

PREVALENCE AND ASSOCIATED FACTORS FOR CROWDING IN PATIENTS WITH CLASS III MALOCCLUSION VISITING A PRIVATE DENTAL COLLEGE IN CHENNAI

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ABSTRACT

Numerous studies in the past have been conducted to determine the prevalence of malocclusion in different populations. These show extreme variations and it is only right to determine the prevalence in a referred population. Class III malocclusion even though it is the least common, treatment planning and treatment is quite difficult, thus characteristics of class III malocclusion need to be studied in detail. The aim of the study is to evaluate the prevalence of crowding among patients with class III malocclusion visiting Saveetha dental college and hospitals. A retrospective study was done using case sheets of patients visiting the university hospital from June 2019- February 2020. About 100 case sheets of patients visiting the department of orthodontics containing information on malocclusion type and crowding was retrieved and analysed using SPSS 20.0. The study included 100 patients out of which 74% were males and 26% were females. Crowding was observed in 51% of the patients with class III malocclusion. Out of which 62.75% of the patients were reported to have minimal crowding, 31.37% had moderate crowding and 5.88% had severe crowding of the mandibular incisors. There was no statistically significant association between age, gender, and severity of crowding as determined by Pearson's chi-square tests. Within the limits of the study, it can be concluded that mild mandibular crowding was the most common finding in class III malocclusion patients.

Keywords: Class III malocclusion; Crowding; Malocclusion; Mild; Severity

1. Introduction

Edward Hartley angle in 1899 coined the term malocclusion referring to the teeth that were twisted or unevenly arranged^{1,2}. Malocclusion is a variation from ideal occlusion that may be considered aesthetically displeasing but it is neither normal nor unhealthy³⁻⁵. A malocclusion is not an acute condition which requires urgent relief; instead, it is a variation from normal, which may or may not predispose to a disease or impairment^{6,7}. It is important to understand that presence of malocclusion and need for treatment is not the same⁸⁻¹⁰. The assessment of orthodontic treatment need and complexity is necessary for the planning of orthodontic services in any given population, as well as training programmes for specialists^{11,12}. Need for treatment must be evaluated based on aesthetics, dental health and functional elements of the patients¹³.

For many years, studies have been conducted to determine the prevalence of malocclusion in different population.¹⁴⁻¹⁷ Comparing the results of these studies is almost impossible because they will have huge variation among them, even studies conducted in the population of same origin will have innumerable variations among each other. Thus, instead of trying to generalise a finding it is better to determine frequencies of different types of malocclusion in a referred population as this will give results which will actually provide some useful information.

The demand for orthodontic treatment is increasing in most countries^{18,19}. The primary reason for this could be the direct effect of malocclusion on the quality of life and patient's psychological well being.^{6,20} Therefore it is important to do a rational planning of orthodontic measures in assessing the resources required for such a service.²¹⁻²⁴ This implies the importance of studies in order to obtain knowledge about the prevalence of different types of malocclusion and need for orthodontic treatment.²⁵

It is very difficult to diagnose and treat class III malocclusion²⁶. Management of Class III malocclusion is one of the most challenging treatments in orthodontics. This type of malocclusion involves a number of cranial base and maxillary and mandibular skeletal and dental compensation components.²⁶ Thus it becomes imperative to understand the clinical features and characteristics of class III malocclusion as the information on growth¹⁸ in different types of malocclusions and dentoskeletal discrepancies is vital to plan appropriate orthodontic treatment, anticipate growth trends in patients and refer to adequate control data when evaluating treatment outcomes. This study was conducted as a first step in understanding features of class III among the south indian population. The aim of the study is to evaluate the prevalence of crowding among patients with class III malocclusion visiting Saveetha dental college and hospitals.

2. Materials and methods

A retrospective observational study was conducted from the data collected from June 2019- Feb 2020 on patients who were referred to the orthodontic department of Saveetha dental college and Hospitals. A total of 100 true skeletal class III patients were recruited for the study based on a non-probability sampling method. All the pretreatment data was collected from recorded case sheets. All males and female patients who met the following criteria were included in the study:

1. Age :12-40 yrs (true skeletal class III)
2. Permanent dentition with no retained deciduous teeth
3. No missing teeth
4. No history of extraction
5. No history of orthodontic treatment
6. Any patients with congenitally missing teeth or congenital malformations were excluded

Initially, the subjects were categorised based on whether they had crowding or not. The data collected was subjected to photographic cross verification. Then, the subjects who had crowding were categorised into groups by severity of crowding (mild, moderate, severe) and data analysed. Descriptive statistics were done and a chi-square test was used to find the relationship of severity of crowding with age and gender. A p value of less than 0.05 is considered to be statistically significant. Data tabulation and analysis was processed using a statistical program for social sciences (SPSS) version 20.0 software.

