

# PREVALENCE OF CLASS II DENTAL RELATION IN PERMANENT DENTITION - A RETROSPECTIVE STUDY

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## ABSTRACT:

Malocclusion is a common development disorder which can create a negative impact on children and adults. Angle had classified malocclusion into class I, class II, class III based on upper and lower molars. Prevalence of malocclusion varies among different populations based on their ethnicity. This study aims to find out the prevalence of class II dental relation among permanent dentition patients in our population. The study is done among patients who came to the dental college. Patient data is collected from dental case records of patients with permanent dentition. With the collected data, class II malocclusion prevalence among patients were evaluated. Results were analyzed using SPSS statistical software. Out of 37756 patients, 1017 patients (2.69%) had class II malocclusion among permanent dentition. 52.95% were males and 47.05% were females. Prevalence of Class II div I was higher (88%) than class II div 2 (12%). Chi square test done between type of malocclusion and gender was found to be insignificant with P value of 0.564. Within the limitations of the current study, it was found that prevalence of class II malocclusion was less in our population with no significant difference in distribution among males and females.

**Keywords:** Angle Class II, Gender, Permanent dentition, Population, Prevalence study.

## INTRODUCTION:

Malocclusion is a common developmental disorder which can create a negative impact on children and adults such as difficulty in speech, mastication problems, psychological stress, aesthetic concerns etc. (Salzmann, 1965). The prevalence of malocclusion varies among different population based on ethnicity, various races, age, sex and demographic. (Nomura *et al.*, 2009), (Phelan *et al.*, 2004), (Bukhary, 2005).

Angle's classification is one of the oldest yet most commonly used classification of malocclusion in orthodontic practice. (Angle, 1899) Angle classified malocclusion into class I, class II and class III based on the molar relation. Class I malocclusion is most prevalent in people compared to class II malocclusion. (Abbassy and Abushal, 2015) Class II Malocclusion may reflect maxilla-mandible skeletal disharmony, leading to a convex soft tissue profile. They can be caused due to maxillary excess or mandibular deficiency or both. Class II malocclusion is subdivided into class II division 1 and Class II division 2 (Paduano *et al.*, 2020). Class II div 1 malocclusion have characteristics like protrusive incisors with narrow maxillary arch accompanied by abnormal function of the lips, nasal obstruction and mouth breathing. Class II div 2 malocclusion is characterised by retroclined incisors, decreased lower face height, lower mandibular plane angle, decreased gonial angle (Li *et al.*, 2015). It has been estimated that one third

of all orthodontic patients are treated for class II malocclusion (Hellman, 1931). The incidence of malocclusion in a particular population is necessary for planning preventive and interceptive orthodontics (Smith and Burstone, 1984).

Malocclusion prevalence varies from population to population and it is important to decide treatment modalities based on severity of malocclusion (Uribe and Nanda, 2003). Studies have been conducted on prevalence of class II malocclusion across different populations, (Lau and Hägg, 1999; Sachan, Srivastav and Chaturvedi, 2012; Rana et al., 2017). Class II malocclusion can be treated through orthopaedic procedures for skeletal malocclusion in growing patients, orthognathic surgical procedures for skeletal malocclusion in non growing patients and orthodontic procedures with or without extractions for camouflage or for correction of dental malocclusion. It is necessary for the practitioner to know the prevalence and local norms which can immensely help in creating a customised treatment plan based taking into considerations the ethnic variations.

Our team has conducted various comparative studies/reviews (Ramesh Kumar et al., 2011; Dinesh et al., 2013; Sivamurthy and Sundari, 2016; Felicita, 2017a, 2017b; Samantha et al., 2017), in vitro studies (Sandhu, Sandhu and Bansal, 2012; Felicita, Chandrasekar and Shanthasundari, 2013; Pandian, Krishnan and Kumar, 2018) and cohort studies (Jain, Kumar and Manjula, 2014; Kamisetty et al., 2015; Krishnan, Pandian and Kumar S, 2015; Rubika, Sumathi Felicita and Sivambiga, 2015; Vikram et al., 2017; Felicita, 2018) over the past 5 years. The main aim of the study is to find out the prevalence of dental class II relation among permanent dentition patients.

#### **MATERIALS AND METHODS:**

This retrospective study was set in a university hospital based setting. Ethical approval was obtained from the Institutional Ethical committee of the University (Ethical approval number - SDC/SIHEC/2020/DIASDATA/0619-0320) for collecting patient records for the study. Consent to use treatment records for research purposes were obtained from patients at the time of patient record taking for dental needs. The retrospective data were collected by obtaining and analysing the dental case records of the university from June 2019 to March 2020.

