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PREVALENCE OF PARTIAL EDENTULOUSNESS AMONG THE BANGLADESHI ADULTS

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Abstract

Background: The study was done to determine the occurrence of various missing teeth pattern among the partial edentulous patients residing in Chattogram district of Bangladesh. Study was undertaken from January to August 2018.

Materials and methods: The design was a descriptive cross-sectional study. Two hundred and thirty three persons aged between 13 and 87 years (106 males and 127 females) were included, intraoral examination was done visually and results were recorded on specially designed clinical examination forms. Data were analyzed using statistical package SPSS 19.0 version to investigate the relationship between quantitative variables.

Results: The results showed the patients with Kennedy's Class III were found to be the most prevalent among all the groups (38.67%). The most common modification in all the groups was Class III modification I (14.5%).

Conclusion: The findings of this study show that the Kennedy's Class III was the most commonly occurring and were found to be more predominant in the younger group of population.

Key words

Kennedy's classification; Missing tooth; Partial edentulousness.

Introduction

Tooth loss has an impact on an individual's oral health-related quality of life at biologic, psychological and social levels. The prevalence and extent of tooth loss have decreased significantly in many countries during recent decades[1,2,3]. There still remains a significant variation in tooth loss distribution[4]. These disparities may be attributed partly to the increased availability and accessibility to oral diseases prevention and control programs, as well as to increase in the awareness of the importance in oral health. The study of trends in tooth loss, comparing rate of occurrence between different populations, may provide important information about risk factors for tooth loss, potential changes in oral health status, and possible causes of these changes.

Tooth loss is identified by an edentulous space, which is a gap in the dental arch normally occupied by one tooth or more. It could be partial or complete. A person may lack a few teeth (Partially edentulous) or all the teeth in one or both upper and lower jaws (Completely edentulous) for various reasons. Bruce observed that the major reason for tooth loss across all the ages were due to dental caries (83%) followed by periodontal disease (17%)[5]. A simple estimate of the percentage of partially edentulous persons is a rough 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. The design of the prosthesis depends on the type of saddle area. A classification of partially edentulous arches helps to identify the relation of remaining teeth to edentulous ridges and facilitates communication, discussion, and comprehension of the suggested prosthetic treatment among dentists, students, and technicians.

Pattern of tooth loss is a clear indicator of levels of oral hygiene, dental health awareness, the magnitude of dental problems, and the management. Epidemiological studies related to the status of a pattern of tooth loss are scarce in Bangladesh. Owing to the large population, a nationwide survey cannot be done. However, the epidemiological features of partial edentulousness of one community

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can be assessed on the basis of a cross-sectional study. The present study was done in order to provide complete reflection of dental status and treatment needs which would be of valuable information to the National Oral Health Planners for laying out strategies to develop dental health care management in the country. Learning the truth that tooth loss and its effects are so detrimental, our study aimed to find:

- The incidence of Kennedy's classification among the partially edentulous subjects based on gender ratio and age-wise distributions
- Predominance of which type of Kennedy's classification among the patients attending the selected dental clinics in Chattogram for replacement of their missing teeth.

Materials and methods

This descriptive cross sectional study was carried out from January to August 2018 among patients reported to a Private Clinic for dental management situated at Chattogram, Bangladesh. Consecutive sampling technique was utilized for data collection and 233 patients were selected. The inclusion criteria involved both the genders, aged between 13 years and 87 years having partially edentulous areas in either or both the jaws. Completely edentulous patient and those with only missing maxillary and mandibular third molars were excluded from the study. The study population was divided into two clusters, comprised of 106 men and 127 women. The selected patients were grouped according to their age (Table I). Pretested proforma was used, which includes name, age, gender and details of missing permanent teeth.

Clinical examination of each patient was carried out after obtaining a verbal consent, and intraoral examination was done using a mouth mirror, probe in satisfactory lighting, and direct visual examination. No diagnostic aids like study models or radiographs were used in this survey. The patterns of missing teeth were identified according to the Kennedy's classification. The number of teeth was defined as healthy, carious or treated teeth (Including crowned, inlay and abutment teeth for fixed partial prosthesis) inclusive of completely erupted third molars. Un-erupted or congenitally missing teeth were excluded from the study. Data analysis was carried out by using IBM SPSS 19.0 version, to estimate the percentage of predominately occurring Kennedy's classification within the genders and also according to the age.

