed consent was taken from the parent(s) of each neonate. A predesigned proforma was filled out by the primary researcher after thorough intraoral examination of every newborn to check for the presence of neonatal teeth. The proforma included questions about:

Maternal factors:

1. Age of mother
2. Parity
3. Positive family history
4. Medical history/medications taken during pregnancy
5. Cousin marriage

Neonatal factors:

1. Gender of neonate
2. Birth weight
3. Site of natal tooth
4. Mobility of tooth
5. Helbing's classification
6. Shape of natal tooth
7. Colour of natal tooth
8. Other findings, such as dentofacial anomalies

Data analysis procedure:

The data was analysed using SPSS (Statistical Package for Social Sciences) for Windows version 25. Quantitative variables like maternal and neonatal age were represented as mean and SD. Qualitative variables like presence of natal teeth, neonatal gender, jaw, site, side, mobility, and Helbing's classification were presented as frequency and percentage. A t-test was applied to determine the association of natal teeth with maternal age. A chi-square test was applied to determine the association of natal teeth with gender, jaw, site, side, mobility, Helbing's classification, parity and cousin marriage. P-value <0.05 was considered to be statistically significant.

Results

In this study, a total of 623 newborns were examined intraorally during the study period of 1 year, out of which only 7 (1.1%) newborns had natal teeth. The average birth weight of newborns with natal teeth was found to be 3.05±0.28 kg. Mean maternal age was found to be 25.9±1.9 years. Data showed that 6 out of 7 newborns with natal teeth were female (85.7%), as shown in figure 1. The association between natal teeth and maternal age, cousin marriage and parity is shown in Table 1. Frequency and percentage of qualitative variables like jaw, site and side of natal teeth, percentage of mobility and helbing's classification of natal teeth are shown in table 2. The association between neonatal gender and natal teeth in the jaw, their site, side, mobility and Helbing's classification is shown in Table 3. Data showed negative family history in all cases and insignificant maternal medical history.

Discussion

Human teeth normally erupt after six months of life, but the presence of natal and neonatal teeth causes anxiety in mothers and families. [13] The cause of early eruption of teeth is unknown, but there are several associated factors such as malnutrition, febrile status, infection, hormonal stimulation, and syndromes such as Hallerman-Streiff, Ellis-Van Creveld, Craniofacial dysostosis, Multiple Steacystoma, Congenital Pachyonychia and Soto's Syndrome.[6] A study by Bulut et al.[3] suggested that premature eruption of natal teeth is

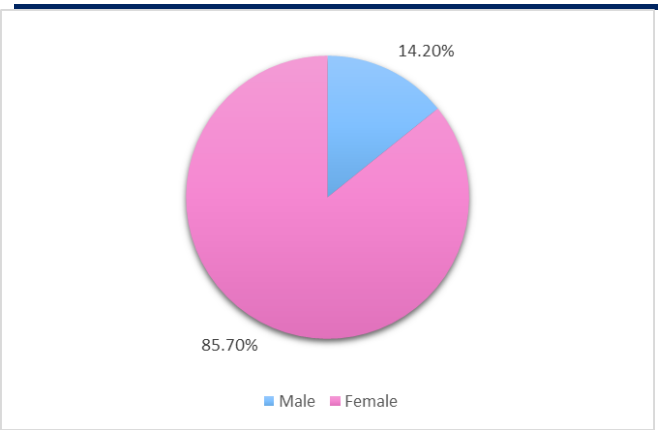

Figure 1. Gender distribution of newborns with natal teeth

Table 1. Association of Natal Teeth with Maternal Factors

Natal teeth	Maternal age (years)		Cousin Marriage		Parity
	Mean	SD	Frequency	Percent-age	Mode
	25.9	1.9	5	71.4%	2.00
p-value	0.008*		0.172		0.002*

Table 2a. Association between Natal teeth and Jaw, Site, Side

Natal teeth	Jaw			Site			Side		
	Maxilla	Mandi-ble	p-value	Anterior	Posterior	p-value	Right	Left	p-value
Frequency	02	05	.000*	06	01	.000*	04	03	.000*
Percentage	28.6	71.4		85.7	14.3		57.1	42.9	
Total	07			07			07		

Table 2b. Association between Natal teeth and Mobility & Helbing's Classification

Natal teeth	Mobility of natal teeth				Helbing's Classification				
	Grade I	Grade II	Grade III	p-value	Class I	Class II	Class III	Class IV	p-value
Frequency	01	05	01	.000*	00	01	04	02	.000*
Percentage	14.3	71.4	14.3		0.0	14.3	57.1	28.6	
Total	07				07				

Table 3a. Association between Neonatal gender and Natal teeth in Jaw, Site & Side

Neonatal Gender	Natal teeth in Jaw			Natal teeth Site			Natal teeth Side		
	Maxilla	Mandible	p-value	Anterior	Posterior	p-value	Right	Left	p-value
Male	00	01	0.328	01	00	0.352	01	00	0.296
Female	02	04		05	01		03	03	
Total	07			07			07		

Table 3b. Association between Neonatal gender and Mobility & Helbing's Classification

