Developmental Dental Disorders and Tongue Lesions in Pediatrics of Western India: A Prevalence Study

Jitender Solanki1, Sarika Gupta2, Ravinder Singh3, Rajesh Vyas3 and Jitendra Khetan4

1Department of Public Health Dentistry, Vyas Dental College and Hospital, Jodhpur, Rajasthan, India
2Department of Oral Medicine & Radiology, Vyas Dental College and Hospital, Jodhpur, Rajasthan, India
3Department of Prosthodontics, King Khalid University, Saudi Arabia
4Department of Prosthodontics, Vyas Dental College and Hospital, Jodhpur, Rajasthan, India

Corresponding author: Jitender solanki, Department of Public Health Dentistry, Vyas Dental College and Hospital, jodhpur, rajasthan, India, Tel: 91-9571580558; E-mail: solankijitender@gmail.com

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Objective: There is an increase in the frequency of occurrence of Developmental dental Anomalies of oral cavity in all populations. The study was carried out to find the Prevalence of developmental dental anomalies and to assess of oral health status of children up to 15 years of age.

Methods: A cross-sectional study was carried out among total of 6000 children which comprised of equal males and females (3000 each). Clinical assessment of oral cavity was done for the presence of any developmental disorder in the children. Demographic information was recorded for each subject: age, gender, and education for study subjects and the occupation and income of their parents, on a structured profoma. The data collected was than tabulated and subjected to descriptive statistics.

Results: Out of total study subjects 1731 (28.8%) had developmental dental anomalies whereas 4269 (71.2%) had no anomalies. Developmental dental anomalies was seen in (27.8%) of males and 29.8% of females. Tongue disorders were seen in 480 (8%) of the subjects, among them the prevalence of coated tongue was 265 (55%).

Conclusions: Parents of children with developmental anomalies should be educated about the type and cause of anomaly and they should even be motivated to get the possible treatment done for the same.

Keywords: Developmental disorder; Disorder; Syndrome; Anomalies; Nutritional factors

Introduction

The evaluation of patients with multiple congenital anomalies (MCAs) is of critical importance because. All unbalanced autosomal chromosomal aberrations and most gene mutations and teratogens produce syndromes. Therefore, MCAs are sensitive indicators of germlinal mutagens and teratogens [1]. The delineation of an MCA entity facilitates a better understanding of the phenotypic spectrum, prognosis, and origin of the condition. The latter may be of great importance in genetic counseling or to detect new teratogenic agents [1]. Gene mapping efforts for some of these conditions might become feasible after the identification of informative families. Epidemiological studies have suggested an increase in the frequency of occurrence of Developmental dental Anomalies [DDA] of oral cavity in all populations, thus underlining their clinical significance and public health importance [2,3]. The risk of DDA is related to social factors [4-6], nutritional problems [5,6], excessive exposure to fluoride and infectious diseases [4,5,7], occurring during the pre- and postnatal period of amelogenesis. However, the exact mechanism and etiological factors are not fully understood [8]. Previous studies have shown that maternal ingestion of chemicals such as fluorides, tetracycline and thalidomide are associated with higher prevalence of DDA [4,9]. The above evidence suggests that Developmental Anomalies of mouth are important risk factors for various dental problems both in the primary as well as the permanent dentition, so this study was carried out to find the Prevalence of developmental dental anomalies of children up to 15 years of age.

Material and Methods

The present study was carried out in the villages around Jodhpur city by the department of Public Health Dentistry, Vyas dental college and hospital during the camps that were conducted in these two years. Total 66 camps were conducted in the span of two years in rural areas of Jodhpur tehsil. Jodhpur is the second largest district in Rajasthan with 7 Tehsils. According to census 2011, the total rural population of Jodhpur is 2,39,796 consisting of 1,24,432 males and 1,15,364 females. The target populations for our study were the children of rural areas of the age group of 5, 12 and 15 years. Uncooperative subjects and those whose parents were not willing were excluded from the study. A total of 6000 children were taken that comprised of equal males and females (3000 each). Calibration: The oral examination of all the subjects was carried out by 2 examiners who were trained and calibrated in the Department.
of public health Dentistry. Training took 2 days, with further 2-3 days for calibration. The inter-examiner variability was tested and the weighted kappa statistic was (.80). Examination and data collection: A cross sectional study was carried out. Children were made to sit on a comfortable chair or in the lap of their mother in a well illuminated airy room. Clinical examination was done using mouth mirror and WHO probe. Clinical assessment of oral cavity was done for the presence of any developmental disorder in the children. Demographic information was recorded for each subject: age, gender, and education for study subjects and the occupation and income of their parents, on a structured proforma. This was completed by the recorder during the clinical examination. Information was obtained from school authorities for children who could not provide the information.

Statistical analysis All the data was collected and calculations for each clinical parameter were done. The data collected was then tabulated and subjected to descriptive statistics.

| Age groups | Number of patients | Mesiodens | Peglateral | Hypoplasia | Talons cusp |
|------------|--------------------|-----------|------------|------------|-------------|
| 5 years    | 2000               | 0         | 0          | 34         | 0           |
| 12 years   | 2000               | 179       | 104        | 196        | 64          |
| 15 years   | 2000               | 290       | 158        | 586        | 120         |
| Total      | 6000               | 469       | 262        | 816        | 184         |

Table 1: Prevalence of Developmental Dental Anomalies (28.8%)  
Developmental dental anomalies was seen in (27.8%) of males in which hypoplasia was seen in 396 (47.4%) followed by mesiodens 221 (26.4%) and talons cusp was seen only in 10.0% of the subjects (Table 2).

