

Prevalence of Malocclusion Among School Going Children In Gujarat

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ABSTRACT

Background: Malocclusion is any deviation from normal occlusion of teeth. The goal of the orthodontic treatment is to attain optimal occlusion within framework of function, stability and aesthetics. As a result, patients who seek orthodontic treatment are concerned with improving their appearance and social acceptance, often more than they are with improving their oral function or health. Enhancing these aspects of quality of life is an important motive for undergoing orthodontic treatment. There is no study of such kind to evaluate the pattern of malocclusion in Gujarat population.

Aim: The aim of the study was to analyse and to provide quantitative information on the pattern of dental malocclusion among orthodontic population in Gujarat.

Material and method: Schools were randomly selected among Gujarat. Random samples of 20,000 children aged 12-16 years old attending these schools. Before start of the study, an ethical clearance was obtained from the Ethical Clearance Committee of Ahmedabad dental college & hospital, Gandhinagar. School authorities and parents of sampled children were notified about purpose of the study. Clean sets of mouth mirror and probes were used to examine the samples.

Results: Angle's Class I malocclusion was found to be the most common malocclusion with 61.91 % followed by 27.69 % Angle's class II and 10.39 % Angle's class III. Increased Overjet was the most common problem, followed by increased Crowding, deep bite and spacing in that order.

Conclusion: Epidemiological evaluations of dental diseases, such as malocclusion, are a prerequisite for systematic planning of preventive and therapeutic measures for confronting such problems and for assessing the current traits regarding orthodontic treatment in a particular population. The study was directed toward the achievement of these goals.

Keywords: Prevalence, Malocclusion, school children.

INTRODUCTION

Since antiquity, occlusion has been the foci of interest for almost every specialty of dentistry. It has remained the most debated and challenging yet imperative and indispensable aspect of dental

science. Millions of individuals worldwide are suffering from oro-dental problems in spite of most of them being preventable. Malocclusion is one of them. Malocclusion is not a disease but a

Received: Oct. 5, 2020; Accepted: Dec. 11, 2020

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morphological variation which may or may not be associated with pathological conditions. Malocclusion is one of the most prevalent oral pathologies, next only to dental caries and periodontal disease and usually ranked third among worldwide public health dental disease priorities. Developing countries like India are struggling to eradicate many medical and dental diseases. The main reason behind this is an inadequate implementation of preventive oral health care programmes which need a sound base of epidemiological data. Epidemiological studies on occlusion and malocclusion not only help in orthodontic treatment planning and evaluation of dental health services but also offer a valid research tool for ascertaining the operation of distinct environmental and genetic factors in the aetiology of malocclusion.

Facial appearance has a long lasting implication on an individual. An unacceptable dental appearance has often been associated with a negative effect on self-image, career advancement and peer-group acceptance. In order to prevent a wide-spread impact on their psychological development, children having very severe or handicapping malocclusion should be identified and corrective measures should be instituted at the earliest.

Dental malocclusion is present in all societies but its prevalence varies in different parts of the world among various populations. Ethnic, genetic and environmental factors lead to development of malocclusion. Many epidemiological studies have been conducted to determine the prevalence of malocclusion in different racial and ethnic groups with variable results.

MATERIAL AND METHOD

Schools were randomly selected among gujarat. Random samples of 20,000 children aged 12-16 years old attending these schools. Before start of the study, an ethical clearance was obtained from the Ethical Clearance Committee of ahmedabad dental college & hospital,gandhinagar. School authorities and parents of sampled children were notified about purpose of the study. Clean sets of mouth mirror and probes were used to examine the samples. Mouth mirrors and probes were cleaned using 5% Savlon antiseptic solution (5ml of savlon in 95ml of water) provided by college. Details of

student's name, age, sex were recorded. Clinical findings were noted.

Inclusion Criteria

- 1.12 to 16 years school going children
2. only permanent dentition

Exclusion Criteria

1. radiographs, photographs and study models are not taken
2. missing first molar excluded
3. No history of orthodontic treatment
4. no history of systemic disease, craniofacial deformities or syndrome.

