Dental anomalies associated with malocclusion among 13 year old Kurdish students

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ABSTRACT

Background: The aim of this national oral health survey was to determine the prevalence of malocclusions due to some anomalies in the dentition among the 13 years old Kurdish students in sulaimani intermediate school.

Materials and methods: The total sample was 950 (455 males and 495 females) which assessed by diagnostic set and special instrument. The clinical examination was mainly based on the definitions of Björk et al. Some variables were recorded as present or absent sometimes denoting the tooth or the teeth involved in malocclusion and their distribution according to the whole sample.

Results: The results showed that 1)The most common extracted tooth was the mandibular first molar (2.9%). 2) At this age group the most common partially erupted tooth was the maxillary canine (4.2%). 3) The most common unerupted tooth was the maxillary second molars. 4) The most common retained deciduous tooth was the maxillary canine (6.8%), then the maxillary second molars (5.4%).5) Hypodontia as judged clinically was found in 2.1% of the sample affecting one or more permanent teeth. The most common congenitally missing tooth was the maxillary lateral incisor (0.9%), mandibular second premolars (0.4%), and then maxillary second premolar (0.2%). 6) 29.2 % of the sample had one or more rotated teeth. The most common rotated tooth was the mandibular second premolars (5.3%). 7). The sample showed 30.4% with one or more displaced teeth. The most common displaced tooth was the maxillary lateral incisor (8.8%), then the maxillary canine (7.2%).

Conclusion: At the age of 13 both males and females show large range of dental anomalies that are better to be controlled.

Keywords: Anomalies, sulaimani, hypodontia, congenitally, deciduous. (J Bagh Coll Dentistry 2013; 25(2):173-178).

INTRODUCTION

Sulaimani lies in the northern mountainous part of Iraq. The main language of the inhabitant people is Kurdish. The total population of Sulaimani City is about 601,705 of whom 13,274 are 13 years of age. Few orthodontic researches have been conducted in this part of Iraq. While dental caries has been regarded as the major dental disease throughout the world, malocclusion is a close runner-up. The morphogenetic nature of most malocclusions assures us that this dento-facial problem will continue to demand the best that dentistry can offer for a long time, indeed [1].

Clearly, there is a need for further epidemiological research aiming to increase the knowledge about the extent of demand for orthodontic treatment [2], therefore, it is of prime importance in diagnosis and treatment planning in Orthodontics or for the development of any national preventive plan for malocclusion.

A thorough investigation of the occurrence of these malocclusions among school children would be of major importance in the planning of orthodontic treatment in the Public Dental Health Service. This study was not designed to be carried out on subjects who are still in a mixed dentition stage of development because of the dynamic nature of the mixed dentition stage and because many problems of occlusion in that stage of development are self-correcting [3].

It is likewise important to carry out a comparison of the prevalence of malocclusion with different racial groups on an objective basis, since the information they would provide might well throw light on the causes of malocclusion [4].

The few studies which have been published have dealt with selected sub-populations and it is therefore not known whether the results may be generalized to the total population. Clearly, there is a need for further epidemiological research aiming to increase the knowledge about the prevalence and type of malocclusion as well as the extent of need and demand for orthodontic treatment [2].

Although the dental services in Iraq have been in continuous development both in type of the service given and in the size and distribution of the service supplied [5], but studies devoted to identify the malocclusion problem in the Iraqi population have been quite few [6,7].

This study was designed to include a sample of (950) of one age group (13 year olds) selected by multi-stage sampling similar to [8,9] who performed an oral health National study in Iraq.

MATERIALS AND METHODS

1. The Sample

This study was designed to include a sample of (950) of one age group (13 year olds) in sulaimani intermediate school selected by multi-stage sampling

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2. Instruments and Equipment

The following instruments and supplies were used:
1. Plane mouth mirrors
2. Millimeter graded vernier (Inox, Zurcher Modell, Dentaurum 042-751).
3. Metric ruler
4. An instrument designed to measure tooth rotation and displacement modified from [10] and [4]. It is 6.5 cm long and consists of two stainless steel rods of 1mm in diameter with rounded ends, and 15° angle between them.