| Age groups | Number of patients | Mesiodens | Peglateral | Hypoplasia | Talons cusp |
|------------|--------------------|-----------|------------|------------|-------------|
| 5 years    | 1000               | 0         | 0          | 18         | 0           |
| 12 years   | 1000               | 87        | 48         | 94         | 28          |
| 15 years   | 1000               | 134       | 86         | 284        | 56          |
| Total      | 3000               | 221       | 134        | 396        | 84          |

Table 2: Developmental Dental Anomalies in males (27.8%)  
Among the female participants, developmental dental anomalies were seen in (29.8%) of females. Hypoplasia was seen in 420 (46.8%), mesiodens in 248 (27.6%) and talons cusp in 100 (11.1%) subjects.

| Age groups | Number of patients | Mesiodens | Peglateral | Hypoplasia | Talons cusp |
|------------|--------------------|-----------|------------|------------|-------------|
| 5 years    | 1000               | 0         | 0          | 16         | 0           |
| 12 years   | 1000               | 92        | 56         | 102        | 36          |
| 15 years   | 1000               | 156       | 72         | 302        | 64          |
| Total      | 3000               | 248       | 128        | 420 (46.8%)| 100 (11.1%)|

Table 3: Developmental Dental Anomalies in Females (29.8%)  
Result  
A cross sectional study was carried out to assess the prevalence of developmental anomalies of oral cavity in rural children of Jodhpur city. The study comprised of 6000 school going children, with equal number of males and females. Out of total study subjects 1731 (28.8%) had developmental dental anomalies whereas 4269 (71.2%) had no anomalies. Among the subjects with dental anomalies, Talons cusp was seen in only 184 (10.6%) of the subjects whereas hypoplasia was seen in 816 (47.1%). Hypoplasia was the only anomaly seen in 5 year children 34 (Table 1).
Discussion

Early detection of developmental dental anomalies (DDA) can lead to better treatment outcomes for the patients. This could be done by thorough history of the lesion and good diagnostic ability of the dental practitioner. Studies considering the prevalence and covariates of DDA vary considerably with respect to characteristics of the populations investigated, measurement aspects and study design utilized [10]. In our study the prevalence of DDA was seen to be 28.8% which is in accordance with other studies which reported that the prevalence range’s between 24% and 49% [11,12]. Out of the total practitioner, Studies considering the prevalence and covariates of DDA, hypoplasia was observed in 47.1% children. Whereas Seow et al. [10] and Robles et al. [12] reported a prevalence of 25% and 40.2% respectively. This variation could be due to the varying level of fluoride in drinking water of these places. The present study reported a great variation in prevalence of hypoplasia from a study conducted by Nayak et al. [13] in population of western India who has reported a prevalence of 23.6% in school going children. This variation highlights the higher level of fluoride in drinking water in rural areas. Other than this, under nutrition and childhood infections during the period of tooth development are also said to be associated with enamel defects in socioeconomically underprivileged communities [6].

Mesiodens was the only supernumerary teeth seen in the present study. Studies have reported a prevalence of 0.1-3.8% with a male to female ratio of 2:1 [13,14]. In the present study the prevalence of mesiodens was found to be 27.09%, which was much higher. Also, no sexual predominance was observed. Previous studies have reported the prevalence of peg lateral in the range of 0.33% to1.51% [13,15,16] as compared to prevalence of 15.1% in the present study. These differences could be attributed to racial and ethnic difference between populations and the effects of genetics, development and environmental effects on the development of dentition. Talon’s cusp was seen in 10.6% of total population studied which is in harmony with studies who have reported a prevalence of 0.04-10% [13,17].

In the present study, the prevalence of lesions associated with tongue in children was 8%, which supports the findings of other studies who have reported a prevalence ranging from 4.95% to 35.11% [18-21]. Not many studies have been carried out to assess the prevalence of coated tongue since it has been considered as a pseudo pathological condition. This condition has been studied in the present study because as reported by Garcia & al there is a statistically significant relationship between its presence and dento-alveolar fistulae [22]. Coated tongue was seen in maximum number of children (55%). Whereas Madera et al. [23] reported a prevalence of 74.6%. This difference could be attributed to the larger sample size and difference in type of population studied. In the present study, fissured tongue was seen in 15% of the children which lies in the range of 0.9% to 44.8% as observed in other studies [18-21,24]. Studies have reported the prevalence of ankyloglossia in pediatrics ranges from 1.3% to 8.1% [18,19,20,24]. On the contrary, in the present study the prevalence was much higher 12%. A chromosomal locus has been identified for some familially expressed examples of ankyloglossia but it is unlikely that the same locus is involved in all cases [25]. In the present study macroglossia was seen in 7.9% patients which is again much higher than reported by other studies [18,19,24]. This could be attributed to the hereditary factors in the study population. The prevalence of cleft tongue in the present study was 2.9%, which is higher than that studied by previous studies [18]. This difference could be due to the larger population size in the present study and difference in type of population studied. The prevalence of geographic tongue in the previous studies [19-21] is in concordance with that seen in the present study 6.25%. The prevalence of hairy tongue has been reported in the range of 0.2% to 0.8%. Similar observations were made in our study 0.6%.

The difference in prevalence of tongue lesions in the present study as compared to other studies could be a result of comparatively very large sample size, difference in type of population studied in terms of races, socio economic factors, nutritional factors, etc.

Conclusion

The type of population studied in the present study has varied greatly from the other populations when compared in terms of genetics and environmental factors. Therefore, the results have varied hugely. Parents of these children should be educated about the type and cause of anomaly and they should even be motivated to get the possible treatment done for the same.

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