Type of research : *Retrospective study.*

Prevalence of Kennedy Classification in Partially Edentulous Patients - A Retrospective Study

Tulsani Minal Gopal, Subhashree. R

[1]Research Associate, Dental Research Cell, [2]Senior Lecturer, Department of Prosthodontics, Saveetha dental college and hospital, Saveetha institute of medical and technical science, Saveetha university, Chennai.

Abstract

The aim of the study is to evaluate the prevalence of partial edentulism according to Kennedy's classification in the South Indian population. A retrospective study was done in which 1419 removable partial dentures were fabricated from 1 June 2019 till 1 March 2020 were included. Data was reviewed from the patients records and analysed the data of 86,000 patients between June 2019 and March 2020 that were documented in a private institution. The data was analyzed using descriptive statistics and Chi square test and pearson correlation was done for checking correlation between age, gender and type of classification. Out of 1419 removable partial dentures, 58.4% were fabricated for males. Class III had the highest prevalence overall and in males and females. There was no significant relation between the type of Kennedy classification of partially edentulous patients with age and gender. Prevalence of Kennedy's Class III was the most common in the South Indian population. The prevalence was more in patients above 50 years of age. Male had more prevalence than females. Gender and age did not affect the prevalence of types of Kennedy's classes.

Keyword: *Partial edentulous, Missing teeth, Classification, Kennedy's classification.*

Introduction

Partial edentulism is when one or more teeth are missing. There are various causes for partial edentulism like caries, truma, periodontal problems, congenitally missing, internal resorptions, etc [1–3]. According to many studies, caries is the main cause of tooth extraction [4–7]. Bruce et al [8], also found that incidence of tooth loss due to caries is about 83% and due to periodontal problems is 17%. Caries mainly occur when the existing prosthesis has open margins which can lead to destruction of the tooth [9,10]. Partial edentulism causes problems for patients and the dentist. Patient related problems are decreased self esteem, lifestyle compromises, inability to eat, esthetic compromises, etc [11,12]. Clinical complications include drifting of teeth, supraeruption of opposing dentition, reduced space due to tipping of the abutments into the edentulous space, loss of occlusion, spacing between the teeth, alteration in speech, temporomandibular disorders, loss and degradation of alveolar bone of edentualous space and adjacent teeth, etc [1,13–18]. Treatment for partial edentulism can be removable or fixed depending on patients choice. Fixed options include Fixed partial dentures and implants [19,20].

Partially edentuous patient have different number and location of the missing teeth and their relation to the natural teeth, there are possibly more than 65000 combinations of partial edentulism in both arches, hence its important to classify them for easy communication between dentists, students and between dentist and laboratory technician [7,14,21–24]. Various classifications are available for partially edentulous patients like Beckett, Godfrey, Swenson, Avant, Cummer, Kennedy, Applegates, Friedman, Neurohr, Bailyn, Wild, Skinner [6,25,26]. Kennedy classification is the most widely accepted classification as it has visual representation of all the classes, easy to communicate, classifies both tooth and tissue born edentulism [25,27–31].

Kennedy's classified partial edentulism into: Class I: Bilateral edentulous space presents posterior to the remaining natural teeth, Class II: Unilateral edentulous space present posterior to the remaining natural teeth, Class III: Unilateral edentulous space with natural teeth both anterior and posterior to it, Class IV: Single edentulous area present in anterior to remaining natural teeth crossing the midline [32,33]. Kennedy classification was done according to order of the incidence of the type of partially edentulism present at that time. Hence, this

study was done to evaluate the prevalence of partial edentulism according to Kennedy's classification in the South Indian population.

Materials and Methods

A retrospective study was done in a private institution. Ethical clearance number was SDC/SIHEC/2020/DIASDATA/0619-0320. The clinical portion of this retrospective study was conducted over a 9 month period i.e from 1 June 2019 to 1 March 2020 and included patients who had undergone replacement of missing teeth with removable partial denture. A total of 1419 removable partial dentures were evaluated for the prevalence of partial edentulism according to Kennedy's classification

2.1.Inclusion Criteria : Age of 20–60 years irrespective of gender, race, community and socioeconomic status having partially edentulism in either maxilla, mandible or both the arches.

2.2.Exclusion Criteria: Patients having complete edentulism and missing third molars.

