Prevalence of Partial Edentulousness in a Population Based On Age and Gender: An Epidemiological Study.

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ABSTRACT

Background: To find out the prevalence of partial edentulousness in a given age group among the population attending the Non communicable disease opd in Tirunelveli Medical College and Hospital from September 2018 to February 2019. To evaluate the gender ratio among the partially edentulous patients. **Methods:** A total of 623 patients were randomly selected from the Non communicable disease opd attending the Tirunelveli medical college and hospital. The patients were divided into 6 groups based on age group 20-30, 31-40, 41-50, 51-60, 61-70, 71-80. They were divided into two groups based on gender as male and female. The partial edentulous condition was divided into 2 groups whether it is in maxilla or mandible. The type of partial edentulousness based on Kennedy's Classification was tabulated in customized clinical forms. **Results:** Class III Kennedy's edentulous condition was the most prevalent (33.1%) followed by class I edentulousness (16.2%). The age group of 51-60 (36%) had the maximum number of partially edentulous patients. There was no gender based distribution of partial edentulousness based on Kennedy's Classification. There was equal distribution of partial edentulousness in the maxilla and mandible. **Conclusion:** As prevention is better than cure, the importance of dental health care awareness becomes evident. The possible mode of treatment modality for the particular stage of partial edentulousness must be explained to the patient.

Keywords: Gender, Kennedy's Classification, Missing Teeth, Partial Edentulousness.

INTRODUCTION

Even a single tooth has its importance in every stage of life. In a country like India with varied cultures, traditions and beliefs the availability of resources for dental treatment, oral health care becomes a challenge.[1] Aging may not be a definite cause of tooth loss but it does increase the risk of systemic diseases and functional diseases.[2]

Edentulousness whether partial or complete affects the oral health related quality of life of a person as it affects his speech, mastication and appearance, nutrition and creates social and psychological problems. Missing anterior teeth marks the start of the second childhood. There are a lot of combinations of edentulousness which may be possible. So, to make it very simple Kennedy's Classification modified by Applegate is used to communicate between dentists, dental technicians and students.[3]

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MATERIALS & METHODS

Clinical examination with mouth mirror and dental probe was done under good illumination.

Inclusion Criteria:
1. Individuals with age group from 20 to 80 yrs.
2. Only permanent dentition was evaluated

Exclusion Criteria:
Unerupted or congenitally missing teeth, very loose teeth, root stumps.

The patients were divided into 6 groups based on age group 20-30, 31-40, 41-50, 51-60, 61-70, 71-80. They were divided into two groups based on gender as male and female. The partial edentulous condition was divided into 2 groups whether it is in maxilla or mandible.

Six hundred and twenty three patients were examined intraorally and the results regarding the type of partial edentulousness based on Kennedy's Classification were tabulated in customized clinical forms which contains data of the patient's age, gender, the type of Kennedy's Classification up to two modification spaces.

RESULTS

[Table 1 & 2] The prevalence of Kennedy's class I edentulousness was found to be maximum in the age group of 61-70 (36.6%) followed by 51-60 (27.7%) and then 41-50 (24.8%). There was no class I edentulousness in the age group of 20-30.

The prevalence of Kennedy's class II edentulousness was found to be maximum in the age group of 51-60 (41.8%) followed by 41-50 (27.8%) and then 61-70 (24.1%). There was no class II edentulousness in the age group of 20-30.

The prevalence of Kennedy's class III edentulousness was found to be maximum in the age group of 41-50 (33.0%) followed by 51-60 (29.6%) and then 61-70 (18.4%). All the patients in the age group of 20-30 belonged to Kennedy's class III group.

The maximum numbers of subjects with the Kennedy's class IV edentulousness were in the 51-60 age group followed by its equal distribution in the age group of 41-50 and 61-70.

Class I modification I was maximum seen in the age group of 61-70. Class II modification I was mostly seen in the age group of 61-70. Class III modification I was maximum seen in the age group of 61-70. Modification spaces of 2 in all the Kennedy's Classification were less prevalent.

- [Figure 1]: The prevalence of partial edentulousness was maximum in the 51-60 (36%) age group followed by equal distribution in the 41-50 and 61-70 (25.7%) age group.
- [Figure 2]: The prevalence of partial edentulousness was maximum class III Kennedy's Classification (33.1%) followed by class I (16.2%).

[Table 3] and Fig 3:The prevalence of partial edentulousness was more in females (61%) when compared to males (39%) but the prevalence of Kennedy's Classification of partial edentulousness had no correlation with gender . The p value was insignificant (0.520).

[Table 4 & 5]: The distribution of partial edentulousness as per Kennedy's Classification had no predisposition as per the maxillary or mandibular arch in relation to gender or age group. There was an almost equal distribution. The p value was insignificant.

