Research Article

Pattern of Malocclusion and Treatment need in Orthodontic Patients in Rural Population: An Institution Based Study

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ABSTRACT

Objective: The aim of the study was to assess the prevalence and pattern of malocclusion among patients who visited Department of Orthodontics of Rajasthan Dental College and Hospital, Jaipur (Rajasthan) through a awareness program, being conducted at Bagru as a baseline data for proper treatment planning, teaching, and further research.

Materials & Method: This study was conducted on 125 patients who attended the Orthodontic Department from November 2011 to November 2012. Information regarding age, sex, type of malocclusion, dentofacial patterns and dentofacial characteristics was obtained from patient records. Orthodontic treatment need was assessed using DHC component of IOTN.

Results: The results of the study showed that the patients age ranged from 9 to 32 years. There were 63(50.4%) males and 62(49.6%) females. Chief complaints of majority of patients were 'forwardly placed upper teeth' and 'irregularly placed teeth'. The commonest type of malocclusion was Angle's class II which was seen in 77 (61.6%) of patients. There was an increased overjet in 70.4% of subjects. Assessment of need for orthodontic treatment using the DHC component of IOTN showed that 46 (36.8%) were in great need of orthodontic treatment and 36(28.8%) had definite need of treatment.

Conclusion: The results give a detailed pattern of malocclusion in orthodontic patients of rural area and may provide a baseline data for research and planning orthodontic services.

Keywords: Malocclusion, Prevalence, IOTN.

INTRODUCTION:

A systematic and well-organized dental care program for any target population in a community requires some basic information, such as prevalence of the condition. In the more developed parts of the world, where the speciality of Orthodontics has been established, adequate basic information is available. In developing nations, such information can be lacking. Therefore, rational planning of orthodontic measures is essential in assessing the resources required for such a service. This stresses the importance of studies in order to obtain knowledge about the prevalence of different types of malocclusion and need for orthodontic treatment in rural population.

The prevalence of malocclusion varies from country to country and between different age and sex groups; its prevalence in India is 20-43% for many years. Studies have been conducted to determine the prevalence of malocclusion in different populations. Instead differentiating normal and abnormal in a population, determining frequencies of different types of malocclusions in a referred population may give valuable information. There have been several studies investigating the prevalence of various dentofacial characteristics in

different population but only few have been conducted on orthodontic population.[8,11,15,16]

The aim of the study was to provide quantitative information regarding the pattern of dentofacial characteristics in orthodontic patients and to find the frequencies of Angle's classes and other dentofacial characteristics in rural area.

MATERIALS AND METHOD

An awareness program was conducted in the rural area of Jaipur, near our college at Bagru. This study was done on orthodontic patients who visited Department of Orthodontics of Rajasthan Dental College & Hospital through this awareness program from November 2011 to November 2012.

Pretreatment Orthodontic records of 125 patients were obtained and used for this study. Data collection was based on written case history, clinical examination, study casts, lateral cephalogram and OPG. A qualitative analysis with Angle's classification was used to describe the anteroposterior relationship of maxillary and mandibular first molars.[1,5] Incisor classification was described based on British Standard classification of incisor relationship.

The following dentofacial characteristics were recorded using initial records:

1. Angle's malocclusion
2. Arch length discrepancy
3. Chief complaint
4. Facial type
5. Facial profile
6. Overjet
7. Overbite
8. Cephalometric skeletal analysis

Orthodontic treatment need was assessed by using dental health component (DHC) of index of orthodontic treatment need (IOTN). The DHC was developed to reduce the subjectivity in measurement by using well-defined cut-off points. Malocclusions were divided into five different groups ranging from very great need (Grade V) to no treatment need (Grade I).[6,7] Descriptive statistics were calculated to find the means and standard deviations. Data collected were pooled to determine frequencies and cross tabulations of dentofacial characteristics with Angle's classes.

RESULTS

Age and Gender

Out of 125 patients, 63 (50.4%) were males. Ages of patients ranged from 9 to 32 years with mean age of 17.5 years as shown in Figure 1.

Chief Complaint

In majority of patients chief complaints were 'forwardly placed upper teeth' (51.2%) and 'irregularly placed teeth' (43.2%) as shown in Figure 2.

Malocclusion types:

Class II malocclusion was found in 77 patients which represented 61.6% of the sample. Frequency of class I & III were 35.2% and 3.2% respectively. Incisors type class II div 1 (40.8%) was the most common feature of the samples. The distribution of malocclusion according to Angle's and Incisor classification is presented in Table 1 and Table 2.

DENTOFACIAL PATTERNS

Most patients had mesiofacial (64.8%) facial type with convex profile (76%) and posterior divergence (55.2%) as shown in Table 3.

