Original Research Article

Prevalence of malocclusion among 14-17 years old adolescent population in Karaikal District

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Abstract

Introduction: Aesthetic appearance including dental appearance plays a vital role in a person's personality especially among Adolescents. Malocclusion is a Handicapping dentofacial anomaly, which can be prevented in the earlier stage.

Aim and objectives: To find out the prevalence of Malocclusion and association between gender and malocclusion among 14- 17 years old adolescents in Karaikal population.

Materials and methods: 425 participants between the age group of 14-17 years were examined for malocclusion over a period of 15 months and classified according to Angle's classification.

Results: Prevalence of Malocclusion in this study was 32% (136). Around 20.2% had Class I, 9.7% had class II and 2.1% had class III malocclusion. No association was found between gender and malocclusion.

Conclusion: In this study, class I malocclusion is more prevalent. Dental public health services should be trained to diagnose malocclusion at primary health care level to treat malocclusion in the earlier stage.

Key words

Malocclusion, Handicapping Dentofacial Anomaly, Periodontal disease.

Introduction

Nowadays, acceptable aesthetic appearance including dental appearance plays a vital role in the society. An increasing concern for dental appearance is seen more among the adolescent population. Adolescence is defined as those aged between 10 and 19 and this is the period when physical, psychological and social maturing from childhood to adulthood occurs [1]. World Health Organization says that oral diseases with public health importance should be under periodic surveillance for sufficient planning and treatment and they also included malocclusion in Handicapping Dentofacial Anomaly. Malocclusion features the third position among the oral pathologies, next to dental caries and periodontal diseases [2, 3]. Malocclusion is defined as malrelationship of the dental arches or irregularities of the teeth [4]. Even though, there are various methods to classify malocclusion, Angle's classification is widely used because of its simplicity. This study was undertaken to know the prevalence of malocclusion in the adolescent population, in order to correct the deformity in the earlier stage.

Materials and methods

This cross-sectional study was conducted among the adolescents in Karaikal district over a period of 15 months from August 2016 to October 2017. The prevalence of malocclusion in India varies from 19% to 90% [5], so assuming the prevalence to be 50% and absolute precision of 5%, the sample was calculated as 384. After adding the attrition of 10%, the sample was 422. The study protocol was submitted to Institutional ethical committee and clearance was obtained. Children who are between the age group of 14 to 17 years with all permanent teeth attending the dental OPD at Vinayaga Missions' Medical College and Hospital were included in the study. Children with previous Orthodontic treatment were excluded. Informed consent was obtained from the parent of the participants. Initially,

demographic details of the participants were obtained and then, they are examined by a single investigator (qualified Orthodontist). All the participants were examined under adequate light using plane mouth mirror by making them seated in the dental chair and they are classified into normal occlusive, class I, II and III malocclusion according to Angle's Classification.

Class I Malocclusion: When the jaw is at rest and the teeth approximated in centric occlusion, mesiobuccal cusp of the maxillary first molar occluding in the buccal groove of the mandibular first permanent molar and the mesiolingual cusp of the maxillary first permanent molar occludes with the occlusal fossa of the mandibular first permanent molar.

Class II Malocclusion: Mandibular dental arch and body should be in distal relation to the maxillary arch.
Class II- Division 1: Along with class II malocclusion molar relation, the maxillary incisor teeth should be in labioversion.
Class II- Division 2: Along with class II malocclusion molar relation, the maxillary incisors should be in near normal anteroposteriorly or slightly in linguoversion whereas the maxillary lateral incisors are tipped labially and/or mesially.

Class III Malocclusion: The mandibular dental arch and body should be in mesial relationship to the maxillary arch with the mesiobuccal cusp of the maxillary first molar occluding in the interdental space between the distal aspect of the distal cusps of the mandibular first molar and the mesial aspect of the mesial cusps of the mandibular second molar [6].

Statistical analysis
Data were entered into Microsoft Excel and analyzed using SPSS Software version 21. Normal descriptive statistics was done for the

classification of malocclusion and Chi-square test was applied to check the association between gender and malocclusion.

Results

Totally, 425 participants were examined during the study period. Among them, 227 participants were male and 198 were females. In this study, the prevalence of malocclusion was found to be 32% among the adolescents between the age group of 14-17 years. Around 35.7% males and 27.8% females had malocclusion. This difference was not statistically significant and there is no association between the gender and prevalence of malocclusion (**Table - 1**).

Among 136 (32%) participants with malocclusion, class I malocclusion was seen in 20.2%, class II division 1 in 8.2% and class II division 2 in 1.4% participants. Class III malocclusion was seen only in 9 (2.1%) participants. **Table - 2** shows the distribution of different classes of malocclusion among the gender.

Table - 1: Association between Gender and Malocclusion.

