

Agenesis and Malformation of maxillary lateral incisors in Saudi Arabian Female Students

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Abstract

This study was carried out to determine the prevalence of congenital absence (agenesis) and malformation of maxillary lateral incisors in Saudi Arabian female students. A group of one thousand five hundred (1500) Saudi female school students, with an age range (11-19 years) were randomly selected from governmental and private schools in different districts at Jeddah city. Clinical and radiographic examinations were performed. The findings indicated that agenesis of maxillary upper lateral incisors were present in 0.7%. Tooth malformations mainly peg shaped lateral incisors were observed in about 2 % of the sample.

Introduction

The frequencies of developmental hypodontia and dental anomalies of permanent teeth vary from country to country and among races. Knowledge about these frequencies are essential in assessing the causes and resources required (1).

Hypodontia (excluding the third molar) is relatively common findings in different populations. Its frequency varies from 2.3 to 8% (5, 13). Maxillary lateral incisors were the second most commonly absent teeth as reported by several authors (Claton, 1956 (2); Glenn 1964 (3); Ingervall *et al.*, 1972 (4); Wisth *et al.*, 1974 (5); Rolling, 1980(6)). Muller *et al.*, 1970 (7), found that in those people with missing one tooth, the maxillary lateral incisors are congenitally absent in 46.4 % of U.S.A. subjects. Magnusson *TE.*, 1977 (8), found that agenesis of maxillary lateral incisor was present in 18% after examining 1116 Icelandic students.

Peg-shaped maxillary lateral incisor is a common finding among developmental malformed teeth. It was reported by Clayton 1956 (2) as being present in 0.3 % of U.S. subjects, while Thilander and Myrberg 1973 (9) found 0.6% of the same anomaly in Swedish schoolchildren. Magnusson *TE.*, 1977 (8), reported that peg-shaped maxillary lateral incisor to be more common in boys 1.3% against 3% in girls of the Icelandic sample.

In Saudi Arabia, the prevalence of hypodontia and peg-shaped maxillary lateral incisors were studied by Al-Emran *et al.* 1990 (10), in 500 Saudi Arabia male students within the age range 13-14 years, he reported that agenesis of maxillary lateral incisor was present 0.6%. Whereas, deviation from normal dental morphology (peg-shaped) maxillary lateral incisor was observed in 4% of the sample.

Salama and Abdel-Megid, 1994 (11), conducted a study on the prevalence of agenesis and peg-shaped maxillary lateral incisors in 1300 Saudi Arabia male students. They found that agenesis of maxillary lateral incisor was present in 9 %. Peg-shaped maxillary lateral incisor was found in 0.7 % of the total sample size.

Both of the previous studies were done in the Central Region, (Riyadh city), and further studies in the eastern region are needed to confirm their findings

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The purpose of this investigation is to determine the prevalence of congenital absence (agenesis) and malformation (peg-shaped) maxillary lateral incisor among Saudi school female students in the city of Jeddah (the Eastern Region of Saudi Arabia) and to compare the data with other similar studies.

Material and method

This investigation comprised of one thousand five hundred (1500) Saudi female school students, within an age range (11-19 years). They were randomly selected from governmental and private schools in different districts of Jeddah city. Socio-economic differentiation of the sample was not attempted.

All students attending on the day of examination were examined. Inclusion criteria were as follows:

1. No previous orthodontic treatment.
2. No previous history of maxillary lateral incisor extraction.
3. No previous restorative reshaping or crowning of the maxillary lateral incisors
4. Saudi Arabian origin

The clinical examination was carried out in the school in good daylight using disposable tongue depressors to retract the lips if needed during anterior segment examination.

The students were questioned about possible earlier extractions and those with positive history were excluded from the study. If the lateral incisors were missing and the student has no positive history of previous extraction, the student was referred to the college of dentistry in Jeddah for diagnostic panoramic radiograph to be taken.

Agenesis of lateral incisor was determined from radiograph; students with impacted maxillary lateral incisors were also excluded from the study.

Malformation (peg-shaped) or deviation from normal tooth morphology of the maxillary lateral incisors was recorded at the clinical examination.

Two orthodontic examiners examined all the participants; one of them is the author. Previous calibrations on the malformation (peg-shaped) tooth morphology of maxillary lateral incisors were done before the field examination as a part of quality control analysis.

Results

Figure (2) presents, the percentage distribution of normal, agenesis and peg shaped maxillary lateral incisor values among the 1500 Female students. 1477 (98.3%) of the sample had normal lateral incisors, 20 (2%) had peg shaped maxillary lateral incisor, and the least common were congenital absence (agenesis) maxillary lateral incisors about only 3 (0.7%).