The data of 86,000 patients documented between June 2019 and March 2020 were reviewed and analysed. The data collected of partial edentulism of each patient was recorded and tabulated according to Kennedy's based on the groups - gender and age. To evaluate the prevalence of partial edentulism in the South Indian population according to Kennedy's classification based on age and gender. Statistical analysis was done using SPSS Statistics Software for windows, version 20.0. The data was analyzed using descriptive statistics and Chi square test and pearson correlation was done for checking correlation between age, gender and type of classification

Results and Discussion

Out of 1419 removable partial dentures, 32.3% were fabricated for patients in the age group of above 55 years. 58.4% of the removable partial dentures were fabricated for Males. Out of the total population 23.2% of the population had Kennedy Class III edentulous space, which had the highest prevalence (Graph 1).

Prevalence of Kennedy classification in partially edentulous patients according to gender showed that Class III had the highest prevalence in males (23.6%) and females (22.7%) (Table 1, Graph 2). Prevalence of Kennedy classification in partially edentulous patients according to age showed the highest prevalence of Class III in 36-45 years of patients (Table 2). Chi square test showed no significant difference in type of kennedy classification according to age and gender.

Partially edentulous cases can be easily classified for easy description and communication [34]. In our study, Kennedy classification was used because it is simple, easy for communication, picturaistic, logical, known worldwide, most common classification used. The present study was done to assess the prevalence of a type of Kennedy classification occurring in partially edentulous patients attending a private institution.

In our study the prevalence of partial edentulism was more in patients above 50 years of age. These results were similar to results obtained by Gad et al and Gupta et al [29,35,36]. There was no significant age difference in type of Kennedy classification for partially edentulous patients. But there are studies in literature which had correlation seen between age and type of Kennedy classification for partially edentulous patients. The frequency of males who underwent treatment for partial edentulism was more than that of females. Similar results were obtained by Owall et al [37]. Study done by Rana et al and Sapkota et al [36,38] showed more frequency in females compared to males. There was no significant gender difference in partially edentulous patients. Similar results were seen by Marcus et al [39]. Study done by Arandi et al showed dissimilar results [40].

Prevalence of Kennedy Class III (23.2%) was highest followed by Kennedy Class II (21.1%). The results for the highest prevalence of Kennedy Class III is similar in many studies done previously [21,40–42]. But a study done by Farahioon et al, showed that the most common prevalence of partial edentulism according to Kennedy's classification was Kennedy Class II. And Gad et al [35], showed that Class I had the highest prevalence. The second most common type varied from one study to another. Least common type of Kennedy class was class IV. This result was similar to study done by Arandi et al [40].

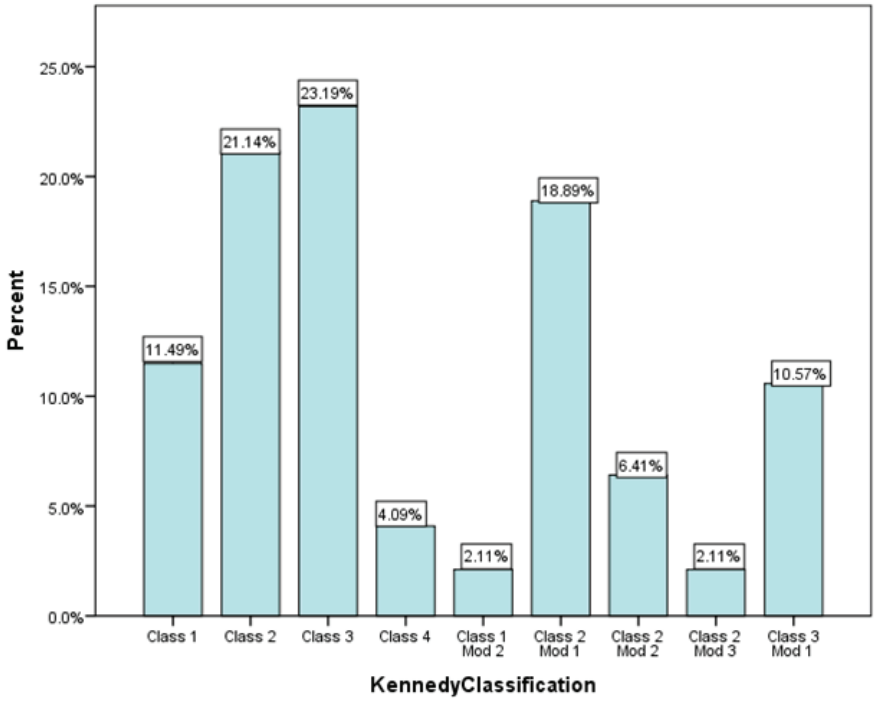
Limitation of our study is that it is done in an institutional setting, hence there are limited samples. Prevalence in maxilla and mandible was not considered in our study.