NAME : _____

AGE : _____

SEX : _____

CITY : _____

MOLAR RELATION

CLASS I ☐ → DIVISION → 1 ☐
→ 2 ☐
CLASS II ☐ → SUBDIVISION → R ☐
→ L ☐
CLASS III ☐ → SUBDIVISION → R ☐
→ L ☐

VERTICAL RELATION

→ OPEN BITE ☐
→ DEEP BITE ☐
→ NORMAL ☐

TRANSVERSE RELATION

CROSS BITE OR NORMAL ☐ → ANTERIOR ☐ → UNILATERAL ☐ → R ☐
→ POSTERIOR ☐ → BILATERAL ☐ → L ☐
SCISSOR BITE → PRESENT ☐ → UNILATERAL ☐ → R ☐
→ ABSENT ☐ → BILATERAL ☐ → L ☐

SPACING

→ PRESENT ☐ → UPPER ☐
→ ABSENT ☐ → LOWER ☐

CROWDING

→ PRESENT ☐ → UPPER ☐
→ ABSENT ☐ → LOWER ☐

- **Angle's Class I relation:** Mesiobuccal cusp of the maxillary first permanent molar articulates in the mesiobuccal groove of the mandibular first permanent molar.
- **Angle's Class II relation:** The mesiobuccal cusp of maxillary first permanent molar articulates mesial to mesiobuccal groove of mandibular first molars.
Angle's Class II Division 1: A class II relation in which maxillary incisors are inclined labially, and increased overjet is present.
Angle's Class II Division 2: A class II relation in which maxillary central incisors are inclined lingually, and maxillary lateral incisors have tipped labially and mesially, covering the distal of central incisors. The overjet is reduced, and there is deep bite of partial / complete / traumatic / more than 100% nature.
- **Angle's Class III relation:** The mesiobuccal cusp of maxillary first permanent molar occludes distal to mesiobuccal groove of mandibular first molars.

However, subdivisions of Angle's class II & III were not considered during this study.

- **Overjet** was defined as the horizontal distance between the incisal edge of the most prominent maxillary central incisors to the labial surface of corresponding mandibular central incisors. It was measured with a graduated scale and evaluated to the nearest 0.5mm. An overjet greater than 3 mm was considered to be increased.

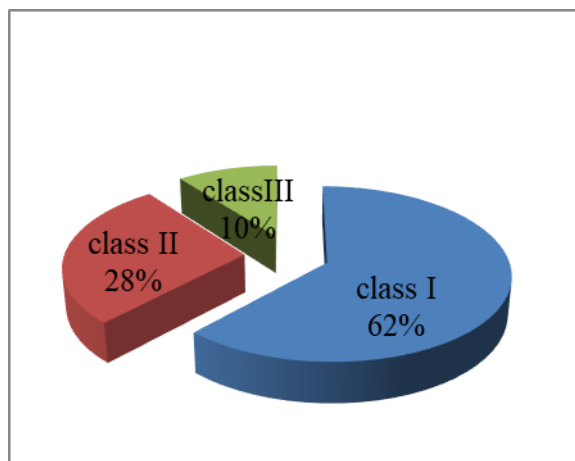
- **Overbite** is the vertical relationship of the upper and lower incisors. It was recorded as increased when the maxillary central incisors covered the mandibular central incisors by more than 3 mm.

- **Anterior open bite** was recorded when incisal edges of the maxillary incisors did not overlap the incisal edges of the mandibular incisors.

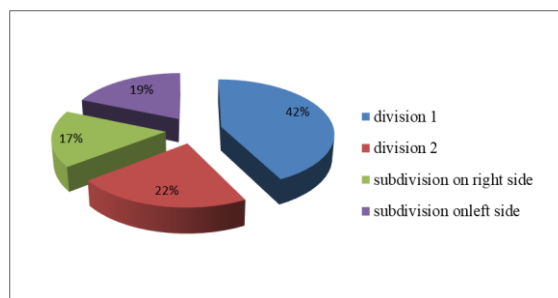
- **Crowding** was defined as overlapping of erupted teeth due to insufficient space or lack of space for teeth to erupt in the dental arch.

- **Spacing** was recorded to be present when there was no approximal contact between 2 teeth in a dental arch. However, no quantitative or qualitative measurement for crowding & spacing was done in any arches. It was just recorded as either present or absent in either of the dental arch. No segregation was done for upper or lower arch.