Neonatal Gender	Mobility of natal teeth				Helbing's Classification				
	Grade I	Grade II	Grade III	p-value	Class I	Class II	Class III	Class IV	p-value
Male	00	01	00	0.527	00	00	00	01	0.324
Female	01	04	01		00	01	04	01	
Total	07				07				

related to superior position. The incidence of natal and neonatal teeth has been documented in literature by many authors in their local domains. Natal teeth are more prevalent than neonatal teeth. One study by Mirza et al. has shown that natal teeth are common. [8] One study from southern Punjab by Zafar et al. [13] shows that the frequency of natal and neonatal teeth was 0.18%, which is quite less than the 1.1% frequency shown in the current study. Another study from India by Yen et al. [6] shows the presence of 4 natal teeth over a period of 7 months, which is similar to our study in which 7 natal teeth were found over a 1-year study period. In our study, natal teeth were common in females (85.7%) as compared to males (14.2%), while the majority of studies report an absence of gender predilection. Some other Pakistani studies, by Mirza et al.[8] and Zafar et al.[13] have shown female predominance of natal teeth, which is similar to our study.

When assessing the location of erupted teeth, natal teeth are more commonly found in the mandible (0.8%) than the maxilla (0.3%) and show a significant difference between both jaws. They are commonly found in the anterior region (1.0%), then the posterior region (0.2%) and on the right side (0.6%) and then the left side (0.5%) and show significant differences. A study conducted in Turkish population by Bulut et al. [6] shows that natal teeth erupted in the mandibular anterior region and most were found in the left region, which is not similar to our study. In a case report, it is stated that the most common localization of natal and neonatal teeth is the mandibular region of central incisors (85%).[7] The local distribution of teeth is in the area of maxillary incisors (11%), mandibular canines and molars (3%), and maxillary canines and molars (1%). Teeth that erupt first in the mouth are lower incisors; it is expected that natal teeth are usually lower incisors.[15]

In our study, mobility of teeth was also assessed and graded as grade I, II and III. Most commonly, grade II mobility (71.4%) and then grade I and grade III (14.3%) were found in natal teeth, showing a statistically significant difference. In another study conducted in the Turkish population, mobility was assessed, and grade II mobility was found, which is similar to our study.[6] Natal and neonatal teeth can be categorized using Helbing's classification based on their clinical characteristics. The first category includes a shell-shaped crown poorly fixed to the alveolus by gingival tissue and the absence of a root. The second category contains a solid crown poorly fixed to the alveolus by the gingival tissue and little or no root. The third category consists of the eruption of the incisal margin of the crown through gingival tissue. Lastly, the fourth category is formed by edema of gingival tissue with an unerupted but palpable tooth.[7] In our study, the third category (57.1%) was commonly found, then the fourth (28.6%) and second (14.3%) categories, with significant differences. A case report by Portela et al describes a newborn with eleven natal teeth. In the present study, the majority of tooth crowns were of normal shape (1.3%) as compared to conical (0.2%), which is similar to a study by Bulut et al.[6] Another study by Basavanthappa et al.[16] and Leung et al.[17] showed that natal teeth are conical.

In our study, the association between natal teeth and cousin marriage was found to be statistically significant (p=0.17). In the present study, natal teeth are commonly found in mothers with an age range of 25 to 26 years, which shows a significant difference. Out of 7 babies with natal teeth, 5 were born to parents who had cousin marriage, showing a significant difference, which shows there is a genetic correlation between the presence of natal teeth. A study conducted by Rajeswari et al.[18,19] shows that cousin marriage is considered a significant factor in the transmission of congenital defects and several autosomal recessive diseases from one generation to another with an increased risk of side effects in offspring. There are chances of nutritional deficiencies in newborns resulting in failure to gain weight.

There are various treatment options available for natal teeth. We should follow a conservative approach which involves applying topical anaesthesia cream and extraction of natal teeth. It is done to avoid trauma to oral tissue, the mother's breast and aspiration of the tooth. This study was carried out to determine the occurrence of natal teeth, with the aim to create awareness among the Pakistani population. Pakistan is still a developing country with a low literacy rate. The social and cultural taboo associated with natal teeth and other developmental anomalies also needs to be addressed.

Limitations

It was a single centered study, done on a sample of population from Lahore, Punjab region of Pakistan. The sample size was also limited, therefore, further large-scale research needs to be done for more reliable and generalized results.

Conclusion

Natal teeth is a benign condition of the oral cavity with an occurrence of 1.1%. Natal teeth were commonly found in females and in the anterior mandibular region. They most commonly exhibited grade II mobility and the third category with respect to Helbing's classification. There was no significant difference in tooth morphology, colour, and parity. Regarding maternal factors, natal teeth were commonly found in mothers with an age range of 25 to 26 years, and there was a significant association between cousin marriage and natal teeth.

CONFLICT OF INTEREST: None

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Author Contributions

1. **Faiza Malik:** Conceptualization, study design, data analysis, final approval.
2. **Fiza Khan:** Data Collection and Data Analysis, Interpretation of Results and Drafting.
3. **Nosheen Iftikhar**: Data Analysis, Interpretation of Results.
4. **Allah Nawaz Sultan:** Data Collection , Interpretation of Results .
5. **Farooq Khan:** Drafting.
6. **Hooria Haq:** Data Collection.