9.1 Table 1: Association between gender and Kennedy's classification. Chi-square test was done, p value was 0.064 showing that it is statistically not significant, proving that there is no association between gender and type of Kenndy's classification.

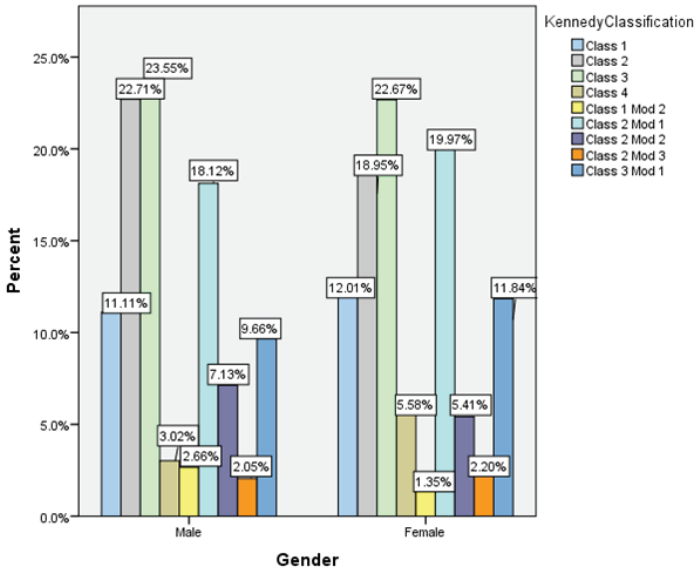
Kennedy's classification	Gender		Chi-square value	p value
	Male	Female		
Class 1	11.1%	12.0%	14.766	0.064
Class 2	22.7%	19.0%		
Class 3	23.6%	22.7%		
Class 4	3.0%	5.6%		
Class 1 Mod 2	2.7%	1.4%		
Class 2 Mod 1	18.1%	20.0%		
Class 2 Mod 2	7.1%	5.4%		
Class 2 Mod 3	2.1%	2.2%		
Class 3 Mod 1	9.7%	11.8%		

9.2 Table 2: Association between age and Kennedy's classification. Chi-square test was done, p value was 1.00 showing that it is statistically not significant, proving that there is no association between age and type of Kennedy's classification.

Kennedy's Classification	Age					Chi-square value	P value
	18-25 yrs	26-35 yrs	36-45 yrs	46-55 yrs	Above 55 yrs		
Class 1	11.1%	10.9%	10.8%	13.0%	10.7%	3.390	1.00
Class 2	22.2%	20.4%	21.2%	20.8%	21.6%		
Class 3	22.2%	23.1%	24.2%	22.5%	23.3%		
Class 4	3.2%	4.1%	4.0%	4.4%	3.9%		
Class 1 Mod 2	1.6%	2.0%	2.4%	2.0%	2.2%		
Class 2 Mod 1	22.2%	19.0%	18.5%	18.8%	18.7%		
Class 2 Mod 2	6.3%	6.8%	6.1%	6.4%	6.5%		
Class 2 Mod 3	1.6%	2.7%	2.0%	2.0%	2.2%		
Class 3 Mod 1	9.5%	10.9%	10.8%	10.2%	10.9%		



9.3. Figure 1: Bar graph showing percentage distribution of type of Kennedy's Classification. X-axis represents the type of Kennedy's Classification and Y-axis represents percentage distribution. The 23.91% distribution was for Kennedy Class III, which was highest.



9.4. Figure 2: Bar graph showing association between gender and Kennedy's classification. X-axis represents gender and Y-axis represents percentage distribution of type of Kennedy's classification according to gender. Sky blue colour represents Kennedy Class 1, Grey colour represents Kennedy Class 2, Pale green colour represents Kennedy Class 3, Golden yellow colour represents Kennedy Class 4, Yellow represents Kennedy Class 1 Modification 2, Electric blue colour represents Kennedy Class 2 Modification 1, Purple colour represents Kennedy Class 2 Modification 2, Orange colour represents Kennedy Class 2 Modification 3, Blue colour represents Kennedy Class 3 Modification 1. Chi-square test was done. Pearson's Chi-square value: 14.766, p value: 0.064 (>0.05), hence, statistically not significant, proving that there is no association between gender and Kennedy's classification.

Conclusion

Prevalence of Kennedy's Class III was the most common in the South Indian population. The prevalence was more in patients above 50 years of age. Male had more prevalence than females. Gender and age did not affect the prevalence of types of Kennedy's classes.

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