

PATTERNS OF PARTIAL EDENTULISM AMONG ARMED FORCES PERSONNEL REPORTING AT ARMED FORCES INSTITUTE OF DENTISTRY PAKISTAN

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ABSTRACT

Aim of this study was to determine of the frequency of occurrence of various patterns of partial edentulism in armed forces personnel seen at the department of Prosthodontics, Armed Forces Institute of Dentistry (AFID). Utilizing convenience sampling 1000 patients were selected. Kennedy's Classification was utilized after applying Applegate's rules to record the patterns of partial edentulism. Partial edentulism in maxillary arch, was found in 32.6% patients, while 36.8% personnel had partial edentulism in mandibular arch. The remaining 30.6% of samples had missing teeth in both arches. Kennedy's Class III was found to be the most prevalent pattern in both maxilla and mandible. Kennedy's Class III modification 1 was the most common modification encountered in both arches. Highest percentage of combination pattern found was maxillary Class III opposing mandibular Class III.

A higher frequency of partial edentulism among the younger age groups found in this study was alarming and is suggestive of the need to create awareness among armed forces health care system for timely prevention of diseases causing tooth loss.

Key words: Missing, dental arch, Kennedy's class

INTRODUCTION

Teeth are the key components of the stomatognathic system. Their loss effects speech, evokes masticatory difficulties and may result in poor aesthetics which in turn impact the quality of life. Partial prosthodontic replacement is usually required to restore these functions. The design of the prosthetic replacement depends upon the pattern of partial edentulism. In the absence of a classification system, the number of possible combinations of remaining teeth, from the absence of only one tooth in one arch to the loss of all but one tooth in both arches, is very difficult to compre-

hend. A classification of partially edentulous arches not only helps to identify potential combinations of teeth to edentulous ridges, thus facilitating communication, discussion, and comprehension of the indicated prosthetic treatment among dental colleagues, students and technicians, but also facilitates case history recording and simplifies information exchange between dentists and the auxiliary staff.¹⁻³

More than 65000 possible combinations of teeth and edentulous spaces in opposing arches have been estimated to exist. Several methods of partial edentulism classification, on the basis of potential

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combinations of teeth to ridges, have been reported in the literature.⁴⁻⁸ All proposed classifications have merits and demerits. At present, Kennedy's classification is the most widely used and accepted because of its simplicity, ease of application to all semi-dentulous situations, immediate visualization of the type of partially edentulous arch being considered and differentiation between tooth borne and tooth tissue borne partial dentures.⁹ It also permits a logical approach to the problems of design apart from making possible the application of sound principles of partial denture design. By this classification a tremendous number of possible semi dentulous combinations have been reduced to four simple groups namely Class I, Class II, Class III and Class IV.

Application of Kennedy's classification is however difficult in every situation without employment of certain rules, recommended by Applegate aimed at integrating, the factual clinical situations and appliance designs within the classification.^{4,10-11}

Only a few studies have evaluated the occurrence of partial edentulism among dental patients in Pakistan.

METHODOLOGY

This descriptive study was carried out at the Department of Prosthodontics of Armed Forces Institute of Dentistry, Rawalpindi, Pakistan. Convenience sampling technique was utilized for sample collection of 1000 patients. The inclusion criteria consisted of patients from both genders, above the age of 15 years, having partially edentulous areas in either or both jaws. Completely edentulous patients and those with only missing maxillary and mandibular third molars were excluded from the study. The selected patients were divided into five groups, according to age. Group A consisted of patients between 15-20 years of age; Group B had patients of age 21-30 years. Patients in Group C were between 31-40 years, while those in Group D and E were between the ages of 41-50 years and over 50 years respectively.

Thorough clinical examination of both the dental arches of each patient was carried out after consent. Patterns of partial edentulism were recorded and data collected was registered onto a proforma. Descriptive statistics was carried out using SPSS version 10.

RESULTS

Out of the patients examined (n=1000), 77.1% were male while 22.9% were female. The mean age was 35.3 ± 9.5 years. The lowest number of patients belonged to group A, n=22 (2.2%), while group B consisted of highest number of patients n=366 (36.6%). Groups C, D and E consisted of 33.3% (n=333), 23.6% (n=236) and 4.3% (n=43) of the patients respectively, as shown in Fig 1.

Frequency of partial edentulism was higher in mandibular arch being 67.4%, as compared to 63.2% in maxillary arch.

On the basis of the results, patients were divided into three groups, according to arch partial edentulism, for the sake of simplicity. Partial edentulism distribution among these groups is shown in Table 1. Kennedy's Class III was found to be the most prevalent among all the three groups. The most common modification in both groups 1, 2 and 3 was Class III modification 1.

There were 40 different combinations of various Kennedy's classes observed in maxillary and mandibular arches, of patients in group 3. The most prevalent of these was maxillary class III opposing mandibular class III with a frequency of 20.3%, followed by Maxillary class III opposing mandibular class I with a frequency of 18.3%, as shown in Table 2.

