A Cross Sectional Study for Assessment of the Pattern of Partial Edentulism in Various Municipalities of Kavre District

Basnyat SKC,[1] Prajapati D,[2] Mahanta S[3]

[1]Associate Professor, Department of Prosthodontics, Dhulikhel Hospital, Kathmandu University School of Medical Sciences, Nepal

[2,3]Assistant Professor, Department of Community and Public Health, Dhulikhel Hospital, Kathmandu University School of Medical Sciences, Nepal

ABSTRACT

Introduction: Partial edentulism refers to missing one or more natural teeth but not all. Classifying the partial edentulous arches is necessary as it helps in treatment planning, designing and recognition of prosthetic support for removable partial denture. The main aim of this study was to access patterns of partial edentulism among patients and determine its association with socio-demographic parameters.

Methods: Patients from various municipalities of Kavre district were selected for the study. Total of 206 patients were selected. The study was divided into two part. Questionnaire related to demographic data and intraoral examination to evaluate the pattern of partial edentulism according to Kennedy's Classification and Applegate's rule. The chi-square test was used to determine the association between Socio-demographic variables and pattern of partial edentulism. Statistical evaluation will be done using the Statistical Package for Social Sciences (SPSS 20.0), the level of significance set at p-value <0.05.

Result: The number of partially edentulous was less in the age group 20-30 years 38 (27.33%) and 45(28.48%) respectively, whereas, it was high in age group above 50 years 52 (37.41 %) and 57 (36.08 %) respectively. Kennedy's Class III was the most common type of partial edentulism in both maxillary arch 62 (48.82%) and mandibular arch 71 (46.71%) followed by Class I in both maxilla 31(24.41%) and 38(25%). The least common type of partial edentulism was found to be Class IV. Among the modifications Class III Modification I was the most prevalent condition in both maxillary 17 (27.42%) and mandibular arch 22 (30.9%).

Conclusion: The study showed that age had statistically significant association with different classes of partial edentulism in both maxillary and mandibular arches. Whereas, gender had no association with the patterns of partial edentulism.

Key words: Applegate's rule, Kennedy's classification, Partial edentulism.

INTRODUCTION

Partial edentulism is a condition characterized by the absence of one or more natural teeth but not all. The reason for loss of teeth may be dental caries, periodontal problems, trauma, congenital anomalies, neoplastic or cystic lesions.[1,2] The quality of life of an individual is markedly affected by oral health.[3] Poor oral health and loss of teeth result in reduced dietary intake and cause nutritional deficiency; which ultimately affects general health.[4]

Partial edentulism results in drifting and tilting of adjacent teeth, supra eruption of opposing teeth, altered speech, changes in facial appearance and tempero-mandibular disorders. [5,6] Loss of teeth restricts dietary options, leads to lack of confidence and confined social activities, which may adversely affect the quality of life and lead

Conflict of Interest: None

***Corresponding Author**

Dr. Smriti KC Basnyat,
Associate Professor,Department of Prosthodontics, Dhulikhel Hospital, Kathmandu University School of Medical Sciences, Nepal
E-mail: smritikc5@gmail.com

to psychological dissatisfaction.[2] Edentulism whether partial or complete indicates that the awareness regarding oral health of the study population.[7]

The variation in number and location of the edentulous space and its relation to the remaining natural teeth necessitates to classify the partial edentulous arches.[8] There are numbers of classification systems for classifying the partially edentulous arches.[9,10] Kennedy's classification is the most accepted system as it is easy to understand and use.[11] The aim of the study was to determine the patterns of partial edentulism as per Kennedy's classification in the patients visiting the Dhulikhel Hospital and various municipalities of Kavre district and its association with age and gender.

METHODS

A cross-sectional study was conducted among patients visiting the Dental Outpatient Department (DOPD) of Dhulikhel Hospital, Kathmandu University School of Medical Sciences, Kathmandu, Nepal and various municipalities of Kavre district (Pankhal and Namobuddha). The age of the participants ranged from 20 to 70 years. Ethical approval was obtained from Institutional Review Committee (IRC) of Kathmandu University School of Medical Sciences (KUSMS) (IRC-KUSMS Approval No 161/22). The duration of study was 3 months from November 2022 to January 2023.

The sample size was determined to be 206, which was calculated based on the study done in central Nepal[12] with a prevalence of 84% of edentulism, using formula, $N=Z^2p(1-p)/d^2$, where Z=static constant corresponding to level of confidence, p=expected prevalence and d= precision or margin of error, with 5% margin of error, 95% confidence interval and Z=1.96.

Patients with partial edentulism in either or both the jaws were included in the study. A dental assistant was trained to communicate with the patient and helping the investigator during examination and data collection. The study was based on intraoral examination to evaluate the pattern of partial edentulism according to Kennedy's Classification system with Applegate's modification.[8,13] Data was entered into Microsoft excel and further analyzed using SPSS 20. The chi-square test was used to determine the association between age and gender with pattern of edentulism.

