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Prevalence of Partial Edentulism and Its Relation to Age and Gender in Ahmedabad Population

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¹Dr.AribaAzmi, ²Dr. Ina Patel, ³Dr.KinjalSolanki, ⁴Dr.Shachi Patel, ⁵Dr.Bhupesh Patel, ⁶Dr.JavedAlam, ⁷Dr.AribaAzmi

[1]Institutional affiliations: PG student, AMC Dental College & Hospital

[2]Institutional affiliations: Head of the department, Prosthodontics and crown and bridge, AMC Dental College & Hospital.

[3]Institutional affiliations: Reader, Prosthodontics and crown and bridge, AMC Dental College & Hospital.

[4]Institutional affiliations: PG student, Prosthodontics and crown and bridge, AMC Dental College & Hospital.

[5]Institutinal affiliation: Head of the department, Oral Pathology and Oral Microbiology, Faculty of Dental Science, DDU.

[6]Institutinal affiliation: Associate Professor, School of Humanities and Social Science, NIMS University.

[7]B-201, Valeden plaza, Imran nagar, Vapi, Valsad, Gujarat.

Email: azmiaribamds@gmail.com.

ABSTRACT

Objective: The current study wasaimed to determine the prevalence and pattern of partial edentulism among dental patients attending AMC Dental College and Hospital, Ahmedabad. Materials and Methods: A total of 350 patients were selected, and the prevalence of partial edentulism among the selected patient was recorded. Patients were grouped according to three age groups; Group I: 21–30 years, Group II: 31–40 years, and Group III: 41–50 years. Kennedy's classification was used to determine the pattern of partially edentulous arches. Modification areas were not included in the assessment to avoid complexity. Data was analysed using the SPS version 20.0 software for windows. Results: The results showed that the occurrence of Kennedy Class III partial edentulism was 59.6% in the maxillary arch and 57.1% in the mandibular arch. Followed by Class II in both maxillary and mandibular arch with an average of 26.7 % in maxillary arch and30.5% in the mandibular arch. Based on these results, class III has the highest prevalence in group III (41– 50 years). Class I and class II have the highest incidence among group III Patients (41-50 years). Conclusions: Among selected patients, Class III dental arch was the most prevalent pattern in maxillary and mandibular arches. Class IV was being the least dominant pattern between all classes.

INTRODUCTION

Tooth loss is an edentulous space, which is presented as a gap in the dental arch due to missing tooth/teeth. A person may lack a few teeth or all the teeth which is known as partially edentulous or complete edentulous in one or both (upper and lower jaws) .[1] There are various reason for tooth loss like caries, periodontal problems, traumatic injuries, impactions, supernumerary teeth, neoplastic and cystic lesions. [2-5]

Possibilities of more than 65,000 combinations for pattern of partial edentulism in opposing arches exist. So it is logical to classify partial edentulism that share common attributes, charcteristics and qualities or traits. [8]A classification would help to understand and treat the problem. And it also would facilitate communication, discussion, comprehension of the suggested prosthetic treatment among dentists and technicians.[1]

An estimate of the percentage of partially edentulous persons is a tentative indication of the frequency of dental diseases and the success or failure of dental care. Observance of a pattern of tooth loss determines the treatment requirement among the population.[1]. Monitoring the occurrence of partial edentulism is important because it is an indicator of both population health and adequacy of a country's oral health care system. The absence of organized diagnostic criteria for partial edentulism has been a longstanding impediment.

METHOD

The study was conducted among patients attending Outpatient Department of prosthodontics at AMC Dental College and Hospital, Ahmedabadfrom March 2019 to Sep 2019. The sample included both genders, aged between 21 to 50 years with partial edentulism. Based on information from previous studies[3,6,7] 350 cases were enough for conducting the research at power 0.80, confidence interval of 0.95 and alpha level of 0.05.

Inclusion Criteria

1. The selection criteria required the subjects with age between 20 and 50 years with partial edentulous space.
2. Both male and female subjects were included.

