Comparison of group function occlusion and canine guided occlusion among partially edentulous patient – A retrospective study

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ABSTRACT
Group function occlusion, as well as Canine guided occlusion, are important in the field of prosthodontics. The study about the occlusion includes not only the static relationship of teeth, but it also includes the functional interrelationship and all the components of the masticatory system. The aim of the study is to compare group function occlusion and canine guided occlusion among partially edentulous patients. The study was conducted in the outpatient of Dental College and Hospital. The data was reviewed and analysed from the total number of 86000 patients between June 2019- March 2020. The data includes both group function occlusion and canine guided occlusion patients with a partially edentulous condition. Then the data was manually verified by 1-2 reviewers and finally tabulated, and SPSS imported and got the results. 522 Data was included in that males are 55.7% and females are 44% and 0.1% transgender. In that majority of them belong to the age group (31-40) yrs. The group function occlusion is 59.5%, and canine guided occlusion is 40.42%, This shows that Male predominant is seen with group function occlusion. Overall, the results showed that in partially edentulous conditions, the canine guided occlusion is more prevalent in male gender when it is compared with group function occlusion.

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INTRODUCTION
The Gnathological concepts of occlusion were exposed in dentistry or other fields. The study about occlusion includes the static relationship of teeth, functional interrelationships and all other masticatory components also. All restoration may be the amalgam filling, crown and bridgework that always involve the occlusal surface, and it also affects the occlusion (McCullock, 2003; Ajay, 2017). The synchronization of impediment during the development of the mandible is kept up by the back teeth that don't interfere with inverse teeth. The posterior teeth rely upon the front tooth for the security in this way foremost direction is of impressive significance. The anterior guidance was divided into group guided, canine guided and balanced occlusal schemes (Al-Nimri et al., 2010; Ashok, 2014). While the lower arch moves horizontal, the posterior teeth leave their centric contact...
with upper teeth, and it tends to move sideways down which was directed by the condyle at the posterior and by the sidelong foremost direction in front. In the various articles on occlusion and on the functional of masticatory systems, these are two important concepts that stand out (Panek, 2008; Ashok and Suvitha, 2016).

Canine-guided occlusion is a stated as protected occlusion in this the horizontal as well as the vertical overlap of the canine teeth will result in withdrawal of the mandibular posterior teeth in the lateral movement. The group function occlusion depends on the maxillary and mandibular teeth multiple contacts in the lateral movement on the working side (Davies and Gray, 2001; Basha et al., 2018). Canine-guided occlusion is speculated that it protects the posterior teeth laterally. This is due to the location of canines’ strategic, proprioceptive properties and anatomy. On the other hand, the group function occlusion may result in widespread occlusion of forces applied on many teeth rather than a single tooth that increases the occlusion functional as well as more comfortable (Thornton, 1990; Ganapathy, 2016). Both the group function and canine protection was used for occlusal contact pattern classification in the lateral excursions in the original tooth (Jyothi, 2017; Ganapathy et al., 2017).

The designing and manufacturing of the canine guide are not that easy. Still, it includes less activity of muscles and minimum pressure on the teeth when it is compared with group function (Selvan and Ganapathy, 2016; Venugopalan, 2014). The use of various methods of Sensitivity, reliability, and validity to find out the occlusal contacts is an important concern because the inconsistent examination methods can show the opposite function of occlusal contacts in the disorder that includes TMJ, periodontal disease and bruxism (Shenoy, 2013; Kannan and Venugopalan, 2018). There are three main concepts in the dynamic occlusal relationship regarding the contact of the tooth during the lateral excursion movement of mandibular movement, i.e. canine guidance, balanced occlusion and group function (Vijayalakshmi and Ganapathy, 2016; Ariga, 2018). In reality, the canine guidance is the best physiology than all other occlusal relationships. This is due to the protection of teeth from wear and prevention from bruxism. Group function occlusion is more prone for bruxing habits that will result in greater and greater wear on all teeth (Moses, 1953; Jain et al., 2017). The lingualized occlusion, as well as canine-guided occlusion, can be used in the fabrication of complete dentures successfully. And the Canine guided occlusion found to be satisfactory. An implant-supported prosthesis is advised for the mandibular arch, group function or mutually protected occlusion is advised (Duraisamy, 2019; Selvan and Ganapathy, 2016). In this study, we have compared group function occlusion and canine guided occlusion among partially edentulous patients.

MATERIALS AND METHODS

The study was conducted in the outpatient of Dental College and Hospital. The study consisted of 522 patients between the age group of 18-83 yrs. This is because the available data with similar ethnicity was collected from a particular geographic location. The trends in the other location were not assessed in the study setting. Ethical approval was done by the universal ethical committee before the start of the study. The approval number given was [SDC/SIHEC/2020/DIASDATA/0619-0320]. The data was reviewed and analysed from the total number of 86000 patients between June 2019- March 2020. The case sheet was manually reviewed and cross-verified to avoid errors. To minimise the sampling bias, all available data were included, and the sorting process was done. All the samples diagnosed as partially edentulous patients with group function and canine guided occlusion were included. This particular time was considered as internal validity, and a prescriptive pattern was followed to analyse external validity. All the data like the patient’s name, age, gender and their field value was included in the study. The data which are obtained were entered in the excel sheet and tabulated, and finally, SPSS imported was done, including the chi square test.

RESULTS AND DISCUSSION

In this present study, 522 patients data was taken as the study sample size in which their age ranges from (18-83)yrs.

The data are manually verified by 1-2 reviewers, and then finally it is tabulated, and SPSS imported to obtain results. The incomplete data was verified from the concerned department, and the gross incomplete is not included in the study.

