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Type of partial edentulousness among patients visiting the department of prosthodontics in a dental college

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Abstract

Background: There are various combinations of partial edentulism pattern in mandible and maxilla. Documenting the pattern of tooth loss is important for health care planning as it indicates the health of people and satisfaction of oral health care system.

Objectives: To find out different types of partial edentulism among patients who come to the Department of Prosthodontics for prosthesis.

Methods: A descriptive cross sectional study was carried out in 350 patients at Kathmandu Medical College and Teaching Hospital (KMCTH) visiting Department of Prosthodontics over the period of three months (July 2021 - September 2021) by convenience sampling method with complaint of partial edentulism. Ethical approval for the study was granted by Institutional Review Committee of KMCTH on 8th June 2021. The data obtained were entered and analysed using Statistical Package for Social Sciences (SPSS) v.18.

Results: Single most common reason for tooth loss was found to be dental caries (102,29.14 %). Multiple most common reason for tooth loss were dental caries and periodontal disease (117,33.43 %). Partial edentulism in maxillary arch only 112(32%), in mandibular arch only 172(49.14%) and in both arches 66(18.86%). Kennedy's Class III type of edentulism was most common in both maxillary arch 104 and mandibular arch 157.

Conclusion: Kennedy's Class III is most common type of partial edentulism in both maxillary and mandibular arch. Preventive programs targeted at reducing tooth loss need to be developed and implemented at national level since most prevalent cause of tooth loss is preventable.

Key words: Jaw; Edentulous; Partially.

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INTRODUCTION

Edentulism remains a serious public health issue across the world for its high prevalence and associated disability.[1,2] Prevalence of edentulism has declined in last decade in developed countries and this reflects improvement of oral health care system and public awareness program.[3-5]

Documenting the pattern of tooth loss is important,[6] for future health care planning as it indicates the health of people and satisfaction of the oral health care system.[7]

There are various methods for the classification of the partial edentulism[8] among which Kennedy's classification is most widely accepted classification.[9] Edward Kennedy's (1923) 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 presents in anterior to remaining natural teeth crossing the midline.[10]

The goal of this study is to find out how often different types of partial edentulism are among patients who come to the Department of Prosthodontics for prosthesis. This will assist in formulating plans in our region by recognizing the tooth loss pattern in various age groups of both genders.

METHODOLOGY

A descriptive cross-sectional study was carried out at Kathmandu Medical College from July 2021 to September 2021. Ethical approval for the study was granted by Institutional Review Committee of Kathmandu Medical Collegeon 8th June 2021 (Ref: 0106202104).

Sample size was calculated using formula $n = z^2 \times p \times q/e^2$, adding 5% non-response rate, z = 1.96 at 95% confidence interval, p = 24.9[11] and margin of error of 5%. Convenience sampling method was used. The inclusion criteria for the selection of participants were outpatients visiting Department of Prosthodontics for replacement of missing teeth and aged 15 years and above. Patients with completely edentulous maxillary or mandibular arch as well as those with missing one or more third molars were excluded from the study. After explaining the nature of the study, consent was taken in written form. In the case of minors (below 18 years of age), consent was taken from attending parents. Patients who met the inclusion criteria were examined by the principal investigator, and data was collected. The collected data was entered and statically analysed using SPSS Statistics for Windows, version 18.0 (SPSS Inc., Chicago, Ill., USA) and descriptive statistics were performed.

RESULTS

Of the total 350 participants more than half 190 (54.29%) were male and 160 (45.71%) were females.