RESULTS

Out of 206 patients, 99 (48.06%) were male and 107 (51.94%) were females. With regards to classification based on age, both maxillary and mandibular arch showed the lowest number of partial edentulism in age group 20-30 years 38 (27.33%) and 45(28.48%) respectively, whereas, highest edentulism was found in age group above 50 years 52 (37.41%) and 57 (36.08%) respectively. Kennedy's class III was the most common type of partial edentulism in both maxilla n=62(48.82%) and mandible n=71(46.71%) followed by class I in both maxilla n=31(24.41%) and mandible n=38(25%). The least common type of partial edentulism was found to be Class IV. Among the modifications Class III Modification I was the most prevalent in both maxillary 17(27.42%) and mandible 22(30.9%). (Table 1)

The result of this study showed that age had statistically significant association with different classes of partial edentulism in both maxillary and mandibular arches. But, gender did not reveal significant with the pattern of partial edentulism. (Table 2)

Table 1: Demographic parameters of patterns of partial edentulism in maxillary arch

Variables	Category	Kennedy Classificaiton in the maxillary arch n (%)				P value [a]
		Class I n (%)	Class II n (%)	Class III n (%)	Class IV n (%)	
Age in years	20-30	1 (2.63)	1 (2.63)	30 (78.95)	6 (15.79)	<0.001
	30-50	12 (24.49)	9 (18.37)	24 (48.98)	4 (8.16)	
	>50	16 (30.77)	14 (26.92)	21 (40.38)	1 (1.92)	
Gender	Male	16 (23.19)	16 (23.19)	32(46.38)	5 (7.25)	0.185
	Female	31 (41.89)	14 (18.92)	28 (37.84)	1 (1.35)	

Table 2: Demographic parameters of patterns of partial edentulism in mandibular arch

Variables	Category	Kennedy Classification in the mandibular arch n (%)				P value [a]
		Class I	Class II	Class III	Class IV	
Age in years	20-30	1(2.22)	1(2.22)	38(88.44)	5(11.11)	<0.001
	30-50	11(19.64)	10 (18.18)	30 (54.55)	4 (7.27)	
	>50	19 (33.33)	13(22.81)	24 (42.11)	1 (1.75)	
Gender	Male	15 (20.27)	13(17.57)	44 (59.46)	2(2.70)	0.263
	Female	26 (29.89)	17(19.54)	39 (44.83)	5 (5.75)	

Table 3: Distribution of partial edentulism in maxillary and mandibular arches according to Kennedy –Applegate Classification

Kennedy's classification	Category	Maxillary arch		Mandibular arch	
		No. of individuals n (%)	Total n (%)	No. of individuals n (%)	Total n (%)
Class I	Without modification	24 (77.42)	31(24.41)	27(71.05)	38(25)
	Modification 1	6(19.35)		8(21.05)	
	Modification 2	1(3.23)		3(7.89)	
Class II	Without modification	12(46.15)	26(20.47)	18(54.55)	33 (21.71)
	Modification 1	9(34.62)		11(33.33)	
	Modification 2	4(15.38)		3(9.09)	
	Modification 3	1(3.85)		1(3.03)	
Class III	Without modification	33(53.23)	62(48.82)	40(56.34)	71(46.71)
	Modification 1	17(27.42)		22(30.99)	
	Modification 2	10(16.13)		7(9.86)	
	Modification 3	2(3.23)		2(2.82)	
Class IV		8(100)		10(100)	

DISCUSSION

Retaining a greater number of teeth indicates good oral hygiene practice done by the patient. Studies have shown that loss of tooth is directly related to general health, overall quality of life and awareness of the patient.[14] This study was done to determine different patterns and frequency of partial edentulism according to Kennedy's classification and determine its association with age and gender. This study showed that Kennedy class III were more prevalent on both maxillary and mandibular

arches. This result of this study is in agreement with similar other studies .[15, 16] It was observed that partial edentulism was more common in the mandibular arch compared to the maxilla arch. This could be attributed to the fact that since the molar is the first tooth to erupt in the oral cavity, having a higher risk of caries and therefore have a higher chance of the tooth being extracted at the early age. Tooth loss was observed earlier in mandibular arch compared to maxillary because lower teeth erupt earlier in the oral cavity .[17] In contrast to our study, some studies concluded that partial edentulism Class I were more common. [17, 18] There is an increase in Class I and II edentulism and decrease in Class III partial edentulism with increasing age.

Most of the studies agree that class IV is the least common among pattern of partial edentulism.[16, 19] The studies have shown that Class I is the common in mandibular arch, while Class II is the most common in the maxillary arch.[20,21] The pattern of edentulism may be affected by various factors like age and gender. In this study, we found statistically significant association of age and pattern of partial edentulism. This is in concurrence with majority of past researches. A study indicated found co-relation chewing problems teeth mobility and missing teeth. So, prevention of disabilities should be aimed at both functional limitations and oral health problems to promote a healthy life in old age. [23] There is an increase in class I and II pattern of partial edentulism and decrease in class III with increase in age. With the advance in age there is increase in loss of teeth, extension of existing saddle can lead to increase in Class I and II edentulism. [1, 2, 6] This study revealed that edentulism was more common among females compared to male. This finding is in agreement with the previous study. [24,25] However, some studies point out that males outnumbered females in terms of partially edentulism.[26]

This study shows that gender is not statistically associated with partial edentulism. This is in line with other studies by [1, 6] in contrast to above, some studies have established statistically significant association between gender and pattern of partial edentulism .[22] These authors attributed it to the fact that males are more active than females and do not pay much attention to oral care.[27, 28]

The main limitation of the study is the small sample size which was because the study included patients only from 2 municipalities of Kavre district. Similar studies should be carried out in future covering larger population which will provide a more realistic picture of pattern of edentulism in Nepal.

CONCLUSION

The study concluded that Class III pattern of partial edentulism was most common, followed by Class I and Class II. The least common one was found to be Class IV. The pattern of partial edentulism was more common in mandibular arch than maxillary arch. The study revealed that the age of the patient has statistically significant association with pattern of partial edentulism. However, the association of gender with partial edentulism was statistically insignificant. It is necessary to create awareness among population to maintain good oral hygiene practices, which is essential to avoid tooth loss and decrease the prevalence of partial edentulism.

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