Table 1 shows that males are 291(55%) out of this 21.6% has group function occlusion, and remaining 34.1% has canine guided occlusion. In contrast, females are 230 (44%) out of this 18.7% has group function and remaining 25.2% has canine guided occlusion, and one transgender person has canine guided occlusion, and transgender 0.1% has canine guided occlusion. Therefore canine guided occlusion is more than group function occlusion in Male
gender compared to the female gender.

Chi square test done showed that there was no statistically significant difference between gender and field value (Pearson chi-square value- 0.487, DF:2, p>0.005).

The Table 2 shows that the 76 (14.5%) of them have group function occlusion and 90 (17.2%) of them has canine guided occlusion under the age group (31-40) yrs.

Chi square test done showed that there was no statistically significant difference between age and field value (Pearson chi square value- 0.468, DF:7, p>0.005).

The Table 3 shows that Male patients with the partially edentulous condition are 14.3% among age group (31-40) yrs. And one transgender person belongs to the age group (81-90) yrs.

Chi square test done showed that there was no statistically significant difference between age and gender (Pearson chi square value-0.074, DF:14, p>0.005).

In our study, there were 522 partially edentulous patients data taken. Among them, Males are 291(55.7%), and females are 230(44%) and 1(0.1%) transgender patients. Males with group function occlusion are 21.6%, and canine guided occlusion is 34.1%. Females with group function occlusion are 18.7%, and canine guided occlusion is 25.2%.

One transgender person has canine guided occlusion (Figure 1). Thus the total canine guided occlusion is 59.5%, and group function occlusion is 40.4%. And the majority of them are under the age group 31-40 yrs (Figure 2). This shows that canine guided occlusion is more predominant occlusion among males compared to females. (Figure 3) shows that majority of Males with partially edentulous belong to 21-30yrs and Females with partially edentulous belong to 31-40 yrs, and Transgender with partially edentulous belong to 21-30yrs.

In their study, 600 individuals were selected with an age range from 15-50 year. The mean age was found to be 26.6. Out of this, 375 (62.5%) were females, and 225 (37.5%) were males. The female to male ratio was 1.6:1. Out of 225 males, 126 exhibit canine guided while 99 showed group guided occlusion. In 375 females, 206 had canine guided while the remaining 169 showed group guidance. Canine guided and group guided was also
Table 1: Frequency distribution of gender and field value (group function & canine guided occlusion)

| Gender     | Group function occlusion | Canine guided occlusion | Total |
|------------|--------------------------|-------------------------|-------|
| MALE       | 113                      | 178                     | 291   |
| FEMALE     | 98                       | 132                     | 230   |
| TRANSGENDER| 0                        | 1                       | 1     |
| TOTAL      | 211                      | 311                     | 522   |

Table 2: Frequency distribution of age and field value (group function & canine guided occlusion)

| Age        | Group function occlusion | Canine guided occlusion | Total |
|------------|--------------------------|-------------------------|-------|
| 11-20yrs   | 9                        | 13                      | 22    |
| 21-30yrs   | 58                       | 89                      | 147   |
| 31-40yrs   | 76                       | 90                      | 166   |
| 41-50yrs   | 28                       | 60                      | 88    |
| 51-60yrs   | 25                       | 40                      | 65    |
| 61-70yrs   | 12                       | 12                      | 24    |
| 71-80yrs   | 3                        | 6                       | 9     |
| 81-90yrs   | 0                        | 1                       | 1     |
| TOTAL      | 211                      | 311                     | 522   |

Table 3: Frequency distribution of age and gender

| Age        | Male | Female | Transgender | Total |
|------------|------|--------|-------------|-------|
| 11-20yrs   | 16   | 6      | 0           | 22    |
| 21-30yrs   | 98   | 48     | 1           | 147   |
| 31-40yrs   | 91   | 75     | 0           | 166   |
| 41-50yrs   | 40   | 48     | 0           | 88    |
| 51-60yrs   | 32   | 33     | 0           | 65    |
| 61-70yrs   | 9    | 15     | 0           | 24    |
| 71-80yrs   | 5    | 4      | 0           | 9     |
| 81-90yrs   | 0    | 1      | 0           | 1     |
| TOTAL      | 291  | 230    | 1           | 522   |

statistically insignificant in gender (p>0.05) (Aslam et al., 2018).

In our study, there were 311 individuals with canine guided occlusion and 211 with group function occlusion out of a total 522 sample size. Whereas in their study, they found most of the subjects (81 per cent) exhibited lateral working side cuspal contact. And only 19% has protected canine occlusion (Weinberg, 1964).

In our study, there was no statistically significant difference between field value (group function and canine guided occlusion) with age group and gender. Like that in their study, they observed no statistically significant difference between the canine protection and group function group for masticatory efficiency. Therefore, a balanced occlusion group presented, with statistical significance (p<0.05) increased masticatory efficiency than group function and canine protected occlusion group (Rao, 2010).

Limitations

There are certain limitations to our study. There is a small sample size used which cannot be generated for a large population. And the study doesn't represent the ethnic group and population.

Future Scope

The study should be done in a larger population. Multicentered study should be done, including other criteria.
CONCLUSIONS

Within the limitations of our study, we conclude that partially edentulous conditions were found more common among males compared to females and transgender and the canine guided occlusion was found to be more prevalent in males, females, and transgender when it was compared with group function occlusion. Overall the prevalence of canine guided occlusion was found in male gender compared to group function occlusion, and partially edentulous condition was more prevalent among 31-40 years of age group. Further, the research can be carried out in large populations with different ethnicity.

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Conflict of Interest

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