PATTERNS OF PARTIAL EDENTULISM ACCORDING TO KENNEDY'S CLASSIFICATION - A CROSS SECTIONAL STUDY

Maleeha Nayyer, Danish Azeem Khan*, Hashmat Gul, Ayesha Aslam*, Nauman Bari Khan, Faiza Aslam**

National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Armed Forces Institute of Dentistry/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, **Foundation University College of Dentistry, Islamabad Pakistan

ABSTRACT

Objective: To evaluate the frequency of various patterns of partially dentate arches according to Kennedy's classification in the local population.
Study Design: Cross-sectional study.
Place and Duration of Study: Prosthodontics department, Armed Forces Institute of Dentistry, from Jan 2017 to Mar 2017.
Methodology: A total of 202 partially edentulous male and female patients presenting to the Prosthodontic Outpatient Department were included. Pattern of edentulism was evaluated by inspection and visual examination of the patient. Arches were classified using Kennedy's classification and Applegate's rules.
Results: Majority 105 (52%) of the patients presented with Kennedy's Class III arches. No significant association was found between arch type (maxillary/mandibular) and Kennedy's classification (p=0.356). However, a significant difference was observed between males and females in terms of frequency of Kennedy's classification (p=0.047).
Conclusion: Kennedy's Class III partially dentate arches were most frequently encountered.

Keywords: Kennedy's classification, Partial edentulism, Removable partial denture.

INTRODUCTION

The importance of teeth as vital constituents of the stomatognathic system cannot be overemphasized[1]. Loss of teeth reflects the standard of general oral health of a population. Loss of one or more teeth disrupts the integrity of the arch and negatively affects the balance of the remaining teeth. It leads to a number of anatomic, esthetic and biomechanical complications, compromising individual's overall health and quality of life[2].

Owing to better health facilities, a greater number of individuals retain their natural teeth into elderly years. In most of the western world, the frequency of edentulism has declined in all age groups over the last two decades. Hence, more and more subjects present with 'partial edentulism' with a loss of one or more but not all teeth. Depending upon the number and location of lost teeth, more than 65,000 patterns of partially dentate arches can be envisaged[3,4].

Over the years, several different systems have been put forward to classify partially edentulous arches. Cummer in 1920 was the first one to attempt such a classification[5]. Other note worthy researchers who proposed classification systems include Bailyn, Neurohr, Godfrey, Miller, Skinner and Kennedy[6]. To date, Kennedy's classification, put forward in 1925 by Edward Kennedy, is the one universally accepted and employed owing to its simplicity, ease of use, ability to differentiate between arches on the basis of support and its application to virtually every possible partially edentulous situation[7-10].

The patterns of tooth loss and their prevalence have been evaluated in a number of different studies for varying populations. Literature suggests that the prevalence of various patterns of partially edentulous arches should be frequently revised and updated. This will help identify the changing treatment needs of the population and provide guidelines for teaching and learning as well. The purpose of this study was to evaluate

Correspondence: Dr Danish Azeem Khan, Department of Prosthodontics, AFID Rawalpindi Pakistan
Email: danishazeemkhan@gmail.com
Received: 02 Aug 2018; revised received: 02 Sep 2019; accepted: 25 Sep 2019

the frequency of different patterns of partially dentate arches according to Kennedy-Applegate classification in the local population. Knowledge thus gained will help improve the quality of prosthodontic care being provided to patients and enhance their oral and general health.

METHODOLOGY

A cross-sectional study was conducted at Prosthodontic Outpatient department, AFID from January to March 2017. Based on previously published data, keeping confidence level (1-α) at 95%, absolute precision (d) at 0.07 and antici-pated

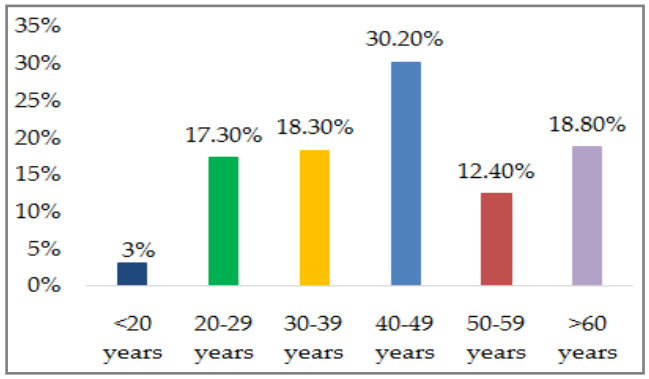

Figure-1: Distribution of patients according to their age groups.

