ORIGINAL ARTICLE

FREQUENCY OF KENNEDY'S CLASSIFICATION AMONG PARTIALLY EDENTULOUS PATIENTS PRESENTING AT A TERITIARY CARE HOSPITAL IN ISLAMABAD

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ABSTRACT

The objective of the study was to figure out the frequency of Kennedy's classification among partially edentulous patients presenting to the Department of Prosthodontics at Islamic International Dental Hospital, Islamabad. The study design was cross sectional and was conducted over a 6 month period (September 2018-February 2019) on patients reporting to the Prosthodontics Department at Islamic International Dental Hospital, Islamabad. 151 partially edentulous patients were selected using convenience sampling. Patterns of partial edentulousness were recorded according to Kennedy's classification and were registered on to a well-structured proforma. The mandibular data demonstrated a higher recurrence of partial edentulism i.e. 53.5% as compared to maxillary arch which was 46.5% .The overall greatest prevalence of Kennedy's classification was class III. The overall most dominant partial tooth loss trend was found to be Kennedy Class III. Both maxilla (65.7%) and mandible (53.5%) individually showed higher prevalence of Kennedy class III pattern. Moreover the most prevalent combination of Kennedy class was of class III in maxilla alongside Class III in mandible. Women showed higher percentage of partial edentulism than men. According to age, the most prevalent Kennedy class i.e. Class III was found more common in the patients aged 25-50 years. Hence, the present study inferred that amongst the occupants of Islamabad, Kennedy's Class III was the most frequently occurring partially edentulous state irrespective of gender and age.

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INTRODUCTION

The most important constituents of the stomatognathic system are teeth.[1] Teeth play a vital role in diverse functions such as mastication, speech and general appearance which in turn greatly affects the patients' life quality.[1-4]Loss of teeth may have unfavorable effects on the biological, psychological and social life of an individual which are affected when they lose a single or multiple teeth. [3,4]Edentulous spaces form when a single or multiple teeth are lost within an arch and this condition is called partial edentulism,[1,3,4]which may serve as a clue towards the awareness and oral health status of a person or a society.[6]

There exists an estimated 65000 different combinations of edentulous spaces and teeth among maxillary and mandibular arches.[2,15,18] Therefore it is pivotal to classify the partially edentulous conditions.[1,6]For this purpose, many systems have been proposed such as Kennedy's, ICK, Skinner, Bailyn etcetra. Among these, the most commonly followed and widely accepted is the Kennedy's system.[7] In combination with the Applegate rules, Kennedy's classification becomes simple and easy to use with immediate visualization and distinction between tooth supported and tooth-and-tissue supported partially edentulous situations.[1]This system has four main groups namely Class I, Class II, Class III and Class IV in the order of decreasing frequency of their occurrence at the time of its proposal.[2]

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Many studies have been done in the past on frequency of partial edentulism in Pakistani patients.[2-4]However, local data from Islamabad and adjoining regions is still scant. Hence, our motive was to explore the prevalence of partial edentulism in our local population and attempt to classify them according to Kennedy's system on the basis of age, gender and arch.

The benefits of performing this study will be both theoretical and administrative. Theoretically it will provide valuable information regarding the trend of partial edentulism to undergraduate dental students. They will know what patients are expected to be allotted to them in their clinical rotations. Administratively, this information regarding the trend will aid the hospital procurement staff in the ordering specific tooth molds and materials accordingly.

MATERIAL AND METHODS

This was a cross sectional study carried out in the Prosthodontics unit at Islamic International Dental College and Hospital, which is a tertiary care private teaching institute affiliated with Riphah International University Islamabad, Pakistan. The study was conducted through the months of September 2018 to February 2019 gaining consent from the Ethical board of institute. Consecutive non probability sampling technique was used. to include Those patients male and female partially edentulous patients of 20 years or above who were referred to the department for treatment purposes according to the following criteria:were included in the study sample. Any patient with active periodontal disease, syndromic conditions and mental disorders were excluded from the study.