DENTOFACIAL CHARACTERISTICS

There was increased overjet and overbite in 70.4% and 68.8% of the subjects respectively. Maxillary crowding was present in 60.8% of the sample and mandibular crowding was present in 71.2% of sample. (Table 4)

ORTHODONTIC TREATMENT NEED

Out of 125 patients 46 (36.8%) patients were found to be in great need of treatment i.e. Grade V, 36 (28.8%) patients required definite treatment i.e. Grade IV, 33(26.4%) with moderate need i.e. Grade III and 10 (8%) with mild need i.e. Grade II (Table 5).

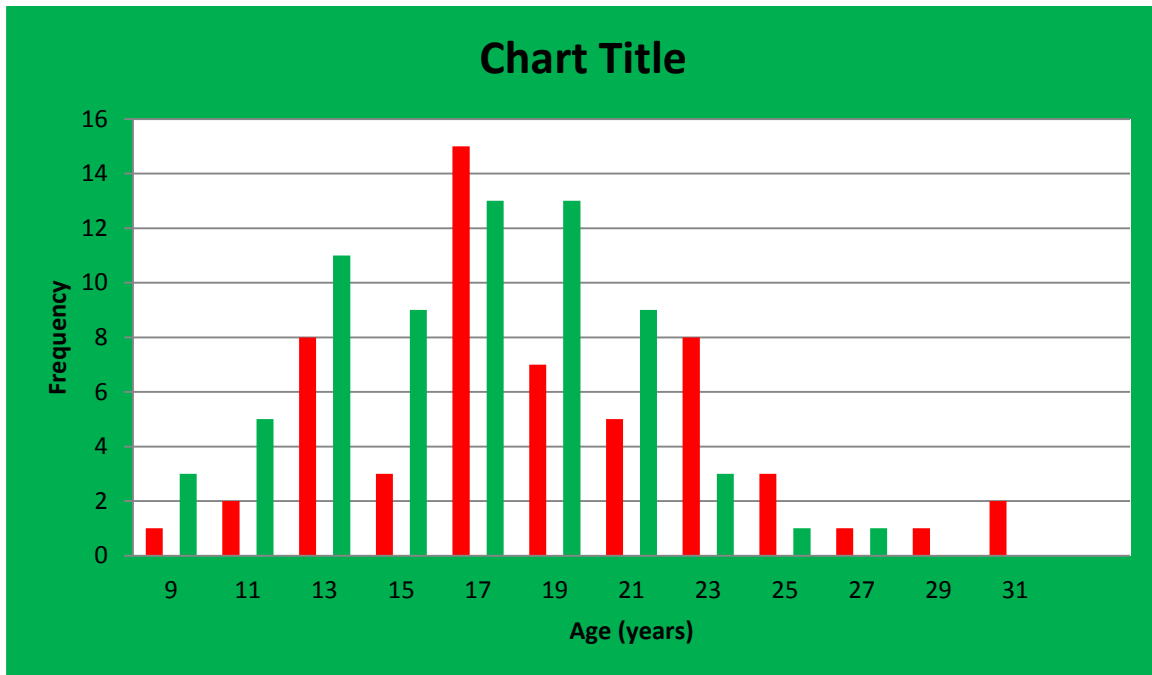**Figure 1:** Chronological age range of the sample showing its frequency distribution