Table 1: Correlation of Prevalence percentageof Partial Edentulousness According to Age Group

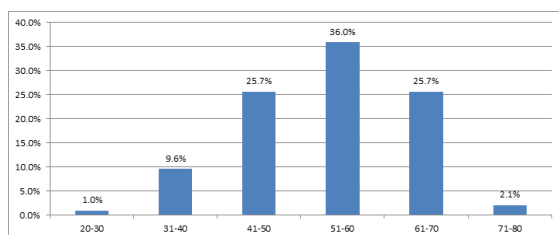| Age Group	Kennedy's Classification										Total
	C1	C2	C3	C4	C1M1	C2M1	C3M1	C1M2	C2M2	C3M2	
Count	0	0	6	0	0	0	0	0	0	0	6
20-30	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%
Count	7	4	31	6	0	4	7	1	0	0	60
31-40	6.9%	5.1%	15.0%	8.5%	0.0%	11.1%	8.1%	50.0%	0.0%	0.0%	9.6%
Count	25	22	68	16	4	6	16	0	1	2	160
41-50	24.8%	27.8%	33.0%	22.5%	13.8%	16.7%	18.6%	0.0%	11.1%	50.0%	25.7%
Count	28	33	61	30	9	18	41	1	2	1	224
51-60	27.7%	41.8%	29.6%	42.3%	31.0%	50.0%	47.7%	50.0%	22.2%	25.0%	36.0%
Count	37	19	38	16	15	8	20	0	6	1	160
61-70	36.6%	24.1%	18.4%	22.5%	51.7%	22.2%	23.3%	0.0%	66.7%	25.0%	25.7%
Count	4	1	2	3	1	0	2	0	0	0	13
71-80	4.0%	1.3%	1.0%	4.2%	3.4%	0.0%	2.3%	0.0%	0.0%	0.0%	2.1%
Count	101	79	206	71	29	36	86	2	9	4	623
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

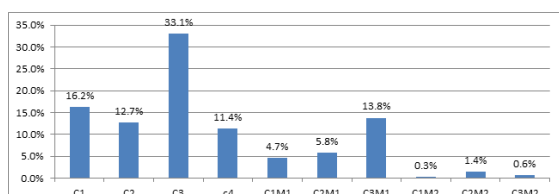**Figure 1: Prevalence of Partial Edentulousness Based on Age Group**

Figure 2: Prevalence of The Kennedy's Classification of Partial Edentulousness
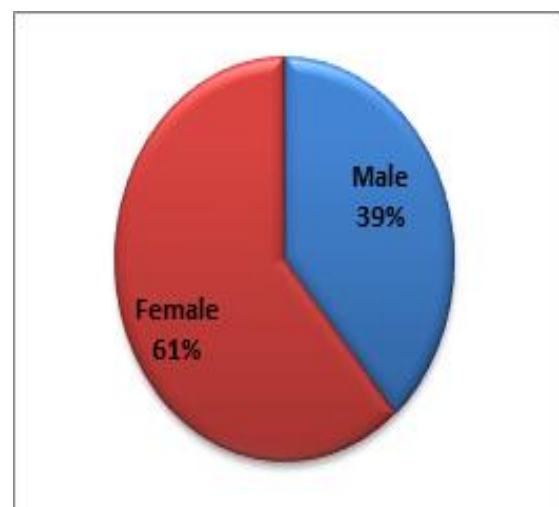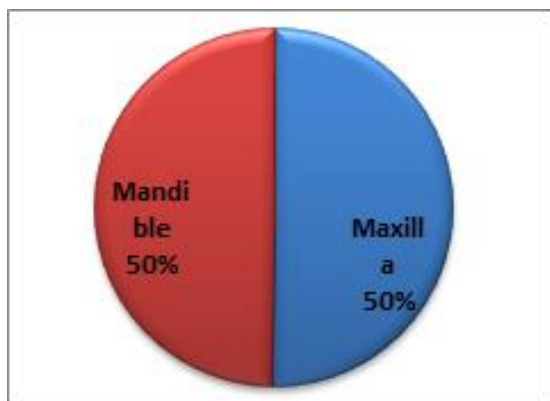

Figure 3: General Distribution of Partial Edentulousness Based on Gender

Table 3: Correlation of Kennedy's Classification with Gender

		Kennedy's Classification										P value
		C1	C2	C3	C4	C1M1	C2M1	C3M1	C1M2	C2M2	C3M2	
Gender	Male	45	25	74	29	13	12	34	1	6	2	0.520
	Female	56	54	132	42	16	24	52	1	3	2	
Total		101	79	206	71	29	36	86	2	9	4	

Figure 4: Prevalence of Partial Edentulousness between Maxillary and Mandibular Arch

