



TITLE: Prevalence Of Dental Agenesis In A Nepalese Subpopulation: A Radiographic Study

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ABSTRACT: In day to day practice, dentist encounter number of congenital dental anomalies. These dental anomalies can be broadly classified on the basis of size, shape, number and position. Tooth agenesis or hypodontia is one such commonly encountered dental anomaly. It is defined as the congenitally missing tooth/teeth reduction in overall decrease in the total number. The aim of this study was to evaluate the prevalence of tooth agenesis in a Nepalese sub-population using panoramic radiographs. The results revealed that this anomaly was present in 7.9 % of the total sample size. The anomaly was equally distributed in between the both genders. 48 (60%) subjects were present with a single congenitally missing tooth, 24 (30%) were present with two congenitally missing teeth and remaining 8 (10%) subjects were present with three or more than three congenitally missing teeth. The persisting literature related to the prevalence rate of tooth/teeth agenesis in other population based studies ranged in between 0.03%-25.7%. The study concluded that the difference in the prevalence rate of the present study and the other studies is might be because of the sample selection, method of the study and area of patient selection, which suggest racial and genetic differences.

Keywords: Tooth agenesis, dental anomaly, hypodontia, panoramic radiographs

I. INTRODUCTION

In day to day practice, dentist encounter number of congenital dental anomalies. These dental anomalies are result of disturbances during various stages of tooth development including initiation, morpho-differentiation or cyto-differentiation. These dental anomalies can be broadly classified on the basis of size, shape, number and position. Their presence and degree of expression determines the genetic and phylogenic differences among the subjects of same or different populations.¹

Tooth agenesis or hypodontia is one such commonly encountered dental anomaly. It is defined as the congenitally missing tooth/teeth reduction in overall decrease in the total number. Genes like AXIN2, MSX1, WNT 10 A, LTBP3, PAX9 are found to be responsible for tooth agenesis. It can be classified into true anodontia and true partial anodontia (Hypodontia/oligodontia). This anomaly can be associated with a single or multiple tooth. Third molars are the most common associated tooth with tooth agenesis followed by second premolars and lateral incisors. Tooth agenesis can also be associated with the syndromes like Witkop tooth-nail syndrome, Fried syndrome, Book syndrome or Down syndrome.^{2,3}

The persisting literature showed that the prevalence rate of tooth/teeth agenesis in different population based studies ranged in between 0.03%-25.7%.² To the best of our knowledge, negligible or no literature is available till date regarding the prevalence of tooth agenesis in the Nepalese population. Hence, this study was conducted to evaluate the prevalence of tooth agenesis in a Nepalese sub-population using panoramic radiographs.

II. MATERIAL AND METHODS

The study was conducted after receiving ethical clearance from Institutional Review Committee. Panoramic radiographs of pre-orthodontic patients were selected from the database of the Department of Oral Radiology, Dhulikhel hospital (Nepal). The radiographs of the patients with history of trauma, extraction or syndrome were not included in the study. A total of 1045 panoramic radiographs were selected for the study out of which 1015 radiographs (male: 361; female: 654) met the inclusion criteria. Descriptive analysis was done to determine the distribution of the tooth agenesis in the given population.



Table 1: Prevalence characteristics of the tooth agenesis seen in the present study

Total subjects with anomaly (n)	Gender		Tooth involved (N)	Prevalence in ascending order	Distribution		Number of abnormal teeth in single subject		
	Male (n%)	Female (n%)			Unilateral (N%)	Bilateral (N%)	One (n%)	Two (n%)	Three more (n%)
80	40 (50%)	40 (50%)	131	12>22>35>14>24>23>25=32>13=45>15=34>11>43=44=21=33>42	103 (78.6%)	28 (21.4%)	48 (60%)	24 (30%)	8 (10%)

III. RESULTS

The results revealed that this anomaly was present in 7.9 % of the total sample size. The anomaly was equally distributed in between the both genders. 48 (60%) subjects were present with a single congenitally missing tooth, 24 (30%) were present with two congenitally missing teeth and remaining 8 (10%) subjects were present with three or more than three congenitally missing teeth. Out of the total teeth with the dental anomalies, 131 (15.5%) teeth were present with this dental anomaly. 103 (78.6%) of these teeth were missing unilaterally while remaining 28 (21.4%) were present bilaterally. The results showed that the most common congenitally missing tooth was right maxillary lateral incisor whereas, the least common was right mandibular lateral incisor. The prevalence characteristics of the dental anomaly is summarized in Table 1.

IV. DISCUSSION:

The persisting literature related to the prevalence rate of tooth/teeth agenesis in other population based studies ranged in between 0.03% - 25.7%. A study aimed to check the incidence of tooth agenesis in Indian subcontinent to be 0.03% which was the least in contrast to the present studies. A different study from same region involved sample size of 5000, in age group 3-15, showed a prevalence rate of 0.1%. A Turkish population study showed the incidence rate of 0.5%. In Western and Southern Asian population, it was reported to be 1.7% and 1.9% respectively. A study of young adults of age 17-21 showed the prevalence rate to be 2% in Saudi population aged between 4-12 years and, in another study, done in Israeli population prevalence rate was 2.6%. Also,

a eastern Asian population study presented the same result of 2.6%, with a sample size of 725 in mean age of 12 years. A South American study showed the incidence rate of tooth agenesis to be 4.48%. A Middle Eastern study comprising of 1000 sample size indicated incident rate of 5.2%. A 2013 Portuguese study showed the prevalence rate of 6.1%. In Brazilian individuals it was 6.28%, and 6.8% in Pakistani inhabitants. Out of all the studies, Sudanese study with sample size of 1225 demonstrated 8 % incident rate. A study from Thailand showed the prevalence rate of 13.2%. An Indian study which included 600 individuals, of age 12-30, indicated a prevalence rate of 13.4%. An Australian population of 1050 individual aged 6-13 years of age showed incidence rate of 14.3%. A study in Middle Eastern population it was 15.4%. In 1047 Brazilian population showed 15.7% incident rate, an Iranian population showed 17.2%, A 2018 Western Asian population established frequency of 20.2%. A prevalence rate of 22.8% was perceived in 425 Middle Eastern population. In 2012 Saudi population the prevalence rate was 25.7%, aged 12-30, this was one of the studies that had the highest incidence rate.⁴⁻¹⁰

V. CONCLUSION:

The comparison of the present study results with the previous studies in the literature revealed that tooth agenesis is one of the most common dental anomaly encountered by the dentist. The difference in the prevalence rate of the present study and the other studies is might be because of the sample selection, method of the study and area of patient selection, which suggest racial and genetic differences.



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