3. Method

Examination Area:

The students examined were seated in a chair with a high backrest with their head supported in an upright position and the examiner standing in front of the chair [3, 11].

Clinical Examination:

Anomalies in the dentition:

These observations were assessments of the status of individual teeth. Each tooth (and tooth space) is assessed for the conditions listed. Relevant questions to the student may often be helpful in making differential diagnosis within this category of conditions [3]. It involves:

A. Anomalies of eruption and development

By the age of 13 years most of the students should have a full set of permanent teeth except for the third molars.

1. Missing permanent teeth due to extraction or trauma (Code: E):

All missing permanent teeth were registered, even if a bridge or partial denture had replaced them. The presence of spacing, the contour of the underlying alveolar ridge, the caries-experience of present teeth and pertinent questions to the student usually allow a correct assessment of missing teeth due to extraction or trauma [3].

2. Unerupted teeth (Code: X):

All unerupted permanent teeth, other than third molars, were registered. Considering the students' age canines and second molars might have not yet erupted and were recorded. Other missing teeth were distinguished from congenitally absent teeth and missing due to extraction and trauma [4].

3. Partially erupted teeth (Code: P):

A partially erupted tooth was considered as a tooth that had not reached the occlusal level.

4. Retained deciduous teeth (Code: D):

Any present deciduous teeth were recorded, whether the successor permanent tooth had erupted or not.

5. Congenitally absent teeth:

Considering the student's chronological and dental ages, those teeth that were assessed to be congenitally absent were entered under remarks. When the student gave a history of no previous extraction(s), and the contour of the underlying alveolar ridge did not indicate an impacted tooth, it was assumed that the tooth was congenitally absent [3].

It was possible that missing teeth were mistaken for congenitally absent teeth in the absence of radiographic examination and vice versa, but only one of these items was registered. In case of doubt the entry was made under 'missing tooth' and under 'remarks' [4].

B. Anomalies of alignment

1. Rotated teeth

Fully erupted teeth that were rotated more than 15° were registered under 'mesial' or 'distal' rotation. The degree of rotation was measured with the registration instrument [4].

2. Displaced teeth

Any tooth displaced bodily from the ideal arch line by more than 1mm was registered under 'buccal' or 'palatal' displacement [10].

RESULTS

Anomalies in the dentition

1. Missing permanent teeth due to extraction or trauma:

Of the sample, 6.8% had one or more missing permanent teeth due to extraction or trauma. The most common extracted tooth was the mandibular first molar (2.9%), then the maxillary first molar (1.0%) (Table 1).

Table 1: Distribution of missing permanent teeth due to extraction or trauma of the whole sample.

Side		Right							Left						
Tooth No.		◄7	◄6	◄5	◄4	◄3	◄2	◄1	1►	2►	3►	4►	5►	6►	7►
Maxillary	n	0	11	0	0	0	0	0	1	0	0	0	0	90	1
	%	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.9	0.1
Mandibular	n	0	29	1	0	0	0	0	0	0	0	1	2	27	1
	%	0.0	3.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.8	0.1

2. Partially erupted teeth

The most common partially erupted tooth was the maxillary canine (4.2%), then the maxillary second molars (2.3%), mandibular second molars (1.9%),and then maxillary second premolars (1.6%) (Table 2).

Table 2: Distribution of partially erupted teeth of the whole sample.

Side		Right							Left						
Tooth No.		◄7	◄6	◄5	◄4	◄3	◄2	◄1	1►	2►	3►	4►	5►	6►	7►
Maxillary	n	28	0	16	9	31	1	0	1	0	51	11	14	0	17
	%	2.9	0.0	1.7	0.9	3.2	0.1	0.0	0.1	0.0	5.3	1.1	1.5	0.0	1.8
Mandibular	n	15	0	5	7	8	1	0	1	0	4	6	10	0	21
	%	1.6	0.0	0.5	0.7	0.8	0.1	0.0	0.1	0.0	0.4	0.6	1.0	0.0	2.2

3. Unerupted teeth

The most common unerupted tooth was the maxillary second molars (10%), then the mandibular second molars (4.7%), maxillary canine (1.4%) ,and mandibular second premolars (1.2%) (Table 3).

Table 3: Distribution of still unerupted teeth of the whole sample.