Table 4: Correlation of Gender with its Distribution in Maxilla and Mandible

		Arch		P value
		Maxilla	Mandible	
gender	Male	124	117	0.631
	Female	189	193	
Total		313	310	

Table 5: Correlation of Age Group with its Distribution in Maxilla and Mandible

		Arch		P value
		Maxilla	Mandible	
Age Group	20-30	4	2	0.820
	31-40	34	26	
	41-50	82	78	
	51-60	108	116	
	61-70	79	81	
	71-80	6	7	
Total		313	310	

DISCUSSION

There are many factors which influence edentulism like occupation, education, socioeconomic status, lifestyle and their attitude towards dental care.[3] The most commonly found reasons for tooth loss were caries, periodontal diseases, trauma and others.[3] Kennedy's Classification enables visualization of the partially edentulous arch and a logical approach to the problems in design. Kennedy's Classification has a diverse acceptance and shows a clear demarcation between tooth supported and tissue supported denture and in this study also, Kennedy's Classification modified by Applegate was followed.[3]

According to Nirupama et al educational status is a major impact factor to create an overall awareness of one oral health needs and treatment needs. There is a need to educate not only the youngsters but also the elderly and the less privileged. These type of studies would be instrumental for the oral health planners to lay strategies for oral health care.[4]

According to the study by Madhankumar.S et al, class III (55%) followed by class III modification I was common among the age group of 31-40 while class II mod I was common among 71-80 yrs but in our study Kennedy's Class III edentulous condition was the most prevalent followed by class I edentulousness and the age group of 51-60 had the maximum number of partially edentulous patients.[5]

Study by Andreia Montandon et al supports the fact that caries and periodontal diseases were the common causes of tooth loss.[6] A highly unmet need on prosthetic care existed among the suburbs of south Chennai population due to lack of patient education and motivation and cost is another limiting factor according to Sanjna Nayar et al.[7]

According to Hakan Avsever et al radiographic examination is essential in partially or completely edentulous patients, however it was difficult in the Turkish population.[2] It was not feasible in our study. The study by Nayana Prabhu et al concludes that class III is most common in age group of 35-44. Mandibular edentulism is more common than maxillary edentulism and there is no gender correlation to partial edentulism but our study supports the prevalence of class III Kennedy's Classification in the age group of 31-40 and there is no predilection for maxillary or mandibular arch.[1]

As age increases it was found there is a transition of bounded saddles to free end saddles. The prevalence of partial edentulousness was maximum class III Kennedy's Classification (33.1%) followed by class I (16.2%).[8] Our study also supports this fact.

The number of partially edentulous females (76.4%) outnumbered the males (72.1%). Females had a lower level of employment and education which could be a probable reason for this disparity.[1] In our study females constituted 61% of the partially edentulous population.

Partial edentulousness is reduced in higher income groups and higher education status.[1]

According to George B et al preventive measures like topical fluoride application and use of fissure sealants should be undertaken for children through school dental health education programmes. According to this study maximum tooth loss was observed in subjects of age group 65-74 and females had a tooth loss of 47.9% when compared to males of 42.9% but in our study the age group of 51-60 had the maximum prevalence of 36% and females constituted 61% of the partially edentulous population9. The study by Dr.TruptiM.Dahane et al puts it forward that with increase in age there are

more of Class I and II Kennedy's Classification and a decrease in Class III and IV in both arches. The results put forward that gender has no significant correlation with this prevalence but socioeconomic factors, systemic diseases does influence this factor.[10] These results are synchronous with our study.

The study on the Najranian subpopulation reveals the fact that Kennedy's class II was the most prevalent in the maxillary arch while class I was most prevalent in the Mandibular arch whereas in our study there is no such predilection with reference to the maxillary or mandibular arch.[11]

The study by Hoshang Khalid Abdel-Rahman et al reveals that Kennedy's III Classification was the most dominant pattern with the frequency of 49.84% and mandibular RPD's were more frequent than maxillary RPD's. This fact does not support our study.[12]

According to the study by Manal Shubita class III Kennedy's Classification was more common in both the arches and partial edentulism was more common in mandibular arch . In this study also Kennedy's class III condition was more common but there was no predilection towards maxillary or mandibular arch.[13]

The study by JodatAskari et al puts forth that there was no gender correlation with partial edentulism and Kennedy's class III edentulism was more prevalent in 31-40 years followed by class II. Our study supports the prevalence of class III Kennedy's prevalence and there was no gender correlation.[14]

According to ZiaullahChaudhary et al Kennedy's class III edentulous condition was more in the age group of 46-75 yrs and the partial edentulism was more common in males. Our study does not support any gender correlation.[15]

CONCLUSION

The prevalence of partial edentulousness was maximum in the 51-60 (36%) age group followed by equal distribution in the 41-50 and 61-70 (25.7%) age group .Class III Kennedy's edentulous condition was the most prevalent (33.1%) followed by class I edentulousness(16.2%). The age group of 51-60 had the maximum number of partially edentulous patients. There was no gender based distribution of partial edentulousness based on Kennedy's Classification. There was equal distribution of partial edentulousness in the maxilla and mandible.