Exclusion Criteria

1. Patients with only third molar missing were not included in the study.
2. Patients with root piece, mobile tooth that were indicated for extraction were not included in the study.
3. Patient with congenital missing teeth or unerupted teeth were not included in the study.
4. Patient's with prosthesis
5. Those who did not agree to participate.

Procedure

Prior to start of the study, the purpose was explained to the study subjects.

They were grouped into three age groups.

Group I: 21–30 years.

Group II: 31–40 years.

Group III: 41–50 years.

They were further divided into males and females and the study was carried out by single investigator. The prevalence of partial edentulism was determined by using Kennedys classification of partially edentulous archeswithout its modification for simplicity of the study.

Sample Patient Record :

Figure 1: Partial edentulism in maxillary arch

Figure 1: Partial edentulism in mandibular arch
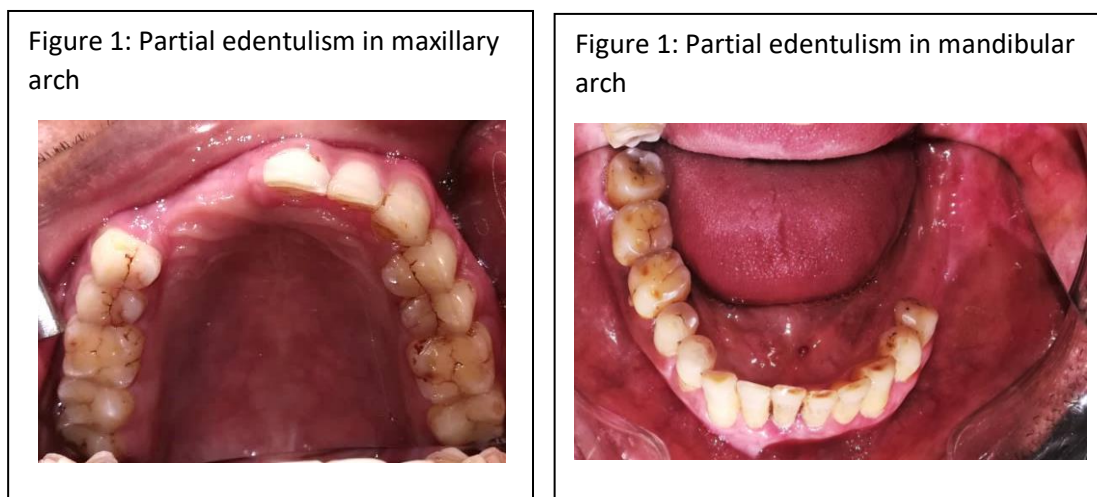
Statistical Analysis

The data thus obtained were entered at the end of the study in the master chart prepared in Microsoft Excel 2010 and used for scoring and inferential statistical data analysis using SPS version 20.0 software.Test of significance used was CHI SQUARE test, which was used for comparisons and correlation.

RESULTS

Table1: Distribution based on different Kennedy's classes among the male and female group

Kennedys class	Gender		Total
	Male	**Female**	
Class I	11 (5.8)	18 (8.3)	29 (7.2)
Class II	58 (30.7)	60 (27.8)	118 (29.1)
Class III	107 (56.6)	128 (59.3)	235 (57.8)
Class IV	13 (6.9)	10 (4.6)	23 (5.7)
Total	189	216	405
P Value	**0.528 NS**		

There were slightly more partially edentulous women than men. Highest number of partial edentulism was seen for female gender group which was in Class III and least number of partial edentulism was also seen in female gender group for class IV (Table 1). In males, highest number of partial edentulism was in class III and least was in class I.

Table2: Distribution based on Kennedy's classes among maxillary arch and mandibular arch.

Kennedys class	Arch		Total
	Maxillary arch	**Mandibular arch**	
Class I	7 (4.8)	22 (8.5)	29 (7.2)
Class II	39 (26.7)	79 (30.5)	118 (29.1)
ClassIII	87 (59.6)	148 (57.1)	235 (57.8)
ClassIV	13 (8.9)	10 (3.9)	23 (5.7)
Total	146	259	405

Patients having partial edentulism in one arch were 295(84.2%), while partial edentulism in both the arches were 55(15.7%). The maxillary arch had lesser edentulism comparing mandibular arch(Table 2). In both the arches maximum number of edentulism was seen in class III followed by class II (Table 2).