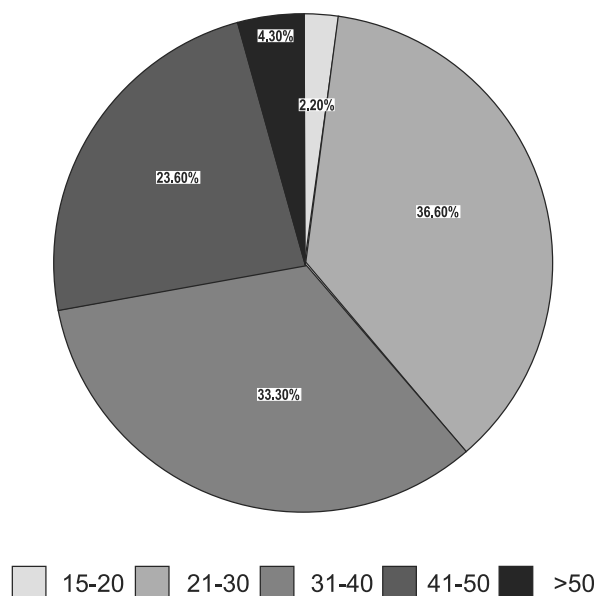


Fig 1: Percentage distribution of sample patients according to age

TABLE 1: DISTRIBUTION OF PARTIAL EDENTULISM IN GROUPS 1, 2 AND 3

| Type of partial edentulism | Maxillary arch Group 1 n = 326 | Mandibular arch Group 2 n = 368 | Both Arches; Group 3 n= 306 | |
|----------------------------|-----------------------------------|------------------------------------|-----------------------------|----------|
| | | | Maxilla | Mandible |
| Class I | 11.6% | 4% | 4.6% | 12.7% |
| Class II | 5.8% | 10.3% | 2.3% | 2.3% |
| Class III | 32.8% | 25.2% | 28.1% | 21.6% |
| Class IV | 4.6% | 6.2% | 1% | 2% |
| Class I modification 1 | 5.8% | 3.5% | 0.3% | 0.7% |
| Class I modification 2 | 1.5% | 1.0% | 0.3% | 0.3% |
| Class I modification 3 | 0.6% | 0.27% | 0% | 0% |
| Class I modification 4 | 0.3% | 0.27% | 0% | 0% |
| Class II modification 1 | 6.7% | 12.2% | 9.1% | 5.9% |
| Class II modification 2 | 3.6% | 5.1% | 2% | 2% |
| Class II modification 3 | 2.7% | 1% | 0.7% | 0.7% |
| Class II modification 4 | 0.3% | 0 | 0% | 0% |
| Class III modification 1 | 16.5% | 21.4% | 9.1% | 8.5% |
| Class III modification 2 | 4.9% | 7.3% | 4.6% | 3.2% |
| Class III modification 3 | 1.5% | 1.3% | 1.3% | 0.6% |
| Class III modification 4 | 0.3% | 0.27% | 0% | 0 |

DISCUSSION

The results of present study indicate that frequency of mandibular edentulism is higher than maxillary edentulism among our study population. This is in concordance with the study carried out by Curtis et al, at the University of California, School of Dentistry.¹² Kennedy's Class III was found to be the most common pattern of partial edentulism among all the three groups in this study; whereas Curtis found Kennedy's Class III to be predominant in the maxillary arches only, while in mandibular arches, the most prevalent pattern in that study was Kennedy's Class I. 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 our study the average age of the patients was 35.5 years.

In another study, Strattan and Wiebelt concluded that among the 3000 partially dentate mandibular arches, Kennedy's Class I was the most predominant, while Kennedy's Class III was preponderant among the 2000 partially dentate maxillary arches examined.¹ This study is in accordance with ours, as far as the maxillary arch is concerned.

Al-Dwairi in a study, investigated the frequency of different patterns of partial edentulism of 200 patients in Jordan.¹³ Out of the 200 patients, 150 had both maxillary and mandibular partial edentulism. In this

study, 350 patterns were identified, of which Kennedy class III pattern of edentulism was most commonly encountered in both maxilla (47%) and mandible (45%). Kennedy's class III in maxilla opposing a mandibular class III was the most common combination with a frequency of 30%. Although our study had a greater number of samples, its results are in agreement with Al-Dwairi's study.

In a study carried out on a Saudi population, Sadig and Idowu concluded that out of the 422 partially dentate arches examined, Kennedy's Class III was the most commonly encountered pattern of partial edentulism in both upper and lower arches and Kennedy's Class IV was the least common pattern encountered.¹⁴ Overall findings of both studies are in agreement, the reason for concord being a higher prevalence of younger age groups. Among the 422 partially dentate patients examined by Sadig and Idowu, 319 had missing teeth in both the jaws, while in our study 306 out of the 1000 patients belonged to this group. Maxillary Class III opposing mandibular Class III pattern was most common with a frequency of 22.5% in the Saudi study, which is similar to our study where the frequency was 20.3%. Kennedy's Class IV combination pattern was found to be absent in both the studies. The exceptionality of our study was the incorporation of Applegate's rules to Kennedy's classification, which lead to the recognition of 40 different combination patterns of partial edentulism.