Limitations:

The socioeconomic status, chronology of tooth loss, reasons for the tooth loss was not evaluated and radiographs were not taken to find out the congenitally missing and impacted teeth.

REFERENCES

1. Prabhu N, Kumar S, D'souza M, Hedge V. Partial edentulous in a rural population based on Kennedy's Classification: An epidemiological study. J Indian ProsthodontSoc 2009; 9:18-23.

2. HakanAvsever, KaanGunduz, KaanOrhan, GodzeCanitezer, BulentPiskin, MesutAkyol .Prevalence of edentulousness, prosthetic need and panoramic radiographic findings of totally and partially edentulous patients in a sample of Turkish population: J ExpIntegr Med Jul-Sep 2014.Vol 4.Issue 3.

3. AdnanHafeez, Muhammad Farooq Kamran, Rai Tariq Masood, Muhammad AamirGhafoorChaudhary, Waqarali. A retrospective study of partial edentulism and its rehabilitation at a tertiary care centre at Islamabad. Pakistan oral &dental journal vol 37, no.4 (october-december 2017).

4. Nirupama R, Shetty M, Prasad DK. Partial edentulousness and its correlation to the educational status of the population in southwest coastal region .of India. Int Dent Med J Adv Res 2017;3:1-4.

5. Madhankumar S, Mohamed K, Natarajan S, Kumar VA,AthibanI,PadmanabhanTV.Prevalence of partial edentulousness among the patients reporting to the Department of prosthodontics Sri RamachandraUniversity Chennai, India: An epidemiological study. J Pharm BioallSci 2015; 7:S643-7

6. AndreiaMontandon, ElizangelaZuza and Benedicto Egbert Toledo. Prevalence and reasons for tooth loss in a sample from a Dental Clinic in Brazil.International Journal of Dentistry.Vol 2012,Article ID 719750,5 pages.

7. SanjnaNayar, S.Bhuminathan, J.SriNisha,Ganesh Ramesh and K.Sujitha. Edentulism and Public Awareness-An Epidemiological Study.Biomed&Pharmacol.J.Vol .6(1).77-81(2013).

8. Raisa Rashid, Waseem-ul-Ayoub. Partial Edentulism and its Association with Age and Gender. International Journal of Engineering Science and Computing, Sep2017, Vol 7 Issue No 9.

9. George B, John J, Saravanan S, Arumugham IM. Prevalence of permanent tooth loss among children and adults in a suburban area of Chennai Indian.

10. Dr.Trupti,M.Dahane,Rasika.S,Jibhakate,Dr.GodboleS.R,Sonia Aswale,DeepikaRathiandPriyankaKhungale. Study of prevalence and association factors of pattern of partial edentulism in rural patients reported to SharadPawar Dental College and Hospital.International Journal of Current Research.Vol 10, Issue, II, pages 75535-75537, November, 2018.

11. Yahia Abdullah Alyami, Munirah Mari Alqahtani, Abdullah Mahdi Al Yami, Jaber Mahdi Alyami, EssaSaleh Al mottah, Nasser NajiAlalhareth ,Ali Mohammed Almakrami, Faleh Mahdi Alghubari. Pattern of partial edentulism among Najranian subpopulation and its association with related factors.Journal of International Medicine and Dentistry 2017;4(3):86-94.

12. Hoshang Khalid Abdel-Rahman, ChimanDhahir Tahir, Mahabad Mahmud Saleh.Incidence of partial edentulism and its relation with age and gender.ZancoJ,Med.Sci., Vol 17,No(2),2013.

13. ManalShubita Evaluation of partial edentulism based on Kennedy's Classification and its relation with age and gender. Pakistan oral and Dental Journal, Vol.35, No.4 , (December 2015).

14. JodatAskari, MahaSaeed, Feroze Ali Kalhoro, Mansoor Ahmed Channa, Kelash Kumar .Type of partially edentulous mandibular arches seen among patients at the dental clinics ofRak College of Dental Sciences. Pakistan Oral and Dental Journal Vol 37, No.2.April-June 2017.

15. ZiaullahChaudhary, PardeepKumar, MuhammedAmin, SofiaMalik. Kennedy's Classification-A Study done at Dow

International Dental Hospital. Pakistan Oral and Dental Journal Vol36, No.4(Oct-Dec 2016).