The inclusion criteria for the current study were patients above 12 years age in their permanent dentition with complete intraoral examination records including photographic records. Permanent dentition patients with all permanent first molars present were included in the study. Patients with missing/extracted/grossly deformed permanent first molars and patients with incomplete records were excluded from the study. 37756 case sheets were reviewed and cross verified by two of the examiners along with intra oral photographs to select the study population. Data of the patient's gender, molar relation and type of malocclusion were tabulated in the excel sheet. All patients with Class II molar relationship were separated from the total list of included patients. The class II patients were further segregated into Class II div 1 and Class II div 2 groups. Statistical analysis was done using Statistical Package for the Social Sciences software (version 25). Descriptive statistics were done and Chi square test was done between type of malocclusion and gender.

#### **RESULTS AND DISCUSSION:**

Out of 37,756 patients with permanent dentition who reported to our dental hospital, 1017 (2.69%) patients had Class II malocclusion. [Figure 1]. Out of 1017 Class II malocclusion patients, there were 538 males and 479 females. Chi square test showed no significant difference in gender distribution among patients with Class 2 malocclusion with 52.95% males and 47.05% females ( $p = 0.564$ ). [Figure 2] Among all class 2 malocclusion in permanent dentition, 88% had Class II div 1 malocclusion and 12% had Class II div 2 malocclusion [Figure 3]. Among all Class II malocclusion patients, 45.48% males and 42.51% females had Class II div 1 malocclusion and 7.43% of males and 4.52% females had class II div 2 malocclusion.

Celikoglu(Celikoglu, Akpinar and Yavuz, 2010) stated that, in his study on Turkish population, class II malocclusion was seen in 38.3 % population, which is considerably higher to our population results, but

the ratio of Class II div 1 to Class II div 2 was similar to our study. Alhammadi (Alhammadi et al., 2018) reported that prevalence of class II malocclusion in European population to be 33.51%. In Alajlan's study (Alajlan et al., 2019), he reported that 21.3% of Saudi Arabian population had class II malocclusion. According to (Borzabadi-Farahani, Borzabadi-Farahani and Eslamipour, 2009) study, Class II malocclusion was seen in 27.5% of urban Iranian population, out of which 87.6% was class II div 1 type malocclusion and 12.4% was class II div 2 malocclusion. In aikins and onyeaso's study (Aikins and Onyeaso, 2014), they stated that out of 620 school children, 6.3% had class II malocclusion which is similar to our study results. 61.9% of children had class II div 1 type malocclusion and 38.1% of children had class II div 2 type malocclusion. In Rana's study (Rana et al., 2017) done on the North Indian population, found the prevalence of class II div 1 malocclusion occurred in 29% of North Indian population. Whereas in our study, only 2.69% had class II malocclusion. When compared to our study results, the prevalence of Class II Malocclusion was higher in most of the studies except the aikins and onyeaso's study (Aikins and Onyeaso, 2014). This might be due to the ethnic and racial variation in prevalence of malocclusion even within the same country.

One of the limitations of the study includes sample size confined within a single institution. Hence multicentric study with larger sample size all around the country, might help in finding prevalence of class II malocclusion in different regions around the country.

#### **CONCLUSION:**

In our study, the prevalence of Class II malocclusion was less in our population and was found to be 2.69% among permanent dentition with almost equal distribution between males and females. Within Class II malocclusion, Class II div 1 malocclusion was seen in 88 % population and Class II div 2 in 12% population.

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#### **AUTHOR CONTRIBUTIONS:**

First author [Karthikeson. P.S] contributed to the conceptualization of study, data collection, data analysis and writing of the manuscript. Second author [Dr.Arvind Sivakumar] contributed to the conception of study, data analysis, interpretation and critical revision of the manuscript. [Dr Kiran Kumar] contributed in data analysis and critical reviewing of the manuscript.