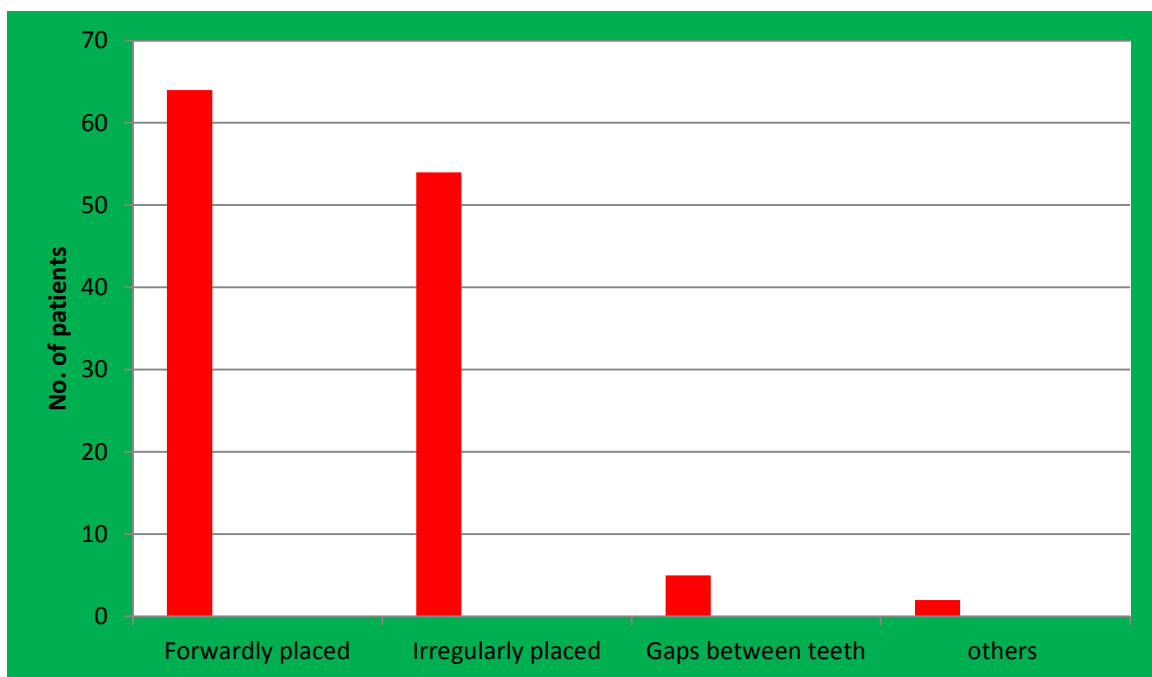**Figure 2:** Chief complaint of the patients

Table 1: Distribution of sample by Angle's and Incisor classification

Angle's classification	Number = 125 (%)	Incisor classification	Number = 125 (%)
Class I	44 (35.2%)	Class I	45 (36%)
Class II	77 (61.6%)	Class II div 1	51 (40.8%)
		Class II div 2	22 (17.6%)
Class III	04 (3.2%)	Class III	07 (5.6%)

Table 2: Cross tabulation of Angle's and skeletal classes

Skeletal classes	Angle's Classes			Total number = 125 (%)
	Class I	Class II	Class III	
Skeletal class I	28	14	00	44 (35.2%)
Skeletal class II	11	63	00	77 (61.6%)
Skeletal class III	05	00	04	09 (7.2%)

Table 3: Cross tabulation of dentofacial patterns with Angle's classes

Dentofacial characteristic		class I 44(35.2) Number (%)	class II 77(61.6) Number (%)	class III 04(3.2) Number (%)	Total Number=125 (%)
Facial type	Leptofacial	9 (20.4)	24(31.1)	01(25)	34(27.2)
	Mesofacial	32(72.7)	45(58.4)	03(75)	80(64)
	Brachyfacial	03(6.8)	08(10.3)	00	11(8.8)
Facial Profile	Orthognathic	14(31.8)	10(12.9)	01(25)	25(20)
	Retrognathic	28(63.6)	67(87)	00	95(76)
	Prognathic	02(4.5)	00	03(75)	05(4)
Divergence	Straight	26(59)	24(31.1)	01(25)	51(40.8)
	Posterior	15(34)	53(68.8)	00	68(54.4)
	Anterior	03(6.8)	00	03(75)	06(4.8)

Table 4: Cross tabulation of dentofacial characteristics with Angle's classes

Dentofacial characteristic		class I	class II	class III	Total
Crowding (mm)					
0-1 Normal	Maxilla	16(36.3)	32(41.5)	01(25)	49(39.2)
	Mandible	14(31.8)	20(25.9)	02(50)	36(28.8)
2-3 Mild	Maxilla	14(31.8)	15(19.4)	02(50)	31(24.8)
	Mandible	13(29.5)	21(27.2)	01(25)	35(28)
4-6 Moderate	Maxilla	07(15.9)	20(25.9)	01(25)	28(22.4)
	Mandible	09(20.4)	25(32.4)	01(25)	35(28)
>7 severe	Maxilla	07(15.9)	10(12.9)	00	17(13.6)
	Mandible	08(18.1)	11(14.2)	00	19(15.2)
Spacing (mm)					
0-1 Normal	Maxilla	27(61.3)	39(50.6)	02(50)	68(54.4)
	Mandible	34(77.2)	57(74)	01(25)	92(73.6)
2-3 Mild	Maxilla	06(13.6)	20(25.9)	01(25)	27(21.6)
	Mandible	07(15.9)	10(12.9)	02(50)	19(15.2)
4-6 Moderate	Maxilla	05(11.3)	12(15.5)	01(25)	18(14.4)
	Mandible	01(2.2)	08(10.3)	01(25)	10(8)
>7 severe	Maxilla	06(13.6)	06(7.7)	00	12(9.6)
	Mandible	02(4.5)	02(2.5)	00	04(3.2)
Overjet(mm)					
1-2 Normal		14(31.8)	16(20.7)	00	30(24)
3-4 Mild		15(34)	11(14.2)	00	26(20.8)
5-6 Moderate		07(15.9)	14(18.1)	00	21(16.8)
>7 severe		05(11.3)	36(46.7)	00	41(32.8)
Reverse		03(6.8)	00	04(100)	07(5.6)
Overbite(mm)					
0-2 Normal		20(45.4)	10(12.9)	01(25)	31(24.8)
3-4 Moderate		16(36.3)	40(51.9)	00	56(44.8)
5-7 Severe		03(6.8)	27(35)	00	30(24)
Reverse		02(4.5)	00	00	02(1.6)

