

## DEEP BITE: FREQUENCY AND PATTERN

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### ABSTRACT

*Deep bite is an abnormally increased vertical overlap of upper and lower incisal teeth in centric occlusion, with or without palatal tissue trauma. The purpose of current study was to find out the frequency and pattern of deep bite among the patients visiting department of Orthodontics, Faisalabad medical university and de, Montmorency College of dentistry. Orthodontic plaster model and lateral cephalograms records of 200 subjects were included as per selection criteria. The data were statistically analyzed by SPSS (19.0). Duration of study was from 2016 November to October 2017. The mean age of the sample was 18.32±3.44 years. The frequency of deep bite was found to be 25% with more patients being females. As far as the distribution of 25% patients in different categories of deep bite, maximum number of patients was having mild to moderate degree of deep bite. It was concluded that female are more affected by deep bite malocclusion and frequency of deep bite malocclusion was found out to be 25%.*

**Key Words:** Deep bite; Over bite.

### INTRODUCTION

Deep bite can be defined as excessive vertical overlapping between the maxillary and mandibular incisal teeth when teeth are in centric occlusion, with or without associated palatal tissue trauma.<sup>1</sup> Deep bite malocclusion is multifactorial, usually caused by interaction of genes related and environment related factors.<sup>2-4</sup>

Several clinical and cephalometric factors associated with development of deep bite malocclusion are Incisor supra-occlusion, excessive horizontal overlapping of incisors, molar infra-occlusion, increased mandibular ramus height, and short vertical facial type.<sup>1</sup>

Deep bite has been declared one of the most difficult malocclusion to treat with 100% success and stability

thus requires permanent retention.<sup>5</sup> Deep bite can be treated in many ways such as anterior bite plane/turbo, intrusion auxiliary arch wires, bite jumping therapy, functional appliance therapy and currently, temporary anchorage devices.<sup>6-13</sup> Deep bite malocclusion got certain clinical implications including abnormal mandibular functions and T.M.J disorders.<sup>14,15</sup>

Identifying deep bite frequency and pattern in different populations can guide us to find out the resources and manpower needed for certain population/area. In view of the fact that the frequency of deep bite malocclusion in different population is different; present study was designed to calculate the frequency of deep bite malocclusion and its gender distribution in our local Pakistani population. The concluded data will be helpful to compare the result of present research with that of different populations.

To our knowledge very few multi-centric studies has been conducted in recent years on subject of frequency and pattern of deep bite malocclusion in Pakistani population. Results of present research can be applied in planning public oral health related missions, estimating resources and funding information regarding deep bite malocclusion. It will further provides knowledge about the orthodontic needs of Pakistani population and will also helps in designing prevention and management strategies of deep bite malocclusion. Therefore, the purpose of current study was to find out the frequency and pattern of deep bite among the patients visiting department of Orthodontics, Faisalabad medical university and de' Montmorency College of dentistry.

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**Received for Publication:** November 30, 2017

**Revised:** January 10, 2018

**Approved:** January 11, 2018

**METHODOLOGY**

This cross sectional study was conducted after institutional approval and taking informed consent at the Department of Orthodontics, Faisalabad Medical University and de, Montmorency College of Dentistry, in which orthodontic records of 200 untreated patients were included to determine the frequency of deep bite. Duration of present study was January 2017 to October 2017.

**Inclusion Criteria**

- All teeth fully erupted except 8s
- Patients presenting in Orthodontic OPD
- Chronological ages 14 to 24 years

**Exclusion Criteria**

- Any history of orthodontic/dental treatment
- Any craniofacial issues
- History of dentofacial trauma
- Tooth wear

**Data Collection Procedure**

The amount of deep bite was calculated by measuring the amount of vertical overlapping of anterior incisal teeth, with standardized digital vernier callipers on plaster models (0.01 mm accuracy). Scoring of the 200 study casts were done, to evaluate the pattern of deep bite malocclusion as per following criteria.<sup>16</sup>

**Score Overbite severity**

- 0 < 1/3 coverage of lower incisors by uppers
- 1 1/3 to 2/3 coverage of lower incisors by uppers
- 2 2/3 up to 100% coverage of lower incisors by uppers
- 3.0 100% covered lower incisors by uppers

Lateral cephalograms were used to confirm the presence of deep bite. The 200 study casts were divided into groups depending on the amount of vertical overlap of anterior incisal teeth.

- Normal Over bite Over bite Score 0.0
- Deep bite Over bite Score 1, 2, 3

**Statistical Analysis**

The data were analyzed in Statistical Package for the Social Sciences software package (SPSS) 19. The mean age, gender distribution and percentage of deep bite among the selected sample was calculated.