Results:

Table I: Grouping of selected subjects.

Age	Group
13-20	A
21-30	B
31-40	C
41-50	D
51-60	E
61-70	F
71+	G

Table II: Partial edentulous male subjects classified according to Kennedy's classification for the maxillary arch and the mandibular arch

Kennedy's class	Maxillary arch (%)	Mandibular arch (%)	Total (%)
Class I	07 (9.59)	03 (4.55)	10 (7.19)
Class-II	11 (15.07)	10 (15.15)	21 (15.11)
Class III	31 (42.47)	25 (37.88)	56 (40.29)
Class IV	01 (1.37)	03 (4.55)	04 (2.88)
Class I modification I	01 (1.37)	Nil	01 (0.72)
Class II modification I	07 (9.59)	11 (16.67)	18 (12.95)
Class III modification I	10 (13.70)	07 (10.61)	17 (12.23)
Class IV modification I	Nil	Nil	
Class I modification II	01 (1.37)	Nil	01 (0.72)
Class II modification II	02 (2.74)	02 (3.03)	04 (2.88)
Class III modification II	02 (2.74)	04 (6.06)	06 (4.32)
Class IV modification II	Nil	Nil	
Class I modification III	Nil	Nil	
Class II modification III	Nil	Nil	
Class III modification III	Nil	01 (1.52)	01 (0.72)
Class IV modification III	Nil	Nil	
Total	73	66	139

Total number is 139 (More than 106) as some subject had both maxillary and mandibular teeth missing.

Table III: Partial edentulous female subjects classified according to Kennedy's classification for the maxillary arch and the mandibular arch.

Kennedy's class	Maxillary arch (%)	Mandibular arch (%)	Total (%)
Class I	05 (5.49)	11 (10.89)	16 (8.33)
Class-II	11 (12.09)	10 (9.90)	21(10.94)
Class III	37 (40.66)	35 (34.65)	72 (37.50)

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Class IV	Nil	06 (5.94)	06 (3.13)
Class I modification I	03 (3.30)	04 (3.96)	07 (3.65)
Class II modification I	11 (12.09)	12 (11.88)	23 (11.98)
Class III modification I	12 (13.19)	19 (18.81)	31 (16.15)
Class IV modification I	Nil	Nil	Nil
Class I modification II	02 (2.20)	01 (0.99)	03 (1.56)
Class II modification II	05 (5.50)	Nil	05 (2.60)
Class III modification II	04 (4.40)	03 (2.97)	07 (3.65)
Class IV modification II	Nil	Nil	Nil
Class I modification III	Nil	Nil	Nil
Class II modification III	01 (1.10)	Nil	01 (0.52)
Class III modification III	Nil	Nil	Nil
Class IV modification III	Nil	Nil	Nil
Total	91	101	192

Total number is 192 (More than 127) as some subject had both maxillary and mandibular teeth missing.

Table IV : Age group-Kennedy type Cross tab.

			Kennedy type											Total
			K1	K1m1	K1m2	K2	K2m1	K2m2	K2m3	K3	K3m1	K3m2	K3m3	K4	
Age group	A	Count	1	0	0	1	0	0	0	11	0	0	0	0	13
		% within Age group	7.7%	.0%	.0%	7.7%	.0%	.0%	.0%	84.6%	.0%	.0%	.0%	.0%	100.0%
	B	Count	1	1	0	6	3	0	0	28	6	3	0	1	49
		% within Age group	2.0%	2.0%	.0%	12.2%	6.1%	.0%	.0%	57.0%	12.2%	6.1%	.0%	2.0%	100.0%
	C	Count	2	2	1	8	8	21	01	29	13	2	0	2	69
		% within Age group	2.9%	2.9%	1.4.%	11.6%	11.6%	2.9%	.0%	42.0%	18.8%	2.9%	.0%	2.9%	100.0%
	D	Count	7	2	1	12	15	3	1	30	15	0	1	3	90
		% within Age group	7.8%	2.2%	1.1%	13.3%	16.7%	3.3%	1.1%	33.3%	16.6%	0.0%	1.1%	3.3%	100.0%
	E	Count	6	2	0	5	5	1	0	16	10	3	0	2	50
		% within Age group	12.0%	4.0%	.0%	10.0%	10.0%	2.0%	.0%	32.0%	20.0%	6.0%	.0%	4.0%	100.0%
	F	Count	5	2	21	8	6	2	0	11	2	3	0	1	42
		% within Age group	11.9%	4.8%	4.8%	19.0%	14.3%	4.8%	.0%	26.2%	4.8%	7.1%	.0%	2.4%	100.0%
	G	Count	4	0	0	2	4	1	0	3	2	2	0	0	18
		% within Age group	22.2%	.0%	.0%	11.1%	22.2%	5.6%	.0%	16.7%	11.1%	11.1%	.0%	.0%	100.0%
Total		Count	26	9	41	42	41	9	1	128	48	13	1	9	331
		% within Age group	7.9%	2.7%	1.2%	12.7%	12.4%	2.7%	0.3%	38.7%	14.5%	3.9%	.3%	2.7%	100.0%