Table3: Distribution based on different Kennedy's classes among the male and female group (Maxillary Arch)

Kennedys class	Gender		Total
	Male	**Female**	
Class I	4 (4.9)	3 (4.7)	7 (4.8)
Class II	23 (28.1)	16 (25)	39 (26.7)
Class III	48 (58.5)	39 (60.9)	87 (59.6)
Class IV	7 (8.5)	6 (9.4)	13 (8.9)
Total	82	64	146
P Value	**0.979 NS**		

In the maxillary arch, Kennedy's class III was the most common pattern of partial edentulism i.e. 87(59.6%), followed by Kennedy's class II i.e. 39(26.7%). Least common type of pattern inmaxillary arch was class I i.e. 7 (4.8 %) and 6 (9.4 %)for male and female respectively (Table 3).

Table4: Distribution based on different Kennedy's classes among the male and female group (Mandibular Arch)

Kennedys class	Gender		Total
	Male	Female	
Class I	7 (6.5)	15 (9.9)	22 (8.5)
Class II	35 (32.7)	44 (28.9)	79 (30.5)
Class III	59 (55.1)	89 (58.9)	148 (57.1)
Class IV	6 (5.6)	4 (2.6)	10 (3.9)
Total	107	152	259
P Value	0.444 NS		

In the mandibular arch, Kennedy's class III was the most prevalent class i.e. 148(57.1%)followed by Kennedy's class II i.e.79(30.5%). Least common type of pattern for mandibular arch in males was Class Ii.e. 7 (6.5%) and in females was Class IV i.e. 4 (2.6%)(Table 4).

Table5: The age-wise distribution of the various Kennedy's classes. (Maxillary Arch)

Kennedys class	Age Group			Total
	Group 1 (21-30 years)	Group 11 (31-40 years)	Group 111 (41-50 years)	
Class I	0 (0)	0 (0)	7 (7.8)	7 (4.8)
Class II	2 (9.1)	7 (20.6)	30 (33.3)	39 (26.7)
Class III	18 (81.8)	24 (70.6)	45 (50)	87 (59.6)
Class IV	2 (9.1)	3 (8.8)	8 (8.9)	13 (8.9)
Total	22	34	90	146
P Value	0.047 S			

When categorized by age groups, incidence of Kennedy's Class III found in maxillary arch which was highestcompared to other classes in age group I (21-30 years). Highest number of patients with partial edentulism was seen in age group III (41-50 years) and nonewas seen in Group 1(21-30 years)(Table 5).

Table6: The age-wise distribution of the various Kennedy's classes. (Mandibular Arch)

Kennedys class	Age Group			Total
	Group 1 (21-30 years)	Group 11 (31-40 years)	Group 111 (41-50 years)	
Class I	1 (1.9)	5 (6.6)	16 (12.2)	22 (8.5)
Class II	7 (13.5)	25 (32.9)	47 (35.9)	79 (30.5)
Class III	44 (84.6)	42 (55.3)	62 (47.3)	148 (57.1)
Class IV	0 (0)	4 (5.3)	6 (4.6)	10 (3.9)
Total	52	76	131	259
P Value	0.001 S			

Incidence of Kennedy's Class III found in mandibular Arch which was highest than other classesin the group I (21-30 years). Highest patient with partial edentulism was seen in group III(41-50 years) with Class III pattern and nonefor Class IV pattern in Group I (21-30 years)(Table 6).

Table7: The age-wise distribution of the various Kennedy's classes.