For reliability, 30 sets of study casts were randomly selected from the main sample and were reassessed 10 days after the initial assessment. Data were found to be having good reliability and repeatability.

**RESULTS**

The mean age of the patients was 18.32±3.44 years. (Table 1) Frequency of deep bite was found out to be 25%, out of 50 deep bite patients 38 were females and 12 were males. (Table 2) Out of 50 deep bite patients, 30 patients had 1/3 to 2/3 lower incisor coverage, 12 patients showed 2/3 up to full coverage of lower incisors, while 8 patients were found to have full coverage. (Table 3) Out of 50 deep bite patients, only 4 patients had associated soft tissue trauma to be palatal tissues. (Table 4)

TABLE 1: DESCRIPTIVE STATISTICS OF AGE (YEARS) (N=200)

	N	200
	Mean	18.32
Age (years)	SD	3.44
	Minimum	14
	Maximum	24

TABLE 2: PREVALENCE AND GENDER DISTRIBUTION (N=200)

Parameter	Prevalence (%)
Deep bite Patients	25%
Males having deep bite	24%
Females having deep bite	76%

TABLE 3: OVERBITE SEVERITY PATTERN (N=50 DEEP BITE PATIENTS)

Parameter	Pattern (%)
1/3 to 2/3 coverage (Score 1)	60%
2/3 up to fully covered (Score 2)	24%
100% covered (Score 3)	16%

TABLE 4: OVERBITE SEVERITY PATTERN

Parameter	Pattern (%)
Overall deep bite patients	25%
100% deep bite patient	16%
Palatal trauma	2%

**DISCUSSION**

Vertical overlap of more than 2-3 mm between upper and lower incisal teeth is known as deep bite. The epidemiological literature on any dental malocclusion is of utter importance for any public oral health related

missions, management strategies, screening purposes, resource planning and funding. Present cross sectional study was conducted after institutional approval, involving 200 untreated patients, between the ages of 14 and 24 years to determine the frequency and pattern of deep bite malocclusion. The mean age of the overall sample was  $18.32 \pm 3.44$  years.

Frequency of deep bite malocclusion was found out to be 25%. Out of 50 deep bite subjects 38 were females and 12 were males. This might be due to the fact that females are more concerned of orthodontic condition of their teeth than males, in our population setup, which is in accordance with findings of certain other studies.<sup>17,18</sup> Findings of frequency of present study on deep bite was different from findings of the other international<sup>19,20</sup> and local studies,<sup>18,21-23</sup> the difference of results can be due to the differences in the methodology, sample size, racial differences, genetics differences, and difference in need of orthodontic treatment in different populations.

Out of 50 deep bite patients, 30 patients had 1/3 to 2/3 lower incisor coverage, 12 patients showed 2/3 up to full coverage of lower incisors, while 8 patients were found to have full coverage, this is in agreement with findings of study by Naeem et al who showed similar percentages of deep bite prevalence.<sup>18</sup> According to a study conducted by Proffit in 2007, overbite > 5 mm was found in twenty percentages of kids and thirteen percentages of the adults.

Out of 50 deep bite patients, 4 patients had associated soft tissue trauma to be palatal tissues. Results of present study got certain clinical implications. Subjects with mild type of deep bite usually require no management, except in cases of psychological trauma because of esthetic appearance. 100% overbite on the other hand, is considered as a clinical issue that should be corrected through orthodontic intervention on emergency basis, because if severe traumatic bite left untreated could lead towards periodontal problems, tooth wear, as well as traumatizing the tissues of palatal aspect of upper incisal teeth thus interfering with incision and mastication.

The limitation of current study are cross sectional design and small sample size; however, further mass level scale studies are advised to further calculate the incidence and prevalence of deep bite patients in Pakistani population. We did not investigate the etiological factors of deep bite malocclusion nor did we observe whether the deep bite was skeletal or dental in nature. We will focus on these aspects in the future multi-centric studies involving larger number of subjects.

## CONCLUSION

It was concluded that

- Female are more affected by deep bite malocclusion
- Frequency of deep bite was found out to be 25%
- Most of the patients had mild to moderate degree of deep bite
- 2% sample was having traumatic deep bite.

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- 4 Usman Shakoor:** Analysis and interpretation of data.
- 5 Arshad Mehmood:** Conceiving and designing the study.
- 6 Muhammad Imran Khan:** Analysis and interpretation of data.