Table 1: Reason for loss of teeth

Reasons	n (%)
Dental caries	102 (29.14)
Periodontal reasons	56 (16.00)
Trauma	14 (4.00)
Congenital missing	3 (0.86)
Dental caries and periodontal	117 (33.43)
Dental caries and trauma	26 (7.43)
Periodontal and trauma	20 (5.71)
Caries, periodontal and trauma	12 (3.43)

Table 2: Arch wise distribution of partial edentulism, n (%)

Maxillary Only	112 (32.00)
Mandibular Only	172 (49.14)
Both Maxillary and Mandibular	66 (18.86)

Table 3: Distribution of edentulism according to Kennedy's classification

Edentulism	Maxillary Arch	Mandibular Arch
Class I	22	18
Class II	38	45
Class III	104	157
Class IV	14	18

DISCUSSION

Edentulism is a permanent condition that occurs as an end result of periodontal diseases and dental caries and directly affects persons facial appearance, nutrition and ability to eat, speak, and socialise.[12] Dental caries is considered to be the main cause of edentulism in ages less than 45 years while periodontal disease is the primary cause of tooth loss in older ages.[13]

Among various factors recorded for the loss of teeth, we found dental caries to be the most common single factor, accounting for nearly 30% of all tooth loss. This finding corresponds to the study done by Bhandari et al..[11] The second most common single factor for tooth loss is due to periodontal reasons, which accounts for 16% of edentulousness in our study population, which contradicts the study conducted by Vadavadagi et al.[4] that concluded periodontal reasons to be the most common single factor.

In most of the cases of this study, there were combinations of factors responsible for the tooth/teeth loss. Among the above-mentioned factors, dental caries and periodontal problems are responsible for the highest number of tooth losses, 33.43%. If the proper oral health care facilities and oral health awareness were provided to the general public, tooth/teeth losses due to caries and periodontal problems could be significantly reduced.

With regards to the archwise distribution of edentulism, the mandibular arch is most commonly associated with tooth/tooth loss at 49.14%, while the maxillary arch results in 30% of cases. This may be related to the fact that mandibular teeth emerge earlier in the oral cavity, resulting in a higher caries rate and a greater probability

of the tooth being removed. This archwise distribution of edentulism is in accordance with the findings of Madhankumar et al.,[3] and Bhandari et al.,[11] while 18.80% of participants have edentulism present on both arches.

The most common form of edentulism in both maxillary and mandibular arches is Kennedy's Class III, and similar findings were found in studies done by Madhankumar et al.,[3] Vadavadagi et al.,[4] Shah et al.,[6] Gopal et al.,[9] Araby et al.,[14] and Bhandari et al.[11]

In our study, we found 104 Kennedy's Class III in the Maxillary arch and 157 Kennedy's Class III in the mandibular arch. The prevalence of Kennedy's class III in our study is more in the mandibular arch as stated by Shah et al.[6] but Madhankumar et al.,[3] Vadavadagi et al.,[4] and Bhandari et al.[11] found the opposite, i.e., more prevalent Kennedy's Class III in the Maxillary Arch. The Kennedy's Class III pattern of partial edentulism predominates in the current study group, which could be related to patients' willingness to extraction of carious and periodontally affected tooth rather than definitive treatment to preserve tooth. The other most common causes of Class III dominance are failure of root canal treatment, which encourages patients to extraction, and the first molar, which is the first permanent tooth to erupt into the oral cavity, with a higher caries rate and a higher probability of extraction[10].

The second most common edentulism in class II in both maxillary and mandibular arches with a value of 38 and 45, respectively, which is in agreement with studies conducted by Vadavadagi et al.,[4] Shah et al.,[6] Gopal et al.,[9] Araby et al.,[14] but in the study conducted by Madhankumar et al.[3] the second most common is Kennedy's Class IV in both arches. In our study, Kennedy's Class IV is the least common in the Maxillary arch with 14 people in the study population present with it, but in the Mandibular arch it corresponds with Kennedy's class I with a value of 18.

Future research in this field should focus on the socioeconomic status of the study group, the availability of oral health care services in their area, quality of life changes before and after tooth extraction and replacement, and patients' willingness to preserve their teeth.

CONCLUSION

Kennedy's Class III is the most common type of partial edentulism in both maxillary and mandibular arch. According to the findings of the study conducted at the institutional level, preventive programs targeted at reducing tooth loss need to be developed and implemented at the national level since the most prevalent cause of tooth loss is preventable.