Openbite	03(6.8)	00	03(75)	06(4.8)

Table 5: Treatment need according to IOTN

Gender	Grade I	Grade II	Grade III	Grade IV	Grade V
Male	00	00	20	15	28
Female	00	10	13	21	18
Total	00	10(8%)	33(26.4%)	36(28.8%)	46(36.8%)

DISCUSSION

According to result, the mean age of the patients was 17.5years. The number of female patients (49.6%) is less than male patients (50.4%). This is an interesting and contradicting finding with the findings of other similar studies. Other studies showed that the concern of orthodontic treatment need of females are high in our society[9], but it is not true for rural population as in rural area there is low literacy rate and low female child ratio.

Majority of patients had the chief complaint of 'forwardly placed upper teeth' and irregularly placed teeth' this is in accordance with the results obtained with other similar studies.

Angle's class II (61.6%) and incisor class II div1 (40.8%) was the most frequent pattern of malocclusion found in the sample, while class I malocclusion was 35.2% and class III (3.2%).

Skeletal class II (59.2%) was the most frequent pattern of malocclusion. Similarly, Lalita Nanjannawar et al[16] and Ijaz A[10] reported Angle's class II div 1 and skeletal class III as the most common pattern of malocclusion.

This study showed that most patients had mesiofacial (64%) facial type, retrognathic facial profile (76%) and posterior divergence (54.4%). Lalita Nanjannawar et al[16] reported orthognathic profile as most common profile. Siriwat et al[3] while correlating malocclusion and facial morphology concluded that hyper divergent pattern is dominant in class II and III malocclusion.

Jones[4] investigated malocclusion and facial types in 132 Saudi Arabian patients referred for orthodontic treatment and reported that 53.8% had class I, 28.8% had class II div 1, 4.5% had class II div 2 and 2.9% had class III malocclusion. Yang evaluated 3305 patients and reported that percentages of class I, class II div1, class II div2, class III were 35.9, 13.4, 1.5 & 49.1% respectively.

The result of this study showed an increased overjet (70.4%) and overbite (68.8%) as major occlusal findings, with an increased frequency and severity in class II patients. This trend in overjet and overbite values is in agreement with the earlier surveys of orthodontic populations.[4]

Results showed maxillary crowding 60.8%, mandibular crowding 71.2%, and maxillary spacing 45.6% while Ali borzabadi[13] found severe crowding in 16.7% maxilla and 10.8% in mandible. Sayin and Turkkahraman[12] found moderate maxillary crowding and mild mandibular crowding to be the most common finding in all types of malocclusion.

Out of 125 patients, 46 (36.8%) patients were found to be in great need of treatment, 36 (28.8%) patients required definite treatment, 26.4% has moderate need of orthodontic treatment.[14] This study has incorporated a number of variables while evaluating pattern of malocclusion characteristics. Difference between this study and other studies would be expected because of differences in ethnic and racial variations. These results cannot be representative of the whole of the Indian rural population and thus expected to vary in degree of prevalence of dentofacial characteristics.

CONCLUSION

This is an institution-based study. The frequency of class I, II and III malocclusion was found to be 35.2%, 61.6% and 3.2% respectively. Chief complaints of majority of patients were forwardly placed upper teeth and irregularly placed teeth. The numbers of female patient are less when compared to male patients. Among the entire dentoalveolar characteristics studied increased overjet was found to be the most common feature. According to DHC component of IOTN 46 (36.8%) patients were in great need of orthodontic treatment.

CLINICAL SIGNIFICANCE

Clinical significance of this study is to identify occlusal problems, their incidence and the need for treatment in rural population. This type of study helps us to determine the appropriate treatment plan and manpower needed in orthodontics. These results may provide a baseline data for planning orthodontic services in rural areas, but still there is a strong need of analyzing the prevalence of malocclusion in rural Indian population.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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