Variables	Malocclusion		Total
	Present	**Absent**	
Male	81(35.7%)	146(64.3%)	227
Female	55(27.8%)	143(72.2%)	198
Total	136(32%)	289(68%)	425

Chi-square value = 3.037 and p- value = **0.08** (> 0.05—not significant).

Table - 2: Distribution of Different Classes of Malocclusion among the Gender.

Classes of malocclusion	Gender		Total
	Male	**Female**	
Class I	51(63%)	35(63.6%)	86(63.2%)
Class II Div 1	19(23.5%)	16(29.1%)	35(25.7%)
Class II Div 2	3(3.7%)	3(5.5%)	6(4.4%)
Class III	8(9.8%)	1(1.8%)	9(6.6%)
Total	81(100%)	55(100%)	136(100%)

Discussion

This cross-sectional study was conducted to find the prevalence of malocclusion among the adolescent population. Even though adolescence is a period which starts at the age of 10, the eruption of permanent teeth completes only at the age of 13. This is the reason for selection of age group between 14-17 years in this study as Angle's classification is based on a first permanent molar. Early diagnosis of malocclusion among younger population plays an important role in treating their facial deformity and improving their confidence in the society. Though there are many causes for malocclusion like hereditary, abnormal pressure habits (e.g. Thumb sucking, lip or nail-biting, etc.) and anomalies of the tooth itself, most of them can be prevented by early prevention and by proper orthodontic treatment [6]. In this study, the prevalence of overall malocclusion was found to be 32 %. A study done in Rajasthan shows 43% [7], but a study done in Nepal among adolescent population shows a higher level of 85.58% malocclusion and 14.42% of normal occlusion [8]. Comparatively, our study showed lower prevalence (32%) of malocclusion in the adolescent population. Class I malocclusion was seen in 20.2% in the present study, Proffit, et al. in the United States also reported similar prevalence [9], but Pratap Singh, et al. reported 48.5% in this study [8]. A study done in Tumkur population shows 10% of class II malocclusion [10] and study done in Delhi show only 6% [6].

Our study also shows a similar prevalence of 9.7% class II malocclusion. Class III malocclusion was seen in only 2.1% and the study was done in rural Haryana shows the much lower prevalence of 0.6% [6]. In our study, no association was found between the gender and the prevalence of malocclusion and it is supported by Sridharan, et al. [10]. The differences in the prevalence among different population could be due to ethnicity and different sample size. Participants with severe malocclusion in this study were counseled for orthodontic treatment.

Conclusion

Angle's class I malocclusion is more prevalent in this adolescent population. As malocclusion is a deformity which can be prevented in the earlier stage, public dental health services should concentrate more on this condition. Primary health care providers should be trained to diagnose the severe form of malocclusion with available minimum facilities and refer them to the orthodontic professionals for further evaluation.

References

1. Park K. Social Welfare Programmes. In Park's Text Book of Preventive and Social Medicine.23rd edition. Jabalpur: Banarsidas Bhanot; 2015, p. 593.
2. Brito D. I., Dias P. F., Gleiser R. Prevalence of malocclusion in children aged 9 to 12 years old in the city of Nova friburgo, Rio de Janeiro State, Brazil. Revista Dental Press de Ortodontia e Ortopedia Facial., 2009; 14(6): 118–124.
3. Hassan R, Rahimah AK. Occlusion, malocclusion, and method of measurements: an overview. Arch Orofacial Sciences, 2007; 2: 3–9.
4. Mtaya M, Brudvik P, Astrom AN. Prevalence of malocclusion and its relationship with socio-demographic factors, dental caries, and oral hygiene in 12 to 14-year-old Tanzanian school children. Eur J Orthod., 2009; 31: 467–476.
5. Sidhu SS. Incidence of varieties of malocclusion. J Ind Orthod Soc., 1968; 1: 17–20.
6. Marya CM. Epidemiology and Etiology of Malocclusion. In A Textbook of Public Health Dentistry. 1st Ed. New Delhi: Jaypee Publishers, 2011; p. 144-155.
7. Arora G, Bhateja S. Prevalence of dental caries, periodontitis, and oral hygiene status among 12-year-old schoolchildren having normal occlusion and malocclusion in Mathura city: A comparative epidemiological study. Indian J Dent Res., 2015; 26: 48-52.
8. Varun P, Amita S. Epidemiology of Malocclusion and Assessment of Orthodontic Treatment Need for Nepalese Children. Int Sch Res Notices, 2014; 2014: 768357.
9. Proffit W. R., Fields H. W. Jr., Moray L. J. Prevalence of malocclusion and orthodontic treatment need in the United States: estimates from the NHANES III survey. The International Journal of Adult Orthodontics and Orthognathic Surgery, 1998; 13(2): 97–106.
10. Sridharan K, et al. Prevalence of Class II Malocclusion in Tumkur Population. Journal of Dental Sciences and Research, 2011; 2(2): 1-5.