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REFERENCES

1. Nordenram G, Davidson T, Gynther G, Helgesson G, Hultin M, Jemt T, Lekholm U, Nilner K, Norlund A, Rohlin M, Sunnegårdh-Grönberg K, Tranæus S. Qualitative studies of patients' perceptions of loss of teeth, the edentulous state and prosthetic rehabilitation: a systematic review with meta-synthesis. Acta Odontol Scand. 2013 May-Jul;71(3-4):937-51. [PubMed | Full Text | DOI]
2. Peltzer K, Hewlett S, Yawson AE, Moynihan P, Preet R, Wu F, Guo G, Arokiasamy P, Snodgrass JJ, Chatterji S, Engelstad ME, Kowal P. Prevalence of loss of all teeth (edentulism) and associated factors in older adults in China, Ghana, India, Mexico, Russia and South Africa. Int J Environ Res Public Health. 2014 Oct 30;11(11):11308-24. [PubMed | Full Text | DOI]
3. Madhankumar S, Mohamed K, Natarajan S, Kumar VA, Athiban I, Padmanabhan TV. Prevalence of partial edentulousness among the patients reporting to the Department of Prosthodontics Sri Ramachandra University Chennai, India: An epidemiological study. J Pharm Bioallied Sci. 2015 Aug;7(Suppl 2):S643-7. [PubMed | Full Text | DOI]
4. Vadavadagi SV, Srinivasa H, Goutham GB, Hajira N, Lahari M, Reddy GT. Partial Edentulism and its Association with Socio-Demographic Variables among Subjects Attending Dental Teaching Institutions, India. J Int Oral Health. 2015;7(Suppl 2):60-3. [PubMed | Full Text]
5. El-Meligy O, Maashi M, Al-Mushayt A, Al-Nowaiser A, Al-Mubark S. The Effect of Full-Mouth Rehabilitation on Oral Health-Related Quality of Life for Children with Special Health Care Needs. J Clin Pediatr Dent. 2016 Winter;40(1):53-61. [PubMed | Full Text | DOI]
6. Umar Shah M, Qamar K, Zakir A, Hammad Azeem S, Aqeel R, Syed S. The frequency and pattern of partial Edentulism in patients reporting to Prosthodontic Department: A Cross-sectional observational study. Vol. 13, Isra Med J. |. [Full Text]

7. Singh SK, Alvi HA, Ramashankar, Singh S V., Mishra N, Singh K, et al. Hospital-based pilot study on partially dentate and edentate patients to evaluate disparity between prosthodontic treatment demand and need: A cross-sectional sociodemographic study. Clin Epidemiol Glob Heal. 2016;4:S29–35. [Full Text | DOI]
8. Miller EL. Systems for classifying partially dentulous arches. J Prosthet Dent. 1970 Jul;24(1):25-40. [PubMed | Full Text | DOI]
9. Gopal TM, Subhashree R. Prevalence of kennedy classification in partially edentulous patients - A retrospective study. Indian J Forensic Med Toxicol. 2020;14(4):5585–91. [Full Text | DOI]
10. Carr AB, Brown DT. McCracken's removable partial prosthodontics,. 13th ed. St. Louis, Missouri: Elsevier; 2016. 16–20 p. [Full Text]
11. Bhandari A, Manandhar A, Manandhar P. Partial Edentulousness in Patients Visiting the Dental Out-Patient Department of Gandaki Medical College, Pokhara, Nepal. J Gandaki Med Coll. 2019;12(2):28–31. [Full Text]
12. Tyrovolas S, Koyanagi A, Panagiotakos DB, Haro JM, Kassebaum NJ, Chrepa V, Kotsakis GA. Population prevalence of edentulism and its association with depression and self-rated health. Sci Rep. 2016 Nov 17;6:37083. [PubMed | Full Text | DOI]
13. Papapanou PN. Periodontal diseases: epidemiology. Ann Periodontol. 1996 Nov;1(1):1-36. [PubMed | Full Text | DOI]
14. Yasser A. Araby, Abdurrahman S. Almutairy and Fawaz M. Alotaibi. Pattern of Partial Edentulism in Correlation to Age and Gender among a Selected Saudi Population. International Journal of Dental Sciences and Research. 2017; 5(1):1-4. [Full Text]