3. Results and Discussion

I : Age and gender

Out of the 100 patients, 74% were males and 26% were females. Ages of the patients ranged from 12-40 yrs with the mean age of 23 years \pm 6.7 years. 28% of the participants were adolescents (12-18 years) and 72% of the participants were adults (19-40 yrs).

II : Crowding

Crowding was observed in 51% of the patients with class III malocclusion as shown in figure 1.

III : Severity of crowding

Out of the 51 patients who had crowding, 62.75% of the patients were reported to have minimal crowding ,31.37% had moderate crowding and 5.88% had severe crowding of the mandibular anteriors as shown in figure 2.

IV : Association between age, gender and severity of crowding

The results of our study reveals that, among adolescents 76.4% had minimal crowding, 23.6% had severe crowding. Among adults, about 55.8% had minimal crowding, 35.2% had moderate crowding and 9% had severe crowding. Adults had a higher incidence of severe crowding than adolescents as seen in figure 3. However , this was not statistically significant with the p value > 0.05 as determined by Pearson's chi square test.

According to our study, among females, 50% had minimal crowding, 42.8% had moderate crowding , and 7.2% had severe crowding. Among males, 67.5% had minimal crowding, 27.7.% had moderate crowding, 5.5% had severe crowding. Females seemed to have an increased incidence of severe crowding than males as shown in figure 4. However there was no statistically significant (p value>0.05) association found between age, gender and severity of crowding in the chi-square tests performed between these variables.

Although many studies have been published that describe the prevalence and type of malocclusion, it is difficult to compare and contrast these results due to the varying methods,age differences of the study population²⁷⁻²⁹, specific objective like our study was only focussed on prevalence of crowding in class III malocclusion whereas other studies would have looked all types of malocclusion. Thus, the results of the study would also vary from the results of previous studies in various aspects.

In our study, 74% were males and 26% were females, however in the study conducted by Nanjannwar et al²⁵ ,72.8% were female patients thus, showing the need for orthodontic treatment among females. This is contradictory to the results of our study and this may be due to different populations as well as different sampling methods.

The results of our study indicate that mild mandibular crowding is the most common finding among class III malocclusion patients. Khan et al ¹ reported that mild mandibular crowding was most frequently observed in class III malocclusion patients (mild-53.4%, moderate-32.5% and severe-13.9%) which is comparable to the results of our study. Similarly Nanjannwar et al²⁵ reported that mild crowding was the most common among class III malocclusion patients(71%) which is in agreement with the current study. Sayin et al ¹⁴ reported similar results saying mild mandibular crowding was the most common finding and severe mandibular crowding is least frequently observed, both of which are in compliance with the current study.

In our study, there was no significant association between age, gender and severity of crowding. Similarly Gelgor IE et al ³⁰ reported that no gender differences were noted with severity of crowding. However, no studies reported on any relationship between age range and severity of crowding in class III malocclusion to the best of the knowledge of the author of this study.

This study also had a few limitations such as the data was collected from the software, thus was entered by numerous examiners, thus there could have been examiner bias. The study was done with a small sample size with a shorter duration . hence the results could not be generalised for the entire population.

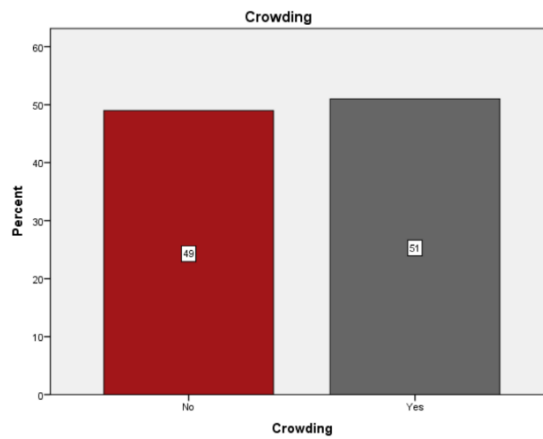


Figure 1: The bar graphs represents the presence and absence of crowding in patients. X axis represents the presence or absence of crowding whereas the Y axis represents the number of participants in each category. Out of the 100 participants 51% had crowding.