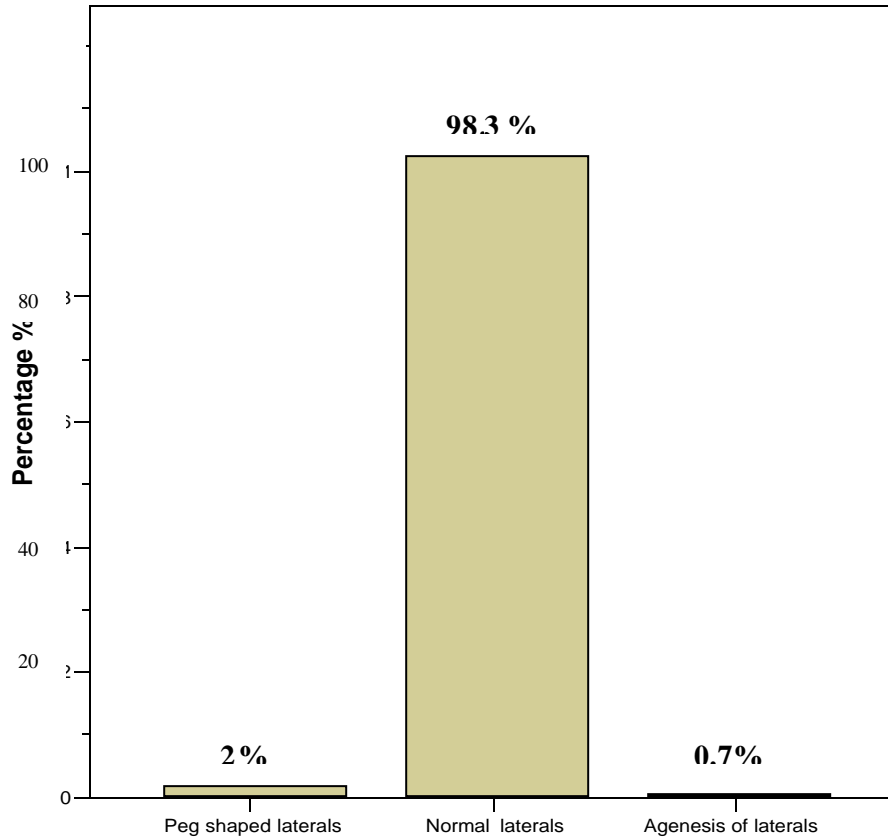


Figure 2

Percentage distribution of normal, agenesis and peg shaped maxillary lateral incisors for 1500 female students

Comparison table of the percentage distribution between the present study and similar studies done in other parts of Saudi Arabia is presented in Table (1). The present study shows similar prevalence pattern distribution of agenesis and peg-shaped maxillary lateral incisors as *Al-Emran et al.* study and different results compared to *Salama et al.* study.

Authors	Year	City	No. subjects	Subjects age	% Agenesis of MLI	% Peg-shaped of MLI
Al-Emran et al.	1990	Riyadh	500	13.5 -14.5 years	0.6%	4%
Salama et al.	1994	Riyadh	1'300	5 - 10 years	2.6%	0.7%
Al-Humayani F. (present study)	2003	Jeddah	1'500	11 -19 years	0.7%	2%

Table 1

Percentage distribution of studies on agenesis and peg-shaped maxillary lateral incisors in Saudi Arabia population

Discussion

The number of patients seeking orthodontic treatment in Saudi Arabia has increased markedly during recent years. Therefore it is important to have relevant epidemiological data on different types of malocclusion in order to estimate the total need for treatment. (12)

In the present study, analysis of a large sample was done in order to obtain a clear and valid picture of the distribution pattern of congenital absence (agenesis) and malformation (peg-shaped) of maxillary lateral incisor in the Eastern region of Saudi Arabia.

This study shows a low incidence of agenesis of maxillary lateral incisors, which is in agreement with the investigators that have done similar studies in Saudi Arabia (10 and 11) Table (1). The present study confirms the findings of *Al-Emran et al.* and the study of *Salama et al.*, that the majority of Saudis have low incidence of agenesis of maxillary lateral incisor.

However, other investigators have reported different incidence in other populations, such as the United State population (2 and 7), the German population (4 and 5) the Iceland population (8), and the Swedish population (9). All the investigators showed higher incidence that varies from 2.3 to 18%. The most likely explanation is that the subjects of the Saudi Arabian samples are of different racial and ethnic origin, subjects in Saudi sample are of Basic Mediterranean race compared to subjects in other population that are of Caucasians race.

There is a considerable evidence that genetic factors are involved, *Grahnen, 1956* (3) in family study has demonstrated that possibly in the majority of cases, agenesis of teeth may be genetically determined, but that aspect is beyond the scope of this study.

In the present study the prevalence of peg-shaped maxillary lateral incisors are (2%), it is lower but not far from the prevalence reported by *Al-Emran et al.* (4%). However, this observation differs from the findings of *Salama et al.*, who showed in their study a very low prevalence of peg-shaped maxillary lateral incisors (0.7%). This could be because the examined students in the study of *Salama et al.* were mostly very young and their permanent maxillary lateral incisors were not yet erupted

Other investigators in other populations (United State, German, Iceland, and Swedish populations) had also reported a lower incidence of peg-shaped maxillary lateral incisors with prevalence that varies from 0.3 to 1.3 % (2, 4, 5, 7, 8, and 9).

The prevalence pattern of agenesis and peg-shaped maxillary lateral incisors in this study indicates that agenesis of maxillary laterals were less common than the peg-shaped maxillary lateral incisors Figure (1). The same prevalence pattern was observed by *Al-Emran et al.* (10). However, a different prevalence pattern was reported by *Salama et al.* (11). Results of *Salama et al.* of the peg shaped laterals cannot be compared to the present study or to *Al-Emran et al.* study, because most of the examined subjects in the study of *Salama et al.* were young with unerupted permanent maxillary lateral incisors.

Investigators in other populations (United State, German, Iceland, and Swedish populations) reported also different prevalence pattern of agenesis and peg-shaped maxillary lateral incisors. This indicates that differences do exist between various populations. The most likely expansion is the differences in racial and ethnic origin.

Another reason could be due to the variation in sampling techniques and criteria used. Further exploration to help explain this apparent difference in the prevalence pattern is needed.

Conclusion

The conclusion that can be drawn from this study is that the prevalence of congenital absence (agenesis) of maxillary lateral incisors are low compared to the malformation (peg shaped) maxillary lateral incisors in Saudi Arabian female students.

The present study also shows that Saudis have more prevalent peg shaped maxillary incisors and less agenesis maxillary lateral incisors than Caucasians.

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