Kennedys class	Age Group			Total
	Group 1 (21-30 years)	Group 11 (31-40 years)	Group 111 (41-50 years)	
Class I	1 (1.4)	5 (4.5)	23 (10.4)	29 (7.2)
Class II	9 (12.2)	32 (29.1)	77 (34.9)	118 (29.1)
Class III	62 (83.8)	66 (60)	107 (48.4)	235 (58.0)
Class IV	2 (2.7)	7 (6.4)	14 (6.3)	23 (5.7)
Total	74	110	221	405
P Value	0.011 S			

Most patients with partial edentulism belonged in the age range of 41-50 years(Table7). Among all age groups in both arches, Kennedy's class III followed by Kennedy's class II were the two most common patterns of partial edentulism.

DISCUSSION

Preventive strategies to decrease the burden of tooth loss are of great importance. It is highly suggested that population based studies to be conducted to investigate the epidemiology and risk factors of edentulism and tooth loss in India. [8,9]

In the current study, Kennedy classification was selected because it simplifies the description of partially edentulous cases, permits immediate visualization of the partially edentulous arch, provides a logical way to display the problems of design, and to simplify the application of basic principles of partial denture design. [10]

Some earlier studies by Suominen-Taipale et al [8] and Hoover et al[9] have also shown significant gender differences in edentulism with more males becoming edentulous than females.[8,9]On contrary to the above statement, this study showed that more number of missing teeth was seen in the female population which is similar to study done by Madhankumar et al [1] &Rana et al .[7]

The study done by Bharathi et al [10] shows that the frequency of maxillary edentulism was higher than mandibular edentulism among the study population .The results of the present study indicate that the frequency of mandibular edentulous was higher than maxillary edentulism among the study population which is similar to study done by Madhankumar et al [1] .

Kennedy's Class III was found to be the most common pattern of partial edentulism among all the age groups both in the maxillary arch and the mandibular arch. The present study was partially in accordance with Curtis et al.[38] wherein Kennedy's Class III was predominant only in the maxillary arches, while in mandibular arches the most prevalent pattern in the previous study was Kennedy's Class I. In contrast to our study, result of a study conducted by Khalil A et al. showed that Kennedy's class IV was mostly seen in maxillary arch and Kennedy's class II modification 1 was dominant in mandibular arch. [11]

Pun et al. investigated the patterns of tooth loss in patients receiving removable partial dentures (RPDs) and reported that Kennedy Class I was the most common RPD with a frequency of 38.4%.[12] A major disparity between the two studies is that of the age factor, as the age group of Curtis' [11] study was averaging 55 years whereas in this study the average age of the patients was 35.5 years. In the present study 41-50 years age group are mostly affected by partial edentulism which is in contrast to study done by Fayad et al [6] where 31-40 years group were more affected by partial edentulism.

The findings of the present study suggesting a predominance of Class III pattern of partial edentulism may be due to the fact that a higher frequency of younger age groups was encountered whereas higher frequency of older population was seen in previous studies

The data obtained from present study on the frequency and distribution of tooth loss are very important to provide the practitioners with the information needed to address various factors implicated in tooth loss, to reduce its mortality and also to educate and to motivate patients on the importance of saving tooth. At the national level, these data also suggest that preventive strategies aimed at reducing tooth loss need to be reinforced.

CONCLUSION

The present study showed that, among dental patients attending Dept. of Prosthodontic at AMC Dental College & Hospital, Ahmedabad , there is an increase in Class III case followed by class II casewith an increase in age. The prevalence of Class III was predominant among all the age groups. According to gender, more number of female patients reported with partial edentulism whereas patients with age 41 to 50 were mostly affected.

Comprehensive information on tooth loss is required to form a generalized database for the partial edentulism patterns, which will help us in the identification of the causes of such tooth loss and its prevention.The design of prosthodontic replacement depends upon the pattern of partial edentulism. It can be stated that the need for prosthodontics care is expected to increase with age, and hence, more efforts should be made for improving dental education and motivation among patients.

There are possible limitations in this study as the following factors were not evaluated. The cause of the tooth loss, the literacy level, and the socioeconomic status were not evaluated to identify the reason for tooth loss, chronology for tooth loss, and radiographs were not used to identify congenitally missing and impacted teeth.

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