K-Kennedy, M-Modification.

Table V: Chi-Square Tests.

	Value	df	Asymp. Sig.(2 sided)
Pearson Chi-Square	69.890	66	.348
Likelihood Ratio	77.665	66	.154
N of Valid Cases	331		

Data were analyzed by using IBM SPSS 19.0 version, the Pearson Chi-square analysis test was conducted and $p < 0.05$ was considered to be statistically significant. The survey included 233 patients, of 106 (45.5%) male patients and 127 (54.5%) female patients aged between 13 and 87 years having partially edentulous areas in either or both the jaws. Table II and Table III show the incidence of different patterns of partial edentulism according to Kennedy's classification for male and female, respectively. The results showed the occurrence of Class III partial edentulism with 42.47% in maxillary and 37.88% in mandibular arch for a male patient. Similarly, Class III type of partial edentulism was also found in a female patient with 40.66% in maxillary and 33.66% in the mandibular arch.

This was followed by Class II modification I with average of 12.95% in male patients and class III modification I with an average of 16.15% in female patients.

Based on these results, patients with Kennedy's Class III were found to be the most prevalent among both the genders (41.46%) in the maxillary arch and (35.33%) in the mandibular arch, and the most common modification was Class III modification I in maxilla among both the genders (13.41%) and mandible for female 18.81%. For mandible of male, it was class II modification I (16.67%) the most prevalent one.

Table III show Kennedy classification for age-wise variation for maxillary and mandibular arch. The result showed Class III predominance between 13 and 70 years in both arches while Class I was found in the maxillary arch of age group 71–87 years.

Among the different age group, the predominance of Class III was found in 13–20 years. In this regard Chi-squared test was conducted to analyze whether there is any correlation when compared between the genders and also the age with respect to Kennedy's classifications in maxillary and the mandibular arch, and it was found that there was no association ($p>0.05$) when compared between the male and female patients for maxillary arch and mandibular arch.

Discussion

It is increasingly recognized that the impact of the disease on quality of life should be taken into account when assessing health status. It is likely that tooth loss, in most cases being a consequence of oral diseases, which affects the Oral Health-Related Quality of Life (OHRQoL)[6]. In a large Japanese study, Ide et al. found a strong correlation between the number of missing teeth and higher oral health impact profile scores suggesting impairment of OHRQoL[7]. Edentulous falls into a special category among the various disease of dental origin. Tooth loss is the dental equivalent to mortality. A simple estimation of the proportion of the partial edentulous case is a rough indication of the prevalence of dental diseases and the success or failure of dental care[8].

The prevalence of the partial edentulous adults in Iasi was 66.5% and was estimated that the rate of tooth loss was higher in the rural area, and more number of missing teeth were found in the male population[9]. In contrary to the above statement, this study showed that the prevalence of the partial edentulous adults is 55% in relation to total participants (233) and more number of missing teeth was seen in the female population (58%) than male (42%).

The results of the present study indicate that the frequency of mandibular edentulous was higher than maxillary edentulism among the study population. 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 except in 70–87 years in which Class II was predominant in maxillary arch. The present study was partially in accordance with Curtis et al where in 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[10]. A major disparity between the two studies is that of the age factor, as the age group of Curtis' study was averaging 55 years whereas in this study the average age of the patients was 43.55 years.