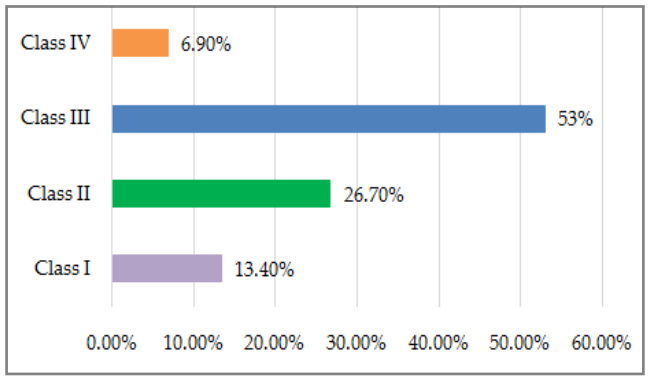

Figure-2: Distribution of patients according to Kennedy's classification.

population proportion (*p*) at 0.56, a sample size of 202 was calculated. Non-probability consecutive sampling was used. Partially dentate, male and female subjects of all age groups were included while completely edentulous patients, or those with fixed prosthesis were excluded. Pattern of edentulism was evaluated by inspection and visual examination of the patient. Arches were classified using Kennedy's classification and Applegate's rules. However, modification areas were not included to avoid complications. Data was analyzed using SPSS version 24. Descriptive statistics were calculated. Post stratification Chi Square-test was used for effect modifiers like gender and arch type. *p*-value <0.05 was taken as significant.

RESULTS

Of the 202 subjects, 91 (45%) were male and 111 (55%) were female. Mean age of the patients was 44.15 ± 14.13 years (range: 18-65 years). Majority (30.2%, n=61) of the patients were in their 40s (fig-1). Majority (53%, n=107) of the patients presented with Kennedy's class III arches

Table-I: Association of frequency of Kennedy's class with type of arch.

Kennedy's Classification	Arch		*p*-value
	Maxillary	Mandibular	
Class I	10	17	0.356
Class II	25	29	
Class III	54	53	
Class IV	9	5	
Total	102	100	

Table-II: Association of frequency of Kennedy's Class with gender.

Kennedy's Classification	Gender (N)		*p*-value (X^2-square)
	Male	Female	
Class I	11	16	0.047
Class II	30	24	
Class III	48	59	
Class IV	2	12	
Total	91	111	

(fig-2). No significant association could be found between arch type (maxillary/mandibular) and Kennedy's classification. However, a significant difference was observed between males and females in terms of frequency of Kennedy's classification. While frequency of class III and class I was similar between the two genders, a significantly higher number of women (10.8%) presented with class IV as compared to men (2.2%). On the other hand, a significantly higher frequency of males (32.9%) presented with Class-II as compared to females (21.6%) (table-II).

DISCUSSION

Determining the prevailing patterns of partial edentulism in a population is necessary to assess their overall prosthodontic treatment needs. Classification systems for partially dentate arches make it easier to document such patterns and simplify the description of possible combinations of teeth in relation to ridge[11-12]. This study was conducted to evaluate the frequency of various patterns of partial edentulism according to Kennedy's classification in the local population.

In the present study, majority (53%) of the patients presented with Kennedy's class-III arches. These findings are endorsed by Naveed *et al*[13] who found that Kennedy's Class-III was the predominant class in both upper and lower arches. Similar results have been reported by Zaigham *et al*[8] Souza *et al*[14] Prabhu *et al*[15]. However, contrasting results were reported by Khalil *et al*[16] who reported class-IV and class-I as the predominant patterns.

In the present study, no significant difference was found in frequency of various classes of Kennedy's classification between maxilla and mandible. All four classes were equally prevalent in both arches. Similar findings have been reported by Charyeva *et al*[17] and Patel *et al*[18] who found similar prevalence of various classes in both maxilla and mandible. Again, varying results have also been reported. Zaigham *et al*[8] and Al-Moaleem *et al*[19] reported increased frequency of class III for maxillary arch alone. Khalil *et al*[16] observed that maxillary arches frequently presented with Class IV pattern while mandibular arches presented with Class I pattern.

In the present study, a significant difference in pattern of partial edentulism was seen between males and females (p=0.04). While frequency of Class-III and Class-I was similar between the two genders, a significantly higher number of women presented with class-IV while a significantly higher frequency of males presented with class-II arches. These results are endorsed by Dwairi *et al*[20] who found that Kennedy's class-II was more prevalent in males than females. However, others reported no significant correlation of gender with pattern of partial edentulism[8,15].