DATA COLLECTION PROCEDURE

At the time of initial reporting to the department, every patient was screened for identifying the partially edentulous condition. At this time, informed consent was obtained for inclusion in the study. Those patients who did not give consent were ~~also~~ excluded. Complete mouth charting was carried out to identify any positive finding such as caries and previous restorations apart from noting the missing teeth. Patients were then allotted for treatment purpose to 3rd year BDS students, House officers or Post graduate residents. After complete history taking and examination, study impressions were made in Alginate (Cavex CA-37 Normal Set Alginate Impression Material, Cavex Holland BV, CJ Haarlem, The Netherlands) and their casts were poured using Hard Plaster (ISI Kopo-Hard CKH-52 Dental Plaster, Kuang Pang, China) These casts were used to identify the corresponding Kennedy's classification as per Applegates rules. The data was recorded on a simple proforma. Afterwards, each patient was given options of either acrylic or cast partial removable dental prosthesis, and the opted treatment was then provided to the patient.

DATA ANALYSIS PROCEDURE

Data analysis was carried out with the help of Statistical Package for Social Sciences (SPSS) version 23 through which descriptive indicators were calculated. The study variables were age groups (Group 1 (26-50), Group 2(51-75) and Group3 (75-100)), gender (male or female), and the corresponding Kennedy's class (Class I, II III or IV with or without modifications). Frequency and percentages were deliberated for qualitative variables (sex, age groups and incidence of Kennedy's classification).

RESULTS

By completion of our research duration a sum of 151 subjects were included in the sample study in which 75 (49.7%) were males and 76 (50.3%) were females. The study sample represented a total of 213 partially edentulous arches out of which 99 were maxillary and 114 were mandibular arches. On the basis of gender, there were 108 arches among males (50.7%) and 105 among females (49.3%).

The dissemination of patients according to age groups and gender is mentioned in Tables I and II respectively. Kennedy's classes distribution in both arches are represented by Tables III and IV correspondingly

DISCUSSION

When the effects of conservative dentistry are being considered among masses, the calculation of proportions and distributions of partial edentulism are critical motivations. Moreover, we acquire valuable evidence about the Prosthodontics desires of patients. This study was implemented on 151 patients who presented to the Department of Prosthodontics at Islamic International Dental Hospital requiring prosthetic treatment.

This study clearly shows that the highest percentage and frequency in both ~~either~~ arches is Kennedy's class III compared to other classes. Our study showed partial edentulism to be more prevalent in mandible than in the maxilla. Curtis et al deduced the same results. [8,15]

Mandibular frequency of partial edentulism(53.5%) was observed to be higher as compared to maxillary arch (46.5%) which is compatible with the conclusions of Naveed *et al*[2]

In our study it was established that the overall most frequent partial edentulism pattern is Kennedy's Class III. Both maxilla (65.7%) and mandible (53.5%) individually showed higher prevalence of Kennedy class III pattern .The researches of Shah *et al* [9]*and* Ziaullah et al[10]demonstrated analogous results, which showed

TABLE 1: DISTRIBUTION OF PATIENTS ACCORDING TO AGE GROUPS AND KENNEDY'S CLASS

Age Group	Kennedy's Class				Total
	Class I	Class II	Class III	Class IV	
Group 1 (26-50y)	9 (7.14%)	11(8.73%)	93(73.80%)	13(10.30%)	126
Group 2 (51-75y)	18 (22.78%)	23(29.11%)	30(37.97%)	8(10.13%)	79
Group 3 (76-100y)	2 (25.00%)	3(37.50)	3(37.50)	0	8

TABLE 2: DISTRIBUTION OF PATIENTS ACCORDING TO GENDER AND KENNEDY'S CLASS

Gender	Kennedy's Class				Total
	Class I	Class II	Class III	Class IV	
M	14 (12.96%)	23 (21.29%)	58 (53.70%)	13(10.30%)	126
F	15 (14.28%)	14 (13.33%)	68 (60.00%)	8(10.13%)	79