Al-Dwairi in a study investigated the frequency of different patterns of partial edentulism of 200 patients in Jordan and found that 150 had both maxillary and mandibular partial edentulism[11]. In the present study, Kennedy class III pattern of edentulism was the most commonly encountered in both the maxilla and mandible arches and Kennedy Class III modification I was the next most found from the result. This study also correlates with the study carried out on a Saudi population conducted by Sadig and Idowa examining 422 partially dentate arches, Kennedy's Class III was the most commonly encountered pattern of partial edentulism in both the upper and lower arches and Kennedy's Class IV was the least common pattern encountered[4].

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 present study also shows increased awareness among the younger population with large number of younger groups reporting to the prosthodontics sservice provider for replacing the missing tooth. The higher frequency of partial edentulism in these younger age group patients, as depicted by the results, might pertain to their low socioeconomic status; poor oral hygiene and less conservative treatment approach, relating to lack of time, leading to early tooth loss.

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. Peterson and Yamamoto reported that oral diseases and chronic diseases share common risk factors[12]. Hence, the National Health Programs should incorporate disease prevention and health promotion measures using a common risk factor approach in combination with the strategies to prevent tooth loss which need an urgent attention by the policy makers for old people.

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Limitations

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.

Conclusion

The present study reported the prevalence of missing tooth in different age group and gender which showed existence of Class III followed by Class III modification I among both jaws of both sexes except mandible of male sex where class II modification I is predominant.

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.

Recommendations

Further research and investigations with large samples are required to find out the more accurate results.

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Contribution of authors

MKU -Conception, acquisition of data, critical revision and final approval.

MAK- Design, analysis, critical revision and final approval

RD- Interpretation of data, drafting, critical revision and final approval.

MRM- Design, drafting and final approval

SA- Design, analysis, critical revision and final approval

Disclosure

All the authors declared no competing interest.

References

1. Okosioe FE. Tooth mortality: A clinical study of the causes of tooth loss. Niger Med J. 1977;7:77–81.

2. Odusanya SA. Tooth loss among Nigerians: Causes and pattern of mortality. Int J Oral Maxillofac Surg. 1987;16:184–9. [PubMed].

3. Kaimenyi JT, Sachdera P, Patel S. Causes of tooth mortality at the dental hospital unit of Kenyatta National Hospital, Kenya. J Odontostomatol Trop. 1998;1:17–20. [PubMed].

4. Sadig WM, Idowu AT. Removable partial denture design: A study of a selected population in Saudi Arabia. J Contemp Dent Pract. 2002;3: 40–53. [PubMed].

5. Bruce I, Nyako EA, Adobo J. Dental service utilisation at the Korle Bu Teaching Hospital. Afr Oral Health Sci J. 2001;3:64–67.

6. Gerritsen AE, Allen PF, Witter DJ, Bronkhorst EM, Creugers NH. Tooth loss and oral health-related quality of life: A systematic review and meta-analysis. Health Qual Life Outcomes. 2010;8:126. [PMC free article] [PubMed].

7. Ide R, Yamamoto R, Mizoue T. The Japanese version of the Oral Health Impact Profile (OHIP) -Validation among young and middle-aged adults. Community Dent Health. 2006;23:158–163. [PubMed]

8. Prabhu N, Kumar S, D'souza M, Hegde V. Partial edentulous in a rural population based on Kennedy's classification: An epidemiological study. J Indian Prosthodont Soc. 2009;9:18–23.

9. Murariu A, Hanganu CS, Danila I. Prevalence of missing teeth and the treatment need in adult population from Iasi, Romania. Int poster J Dent Oral Med. 2010;12 Poster 490.

10. Curtis DA, Curtis TA, Wagnild GW, Finzen FC. Incidence of various classes of removable partial dentures. J Prosthet Dent. 1992;67:664-667. [PubMed]

11. AL-Dwairi ZN. Partial edentulism and removable denture construction: A frequency study in Jordanians. Eur J Prosthodont Restor Dent. 2006;14:13–17. [PubMed].

12. Petersen PE, Yamamoto T. Improving the oral health of older people: The approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol. 2005;33:81–92. [PubMed].