Side		Right							Left						
Tooth No.		◄7	◄6	◄5	◄4	◄3	◄2	◄1	1►	2►	3►	4►	5►	6►	7►
Maxillary	n	96	0	8	0	15	0	0	0	0	12	0	4	1	95
	%	10.1	0.0	0.8	0.0	1.6	0.0	0.0	0.0	0.0	1.2	0.0	0.4	0.1	10.0
Mandibular	n	51	0	12	1	1	0	0	0	0	1	2	11	1	39
	%	5.3	0.0	1.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.1	0.1	4.1

4. Retained deciduous teeth:

Of the sample 27.3% had retained deciduous teeth. The most common retained deciduous tooth was the maxillary canine (6.8%), then the maxillary second molars (5.4%), mandibular second molars (2.4%), and then both maxillary first molars (0.9%) with mandibular canines (0.9%) (Table 4).

Table 4: Distribution of retained deciduous teeth of the whole sample.

Side		Right					Left				
Tooth No.		◄E	◄D	◄C	◄B	◄A	A►	B►	C►	D►	E►
Maxillary	n	52	11	68	0	0	0	0	62	7	50
	%	5.5	1.1	7.1	0.0	0.0	0.0	0.0	6.5	0.7	5.3
Mandibular	n	30	8	6	0	0	0	1	10	3	17
	%	3.1	0.8	0.6	0.0	0.0	0.0	0.1	1.0	0.3	1.8

5. Congenitally absent teeth:

Hypodontia as judged clinically was found in 2.1% of the sample affecting one or more permanent teeth. The most common congenitally missing tooth was the maxillary lateral incisor (0.9%), mandibular second premolars (0.4%), and then maxillary second premolar (0.2%) (Table 5).

6. Rotated teeth:

Of the sample, 26.5 % were found to have one or more rotated teeth. The most common rotated tooth was the mandibular second premolars (5.3%), then mandibular canine (5.1%), maxillary canine (4.5%), and mandibular first premolars (2.8%) but the least rotated tooth was maxillary second premolars (0.5%) (Table 6).

Table 5: Distribution of congenitally missing teeth of the whole sample

Side			Right				Left				
Tooth No.		◄5	◄4	◄3	◄2	◄1	1►	2►	3►	4►	5►
Maxillary	n	1	1	0	8	0	0	11	0	2	3
	%	0.1	0.1	0.0	0.8	0.0	0.0	1.1	0.0	0.2	0.3
Mandibular	n	5	1	0	0	0	1	1	0	0	3
	%	0.5	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3

* These numbers are of only the teeth that were surely congenitally missing by clinical examination and history.

Table 6: Distribution of rotated teeth of the whole sample.

Side			Right				Left				
Tooth No.		◄5	◄4	◄3	◄2	◄1	1►	2►	3►	4►	5►
Maxillary	n	4	9	48	21	19	20	23	38	8	6
	%	0.4	0.9	5.0	2.2	2.0	2.1	2.4	4.0	0.8	0.6
Mandibular	n	47	30	48	13	10	9	21	51	25	55
	%	4.9	3.1	5.0	1.4	1.0	0.9	2.2	5.3	2.6	5.7

7. Displaced teeth:

Of the sample, 28.6% were found to have one or more displaced teeth. The most common displaced tooth was the maxillary lateral incisor (9.8%) then the maxillary canine (7.5%), mandibular canine (3.7%), and mandibular laterals (2.3%), while the least commonly displaced teeth were the maxillary first premolars (0.3%), maxillary second premolars (0.6%), maxillary central incisors (0.9%) and both the mandibular first premolar and the mandibular central incisor (1.1%) (Table 7).

Table 7: Distribution of buccally and palatally displaced teeth of the whole sample.