TABLE 2: DISTRIBUTION OF COMBINATION PATTERN OF PARTIAL EDENTULISM IN GROUP 3

| Type of Partial edentulism | | Frequency | Percentage % |
|----------------------------|--------------------------|-----------|--------------|
| Maxilla | Mandible | | |
| Class III | Class I | 56 | 18.3 |
| Class I | Class III | 16 | 5.2 |
| Class III | Class III | 62 | 20.3 |
| Class III | Class IV | 6 | 2.0 |
| Class III | Class II | 8 | 2.6 |
| Class II | Class III | 6 | 2.0 |
| Class III | Class III Modification 1 | 10 | 3.3 |
| Class III modification 1 | Class III | 12 | 3.9 |
| Class III | Class II Modification 1 | 12 | 3.9 |
| Class II modification 1 | Class III | 14 | 4.6 |
| Class III modification 1 | Class II Modification 1 | 6 | 2.0 |
| Class II modification 1 | Class III Modification 1 | 6 | 2.0 |
| Class III modification 1 | Class I | 8 | 2.6 |
| Class I | Class III Modification 1 | 8 | 2.6 |
| Class IV | Class III | 4 | 1.3 |
| Class III modification 3 | Class III | 2 | .7 |
| Class IV | Class III Modification 3 | 2 | .7 |
| Class III modification 3 | Class I | 2 | .7 |
| Class II modification 3 | Class III Modification 1 | 2 | .7 |
| Class III | Class II Modification 3 | 2 | .7 |
| Class I modification 2 | Class III | 2 | .7 |
| Class II | Class I Modification 1 | 2 | .7 |
| Class I modification 1 | Class III | 2 | .7 |
| Class III modification 2 | Class I Modification 1 | 2 | .7 |
| Class III modification 1 | Class III Modification 2 | 2 | .7 |
| Class II modification 1 | Class III Modification 2 | 4 | 1.3 |
| Class II | Class II | 2 | .7 |
| Class II | Class IV | 2 | .7 |
| Class II | Class I | 2 | .7 |
| Class II modification 2 | Class III | 4 | 1.3 |
| Class III modification 2 | Class III | 8 | 2.6 |
| Class II modification 2 | Class IV | 2 | .7 |
| Class III modification 2 | Class IV | 2 | .7 |
| Class III modification 2 | Class I | 2 | .7 |
| Class I | Class I | 4 | 1.3 |
| Class II modification 1 | Class I | 4 | 1.3 |
| Class III | Class II | 4 | 1.3 |
| Class III | Class III Modification 2 | 4 | 1.3 |
| Class III | Class II Modification 2 | 6 | 2.0 |
| Class III | Class I Modification 2 | 2 | .7 |
| Total | | 306 | 100.0 |

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 in this study. Had there been a higher frequency of older population as seen in previous studies, Class III might have been replaced by Class I in the current study.

This also draws attention towards the resulting circumstances, signifying that young people losing their teeth at an early age are predisposed to a higher need for restorative treatment through their entire life, which adds to the cost of dental treatment as preventive treatment is more economical than restorative treatment.

The most common age group reporting at AFID for treatment, in this study, was 21 to 30 years followed by 31 to 40 years. This also reflects the limitation of the present study because it is known that partial edentulism increases with increasing age. The abundance of younger patient groups in this study is due to the fact that most of the personnel coming to the outpatient department at AFID belong to junior ranks. The higher frequency of partial edentulism in these younger age group patients, depicted by our results, might pertain to their low socio-economic status; poor oral hygiene and less conservative treatment approach, relating to lack of time, leading to early tooth loss.

The lower frequency of female patients in this study is probably because majority of the lower rank soldiers do not have their families residing with them as they live away from their homes.

This study, although carried in the largest dental institute in Pakistan, targeting serving, retired armed forces personnel and their families belonging to different regions of the country, cannot be considered representative of the entire population of the region in general and Pakistan Army in particular.

More studies are required to form a generalized database of the partial edentulism patterns, which will help us in identification of the causes of such tooth loss and their prevention.

CONCLUSION

This study conducted in a limited population of armed forces personnel, indicates that oral health status of armed forces personnel especially in the lower ranks and their families is poor. Higher frequency of partial edentulism among the younger age groups is

suggestive of a greater need to create awareness among armed forces health care system and army personnel about the prevalence, consequences and methods of managing oral diseases.

The need to carry out similar studies at various centers around the country, to gather information, form and maintain a national database of partial edentulism and the patterns of tooth loss, cannot be neglected. By doing so, measures can be taken to reduce the incidence of partial edentulism in the ever increasing younger population.

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