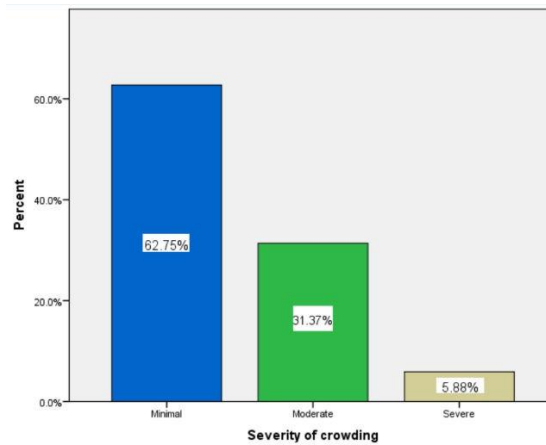


Figure 2: The bar graphs represents the percentage of patients who had various degrees of crowding in mandibular anterior teeth. X axis represents the severity of crowding whereas the Y axis represents the number of participants in each category. Out of the 51 patients who had crowding, 62.75% of the patients were reported to have minimal crowding (blue), 31.37% had moderate crowding (green) and 5.88% had severe crowding (beige) of the mandibular anteriors.

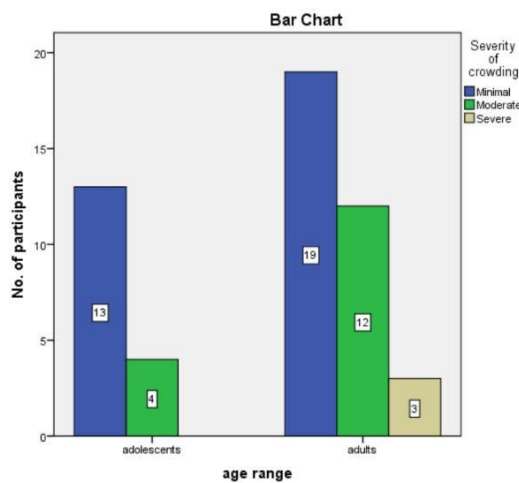


Figure 3 : The bar graph represents the association between different age groups and severity of crowding. X axis represents the different age groups whereas the Y axis represents the number of participants in each category with the blue bars representing minimal crowding, green bars representing moderate crowding and beige bars representing severe crowding. Adults had a higher incidence of severe crowding than

adolescents. There was no statistically significant association between age and severity of crowding as determined by Pearson's chi-square test. (Pearson's chi square value- 2.7; df -2;p value- 0.25 (>0.05))

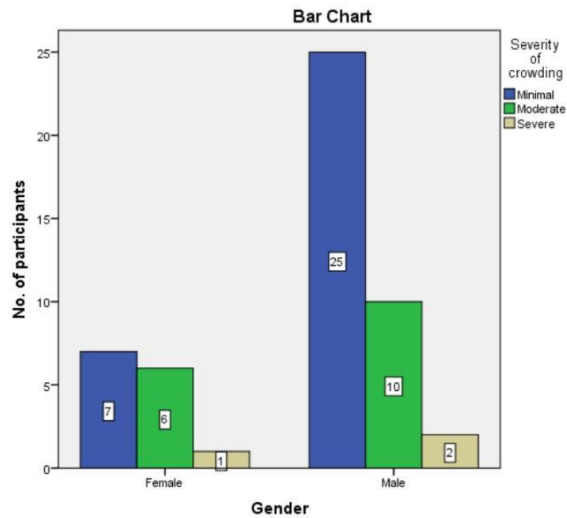


Figure 4 : The bar graph represents the association between different genders and severity of crowding . X axis represents the different genders whereas the Y axis represents the number of participants in each category with the blue bars representing minimal crowding, green bars representing moderate crowding and beige bars representing severe crowding. Males had a higher incidence of severe crowding, however there was no statistically significant association between genders and severity of crowding as determined by Pearson's chi-square test. (Pearson's chi square value- 1.3;df-2; p value -0.50 (>0.05))

4. CONCLUSION

In this institutional study, mild mandibular crowding was the most commonly seen among true skeletal class III malocclusion patients. These results are the first step towards understanding the characteristics of class III among the south indian population, but still there is a strong need for conducting studies on a larger scale with numerous other factors to complete a good epidemiological study.

5. ACKNOWLEDGEMENTS

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6. Conflict of interest

Nil

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