#### **CONFLICT OF INTEREST:**

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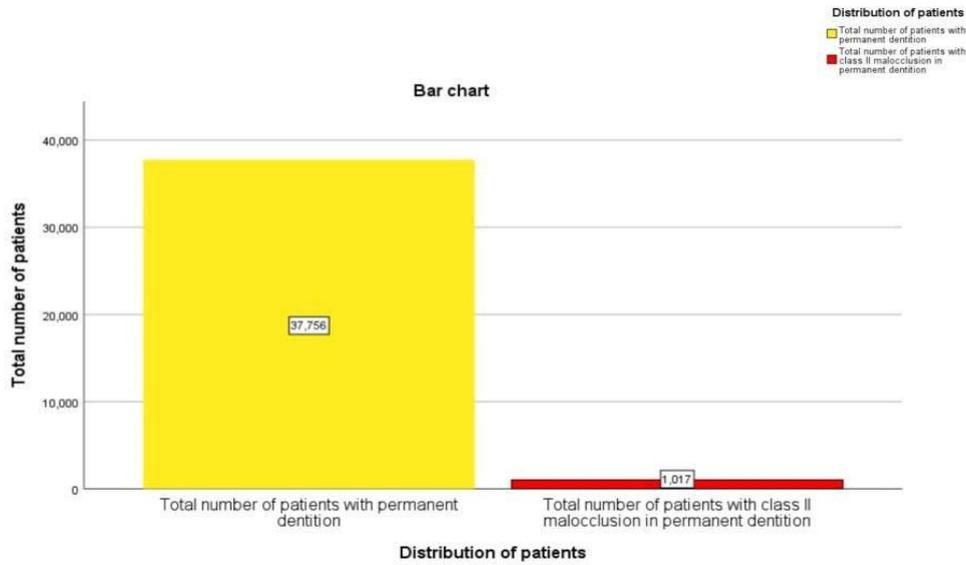


Figure 1: Bar graph represents total number of patients with permanent dentition and total number of class 2 patients with permanent dentition. X axis represents distribution of patients and Y axis represents total number of the patients. There are 37756 patients with permanent dentition (Yellow) out of which, 1017 patients have class II malocclusion (red).

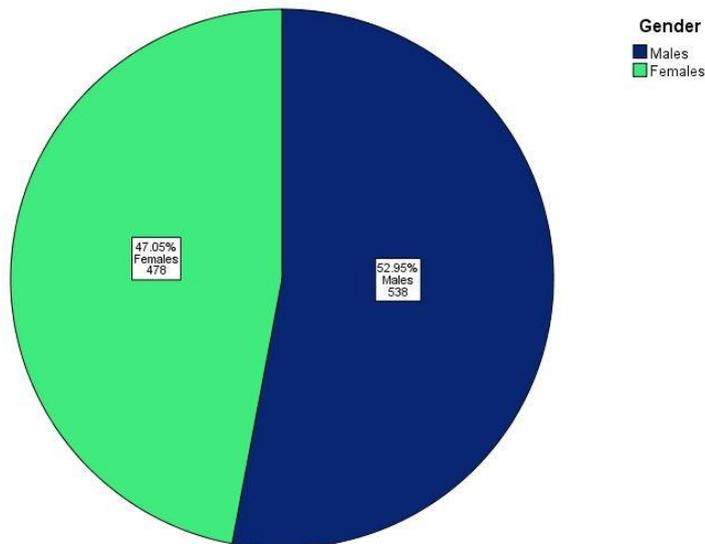


Figure 2: Pie chart represents gender distribution among permanent dentition patients with class 2 malocclusion. Out of 1017 patients, 52.95% were males (Blue) and 47.05% were females (Green).

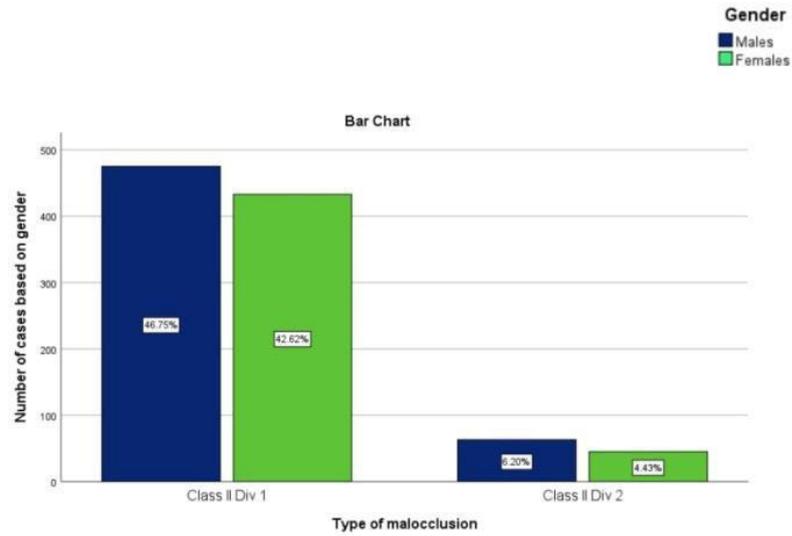


Figure 3: Bar graph represents the total number of patients with class 2 malocclusion in permanent dentition with 88% class II div 1 and 12% class II div 2. X axis represents distribution of malocclusion based on type and Y axis represents number of cases based on gender. Chi square test done between type of malocclusion and gender was found to be not significant with P value of 0.564 ( $p > 0.05$ ).