The present study did not correlate patterns of edentulism with causes of tooth loss. It is suggested that further research may be carried out to look in to the prevalent reasons of partial edentulism. Sample size may also be increased, and a more diverse sample may be included. Moreover, prevalence of partial edentulism in comparison to intact dentition may also be evaluated. The knowledge will allow dentists to tailor preventive measures according to population's needs as well as to extend suitable prosthodontic treatment.

CONCLUSION

Based on the findings of this study, the following inferences may be drawn: Kennedy's Class-III partially dentate arches were the most frequently encountered pattern. A significant association was observed between gender and pattern of partial edentulism (p=0.047). No significant difference was seen in frequency of Kennedy's classes between maxillary and mandibular arches (p=0.356).

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. Ehsan MT, Jabeen N, Patoli S. Pattern of partial edentulism among female patients seen at dental department of secondary care hospital, Lahore. Pak Oral Dent J 2015; 35(2): 326-28.
2. Moaleem MA. Patterns of Partial Edentulism and its Relation to Khat Chewing in Jazan Population–A Survey Study. J Clin Diagn Res 2017; 11(3): ZC55-ZC9.
3. Shubita M. Evaluation of partial edentulism based on Kennedy's classification and its relation with age and gender. Pak oral Dent J 2015; 35(4): 750-52.
4. Shah RJ, Diwan FJ, Diwan MJ, Chauhan VJ, Agrawal HS, Patel GC. A study of the emotional effects of tooth loss in an edentulous Gujarati population and its association with depression. J Indian Prosthodont Soc 2015; 15(3): 237-43.
5. Polzer I, Schimmel M, Müller F, Biffar R. Edentulism as part of the general health problems of elderly adults. Int Dent J 2010; 60(3): 143-55.
6. Jeyapalan V, Krishnan CS. Partial Edentulism and its Correlation to Age, gender, socio-economic status and incidence of various kennedy's classes–a literature review. J Clin Diagn Res 2015; 9(6): ZE14-ZE7.

7. Rashid R, Waseem-ul-Ayoub. Partial edentulism and its association with age and gender - A research article. Int J Eng Sci Com 2017; 7(9): 14883-86.
8. Zaigham AM, Muneer MU. Pattern of partial edentulism and its association with age and gender. Pak Oral Dent J 2010; 30(1): 260-63.
9. Al-Johany SS, Andres C. ICK classification system for partially edentulous arches. J Prosthodont 2008; 17(6): 502-507.
10. Galagali G, Mahoorkar S. Critical evaluation of classification systems of partially edentulous arches. Int J Dent Clin 2010; 2(3): 45-52.
11. Hama AM, Mahmood DK, Abdullah AO. Prevalence and assessment of partially edentulism according to kennedys classification in Sulaimani City. Asian J Sci Tech 2016; 7(8): 3367-70.
12. Almutairy AS, Alotaibi FM, Araby YA. Pattern of partial edentulism in correlation to age and gender among a selected Saudi population. Int J Dent Sci Res 2017; 5(1): 1-4.
13. Naveed H, Aziz MS, Hassan A, Khan W, Azad AA. Patterns of Partial Edentulism among armed forces personnel reporting at Armed Forces Institute of Dentistry, Pakistan. Pak Oral Dent J 2011; 31(1): 217-21.
14. D'Souza KM, Aras M. Association between socio-demographic variables and partial edentulism in the Goan population: An epidemiological study in India. Int J Dent Res 2014; 25(4): 434-38.
15. Prabhu N, Kumar S. Partial Edentulous-ness in a rural population based on Kennedy's classification: An Epidemiological study. J Indian Prosthodont Soc 2009; 9(1): 18-23.
16. Khalil A, Hussain U, Iqbal R, Ali W. Patterns of partial edentulism among patients reporting to department of prosthodontics, khyber college of dentistry, Peshawar. J Khyber Coll Dent 2013; 3(2): 42-45.
17. Charyeva OO, Altynbekov KD, Nysanova BZ. Kennedy classification and treatment options: A study of partially edentulous patients being treated in a specialised prosthetic clinic. J Prosthodont 2012; 21(3): 177-80.
18. Patel JY, Vohra MY, Hussain JM. Assessment of Partially edentulous patients based on Kennedy's classification and its relation with Gender Predilection. Int J Sci Study 2014; 2(6): 32-36.
19. Al-Moaleem MM, Somaili DM, Ageeli TA, Namis SM, Mobarki AH, Mohamed MS, et al. Pattern of partial edentulism and its relation to age, gender, causes of teeth loss in Jazan population. Am J Health Res 2016; 4(5): 121-26.
20. Al-Dwari ZN. Partial edentulism and removable denture construction: a frequency study in Jordanians. Eur J Prosthodont Restor Dent 2006; 14(1): 13-17.