Direction of displacement	Side		Right					Left				
	Tooth No.		◄5	◄4	◄3	◄2	◄1	1►	2►	3►	4►	5►
Buccal	**Maxillary**	n	0	2	65	49	7	4	46	62	2	1
		%	0.0	0.2	6.8	5.1	0.7	0.4	4.8	6.5	0.2	0.1
	Mandibular	n	8	7	30	10	9	11	3	25	9	7
		%	0.8	0.7	3.1	1.0	0.9	1.1	0.3	2.6	0.9	0.7
Palatal	**Maxillary**	n	6	0	7	45	5	2	47	9	3	6
		%	0.6	0.0	0.7	4.7	0.5	0.2	4.9	0.9	0.3	0.6
	Mandibular	n	12	0	6	20	1	2	12	9	5	14
		%	1.2	0.0	0.6	2.1	0.1	0.2	1.2	0.9	0.5	1.5
Total	**Maxillary**	n	6	2	72	94	12	6	93	71	5	7
		%	0.6	0.2	7.6	9.9	1.2	0.6	9.8	7.4	0.5	0.7
	Mandibular	n	20	7	36	30	10	13	15	34	14	21
		%	2.1	0.7	3.8	3.1	1.0	1.3	1.6	3.6	1.5	2.2

DISCUSSION
Anomalies in the dentition:
A. Anomalies of eruption and development:

In the present study, 6.8% of the sample had one or more missing teeth due to extraction or trauma. This was near to 6% of [12], 6% of the 13 year old sample of [13] and 7.3% of [9], while it was much lower than 9.8% of [14] and 10% of the 13 year old sample of [7].

The most common extracted tooth was the mandibular first molar (2.9%), then the maxillary first molar (1.0%). This is in near to the findings of [15,16,9].

Cons et al [17] found that 3.22% of their 15-18 year old sample had one or more retained deciduous teeth mostly involving single teeth. This was much lower than that found in this study (27.3%) because of the older age of the former study.

The most common retained deciduous tooth was the maxillary canine and then the deciduous second molars. This may be because of their late eruption time and the high congenital absence of the second premolars as found by [18] which was 2% for the mandibular and 1.1% for the maxillary.

Hypodontia was found in 2.1% of the present sample and it was low when compared to the 5% found by[19] among orthodontic patients or the 3.36% found by [18]among the Medical Technology Institute students, while near to the findings of [9].

The most common congenitally missing tooth was the maxillary lateral incisor, then the mandibular second premolar, maxillary second premolar. This finding disagrees with those of [20 21 22 23 24 25266 18] who found the mandibular second premolar to be the most prevalent followed the maxillary lateral incisor. On the other hand, our finding comes in coincidence with that of [27 28 29 30 31 32 19 9].

Anomalies of alignment:
A. Rotated teeth:

In this study, 26.5 % had one or more rotated teeth (>15°). This prevalence was lower than that found by [10 7 13 33 34], while near to[9]. It is difficult to compare our result with those of many other previous studies because of differences in the definition and criteria used.

The most common rotated tooth were the mandibular second premolars then mandibular canine, and maxillary canine which were in reverse to the readings of [9] that showed mandibular canine as the most common rotated tooth then the mandibular second premolar.

B. Displaced teeth:

In this study 28.6% had one or more displaced teeth (>1mm). This prevalence was remarkably more than the 14.5% and 13.5% found by [7 13] in their 13 year old samples. This finding is also higher than that found by [10] and this may be explained by differences in definition and criteria used as [10] recorded only displacements more than 1.5mm.The findings near to that of [9] that had the same criteria of the sample.

The most common buccally displaced tooth was the maxillary canine (6.8% on the right and 6.5% on the left sides) that near to the findings of [9] while it was lower than the finding of [35] who examined 2851 Iraqi 13-14 year olds to find that 8.3% of them had one or two buccally malposed canines.

The most common palatally displaced tooth was the maxillary lateral incisor (4.7% on the right and 4.9% on the left sides). This is due to the developmental position of the maxillary lateral incisor germ palatal to the roots of the central incisors [36]. The results were also near to [9].

The conclusions from this study were:
1. 6.8% of the sample had one or more missing permanent teeth due to extraction or trauma.
2. Hypodontia was found in 2.1% of the sample affecting one or more permanent teeth.
3. From the whole sample 26.5 % were found to have one or more rotated teeth. The most common rotated tooth was the mandibular second premolars, while the displaced teeth were in 28.6% that have one or more displaced teeth. The most common displaced tooth was the maxillary lateral incisor
4. At the age of 13 both males and females show large range of dental anomalies that are better to be controlled.

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