TABLE 3: KENNEDY'S CLASSES DISTRIBUTION IN MAXILLA

Partial Edentulism variety	Frequency	Percentage
Class I	12	12.1
Class II	13	13.1
Class III	65	65.7
Class IV	9	9.1
Class 1 mod 1	3	5.9
Class 1 mod 2	5	9.8
Class 1 mod 3	1	2.0
Class 2 mod 1	3	5.9
Class 2 mod 2	6	11.8
Class 2 mod 3	1	2.0
Class 3 mod 1	24	47.1
Class 3 mod 2	6	11.8
Class 3 mod 3	2	3.9

TABLE 4: KENNEDY'S CLASSES DISTRIBUTION IN MANDIBLE

Partial Edentulism variety	Frequency	Percentage
Class I	17	14.9
Class II	24	21.1
Class III	61	53.5
Class IV	12	10.5
Class 1 mod 1	8	16.0
Class 2 mod 1	1	22.0
Class 2 mod 2	21	4.0
Class 2 mod 3	5	2.0
Class 3 mod 1	2	42.0
Class 3 mod 2	8	10.0
Class 3 mod 3	11	4.0

the prevalence of class III in both arches while they also showed greater frequency of class III individually i.e 55% in maxilla and 45% in mandible. One other study completed by Zaigham et al [11]shows predominance of class III in maxillary arch which is in agreement to our findings.

If the modified arches are considered separately, the most dominant Kennedy class with modification was found to be Class III mod 1 in maxillary arch (Table 3) and Class II mod 2 in mandibular arch (Table 4). Anum *et al* described conflicting statistics in which Class III mod 1 was the greatest recurrence in both maxilla (25.7%) and mandible (26.7%). [16] The second most common Kennedy class was Class II and was more common in mandibular arch. Moreover the most common combination was of Kennedy class III in maxilla coupled with Class III in mandible, which was coherent with the research of Al-Dwairi et al[12]which also showed class III to be more common in both arches collectively.

Women showed higher ~~of~~ partial edentulism than male, as also stated in the explorations of Sapkota et al[13]which affirms that the female gender shows partial edentulism more than males. Both genders showed higher prevalence of Kennedy class III trend in both arches trailed by Kennedy class II in males and Class I in females (Table 2). With respect to arches, the Kennedy's class III emerged as the predominant class in maxilla in both genders which was 59%. The total percentage of Kennedy Class III for maxilla as well as mandible in males was 23% each. The total percentage Kennedy Class III for maxilla in females was 28% and that for mandible was 25%. These results are negligibly different from the findings of Prabhu *et al*[14]which indicated a 72% prevalence of class III in mandibular

arch as compared to maxilla which was 71.5%. Moreover gender didn't play any significant role in relation to partial edentulism.

According to age, the most prevalent Kennedy class among all age groups i.e. Group 1 (26-50), Group 2(51-75)and Group3 (75-100), was Kennedy Class III and was found more common in the 25-50 year group. This result is consistent with the research of Yassir A. Araby*et al* in which class III appeared more prevalent in younger age group i.e 78.5% in the age range of 21-30.[17] The second most prevalent class according to age was Class II and was found to be more prevalent in age group 51-75. The fact that this study shows the predominance of class III pattern in younger age group i.e. 25-50 years can be related to the higher number of younger population encountered during sample collection. It is a known fact that with advancing age partial edentulism increases; if higher frequency of older population was examined, the results favoring the prevalence of Class III could have been substituted by some other class in the current study.

Another limitation could be that it only targets a fraction of population residing nearby in Islamabad and some of the distant localities from where non affording patients visit the hospital for free dental treatments , hence the study cannot be claimed to be the representative of entire population of the region. Therefore similar studies should be carried out in different centers of the region and a general database of partial edentulousness and tooth loss patterns be gathered, which will help us to understand and identify the reasons of tooth loss and its prevention.

CONCLUSION

Within the restraints of the present study, it is concluded that the most repeatedly occurring partially edentulous state irrespective of gender and age was Kennedy's Class III.

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3 Sunia Gul:	Data Collection and Discussion
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