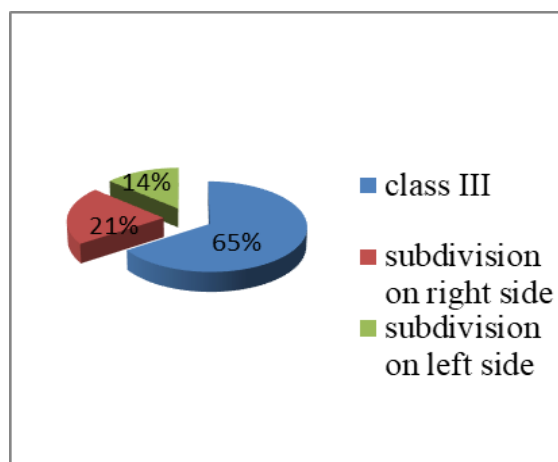
RESULTS



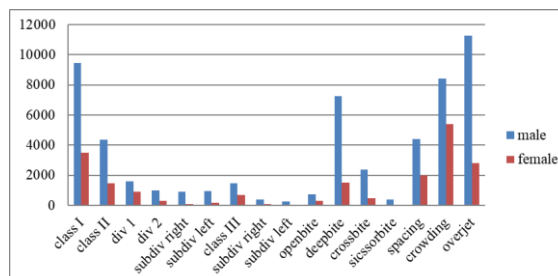
Graph 1: Prevalence of malocclusion in Gujarat.



Graph 2: Angles's Class II malocclusion



Graph3: Angle's Class III Malocclusion



Graph 4: Comparison between male and female group.

Table 1: prevalence of malocclusion in gujarat

Class I	Class II	Class III
12947	5792	2173
61.91%	27.69%	10.39%

Table 2: Vertical relation

vertical relation	
openbite	deep bite
998	8739
transverse relation	

Crossbite			3756		
anterio r	posterio r	bilatera l	unilatera l	right	left
2369	1387	469	918	349	56 9
Sicssorbite			426		
	426	85	341	205	13 6

Table 3: Other parameters

other parameters			
spacing		upper	lower
	6349	3865	2463
crowding		upper	lower
	13792	10986	13768
increased overjet		14078	

DISSCUSION

Malocclusion is 'any deviation from normal occlusion of teeth. The teeth are in abnormal position in relationship to the basal bone of the alveolar process, to the adjacent teeth and/or to the opposing teeth. According to Angle's occlusion is the normal relation of the occlusal inclined planes of the teeth when the jaws are closed". Orthodontic anomalies have been associated with psychosocial distress, poor periodontal condition and impaired masticatory function and so should be regarded as health problem. Malocclusion is not just an invariable disease state, but a continuous spectrum of occlusal variation, occurring as a myriad of combinations of permutations of a number of heterogeneous traits or symptoms each with its own wide range of severity and implications in creating a particular manifestation of occlusion.

In the present study Class I 12947 samples (61.91%). Class II 5792 samples (27.69%). Class III 2173 samples (10.39%) results were seen. As the study done by Kumar p did not concluded about the types of malocclusion present in the samples also occlusal traits except for caries were not taken in consideration.

Study done by Ajay ie. in Benin City of Nigeria revealed predominance of Class 1 malocclusion among children of the south – southern region of Nigeria. No statistically significant gender difference

was observed for any occlusal traits evaluated in this survey. In our study Class I malocclusion was the highest seen type of malocclusion Class I 320 samples (66.3%) which was higher than the results obtained by Ajay ie. The study done by Prasad AR in Bangalore city showed number of incidence of malocclusion (85.7%) with Class I (51.5%), Class II (4%), Class III (0.9%). Also crowded incisors were prevalently seen throughout the study which was the commonest feature associated with Class I malocclusion. In the study done by Pratiksha Panhalkar Class I 320 samples (66.3%) Class II 158 samples (32.7%). Class III 5 samples (1%) results were seen. Class I malocclusion being the predominant.

Joshi *et al.* studied primary dentition in 100 children aged 3-6yrs from Gujarat and reported that spaced dentition was more common than the closed type. They found out that the amount of spacing was common in males. The study includes various occlusal traits. These include occlusal antero-posterior relationship, Overjet, overbite, open bite, spacing, crowding, and midline diastema, caries in deciduous & permanent teeth and anomalies of missing permanent teeth, impacted / unerupted teeth and malformed teeth. Angle's classification was used as parameter to assess malocclusion. Malocclusion was assessed in buccal, sagittal, Anteroposteior relationship of upper and lower arches. In the study children from age of 10-16 years were taken under consideration. There were 252(52.17%) male students & 231(47.82%) female students. The most commonly occurring malocclusion was class 1 malocclusion.

the prevalence of class I, II and III malocclusion of first molars was 52.0%, 32.6% and 12.3% respectively. The reported prevalence of dental malocclusion in a Colombian study of young patients varied from 39% to 93%. The prevalence of different types of malocclusion may show considerable variability, even in a population of the same origin. The criteria for normality vary from one examiner to another, and this affects the results of different studies. Our data are in agreement with Sari et al., who reported that 61.7% of the patients in Turkey had class I, 28.1% had class II and 10.2% had class III Angle dental malocclusion . Small differences between different sets of results may be

related to sample selection, ethnic origin and sample size. The sample analysed by Sari et al. consisted of patients accepted for treatment, whereas our sample consisted of the total referred population.

Our results are also very similar to those of Jones, who investigated dental malocclusion in 132 Saudi Arabian patients referred for orthodontic treatment and reported that 53.8% had class I, 33.3% class II and 12.9% had class III Angle dental malocclusions. However, these results might not represent the prevalence of malocclusion in the reference population because the sample size was insufficient. Our findings show less agreement with Sayin and Türkkahraman's study, which found that the prevalence of class I, II and III Angle dental malocclusions in a Turkish population referred for orthodontic treatment was 64%, 24% and 12% respectively. Although their reported frequency of class I and II malocclusions was different from our results, the frequency of class I and class III malocclusion were quite similar.

Ucuncu and Ertugay found that 83.2% of the Turkish patients referred for treatment, but only 38.3% of the school-aged population, had a great need for orthodontic treatment. In another study Danaei et al. found that in 7-9-year-old children in Shiraz, the prevalence of class I, II and III malocclusion was 47.4%, 14.7% and 2.1% respectively.

These studies showed a higher prevalence of malocclusion than in Indian population when compared with studies done during the same period in India by Shourie KL, Miglani, Tiwari A and others who observed 19.6-37.52% as the prevalence in Punjabi subjects. The prevalence of malocclusion in India has been observed to be ranging from 20% to 43%. Class I malocclusion ranges from 66.7% in the desert state of Rajasthan (North India) to 49.2% in Bangalore (south India) 34 to 91.6% in 5-9 year age group and 27.7% in 10-13 years age group in New Delhi (Central India). These results shows lesser prevalence of Class I malocclusion as compared 62.9% in Latino Adolescents as was observed by Silva RG et al. and 80.7% in Benin City, Nigeria as observed by Emmanuel OA in his study sample.

The prevalence of Class II malocclusion in India varies from 1.9% in Rajasthan 6 to 4.6% in

Bangalore 4 to 6% in 5-9 year age group and 14.6% in 10-13 years age group in New Delhi. These results were significantly different from those by Emmanuel OA, who observed 1.1% as the prevalence of Class II in Benin city, Nigeria and Silva RG et al., who observed 21.5% as the prevalence of class II malocclusion in Latino Adolescents.

Similarly, Class III malocclusion ranges from 1.4% in Rajasthan 6 to 0.3% in Bangalore 34 to 3.4% in 10-13 years age group in New Delhi. These findings are different from Caucasians, where it ranges from 0.8 to 4.0% and Chinese population where it is very high as compared to Indian population (12-13%).

CONCLUSION

The conclusions which can be drawn from this study is as follows:

- Class I malocclusion had the highest prevalence (61.91%) followed by class II division 1, class II division 2 and class III malocclusion being the least prevalent.

Among class I malocclusion characteristics, Angle's class I was the most common malocclusion which Efforts should be made on a larger scale to obtain a base line data based upon which various public health strategies could be formulated.

A risk-benefit analysis should be done and treatment should be instituted only when the perceived benefits in commencing treatment at that time outweigh the potential risks. A significant problem in epidemiological studies is the lack of uniformity in the measurement criteria between various studies since there is no universally accepted index for measuring malocclusion and most of them show significant intra and inter examiner variability. Further research would therefore be needed to develop better indices or to improve the available indices so that they can be universally standardized and epidemiologically accepted. Prevention of occurrence of dental caries by various preventive programmes and an early treatment of caries still remain one of the best means of reducing the occurrence of malocclusion traits, especially crowding. A systematic and well-organized dental health care program in a community requires some basic information, such

as epidemiological studies on the prevalence of orthodontic parameters. In developed countries with a well-developed orthodontic care system, such information is readily available. But in developing countries like India, this information is usually lacking.

Epidemiological evaluations of dental diseases, such as malocclusion, are a prerequisite for systematic planning of preventive and therapeutic measures for confronting such problems and for assessing the current traits regarding orthodontic treatment in a particular population. The study was directed toward the achievement of these goals.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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