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Prosthetic Status and Treatment Needs among Patients Attending the Prosthodontic Department in a Dental Institute in India

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Abstract - *This cross-sectional study was planned to evaluate the prosthetic status and treatment needs among patients who reported to the department of prosthodontics in Institute of Dental Sciences, Belgaum. A proforma was designed consisting of questions on sociodemographic factors like age, sex, socioeconomic status and a clinical examination was carried out according to the dentition status and treatment needs using a mouth mirror and a Community Periodontal Index Probe (CPI probe). All the patients who reported to the department of prosthodontics in Institute of Dental Sciences, Belgaum in a period of 2 months, with at least one missing tooth (excluding third molars) were included in the study. There was a statistically highly significant difference between gender and age according to reasons for tooth loss, while there was no statistically significant difference between reasons for tooth loss and socioeconomic status. 58.3% of males and 59.5% of females required complete removable dental prosthesis. A statistically highly significant difference was obtained between age and type of prosthesis required by the patient. There was no statistically significant difference between socioeconomic status and the type of prosthesis required by the patient. The prosthetic status of the population was low with 65.8% of the patients needing prostheses.*

KEY WORDS: Prosthetic status, Treatment needs, Tooth loss, Type of Prosthesis

INTRODUCTION

Reports mainly from developed countries indicate that tooth loss has declined over the past two or three decades. Nevertheless, edentulism remains a problem of considerable magnitude, particularly among the older age cohorts[1,2]. People are living longer and retaining more of their teeth into old age[3]. India is the second most populous country in the world with over 1 billion persons. Of these, 7.7% are over the age of 60 years, which amounts to 77 million people. India ranks fourth amongst nations with the highest number of elderly persons[4].

Of the many issues concerning the welfare of the people, health is one of the major concerns. Tooth loss was listed as the second most frequent cause of disability amongst the elderly after cataract in a study conducted on 300 elderly of Tamil Nadu. Poor oral health and loss of teeth adversely affect the dietary intake and nutritional status compromising general health[4].

In India, tooth loss in adults was mainly attributed to periodontal disease. However, current evidence supports the fact that periodontal disease may not be the major cause of tooth loss among adults and the predominant cause of tooth loss even among the elderly is now considered to be dental caries. Moreover, apart from oral disease various non-disease indicators such as socio-demographic factors, dental attitudes and dental utilization behaviors have shown to be associated with tooth mortality. Tooth loss is therefore considered as an outcome of a complex interaction between disease and non-disease entities[1].

Prosthodontic rehabilitation has the ability to reduce and in many respects eliminate the deficits attributable to lost teeth, and patients of all ages, properly motivated, can adapt to dental. Dolan et al[5] presented evidence that practicing dentists may underestimate the value of prosthodontic services to older adults because of the mistaken belief that the elderly patient either cannot withstand the treatment or will not live long enough to merit expending resources for oral rehabilitation. Yet the decision of whether or not to undergo prosthodontic treatment belongs to the patient, who when properly educated about the dental aspects of the decision can best weigh his or her own priorities[5].

The health care system is moving toward managed care, and because prevention is less costly than the treatment of disease, the ability to diagnose and treat caries and periodontal disease early needs to be improved[6]. Factors beyond oral status are also important when estimating treatment need. These include general health of the patient, discomfort, patient-perceived need for treatment, and desire for treatment[7]. Donovan et al[8] noted that "although the advent of successful osseointegration has dramatically reduced the need for removable prostheses, there are still many patients who for health, anatomic, psychological, or financial reasons are not candidates for implants."

Epidemiological data on health and its related issues are very important in order to plan for future health care provision. Data on prosthetic status and treatment needs, in Indian population is scanty. Therefore, this cross-sectional study was planned to evaluate the prosthetic status

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and treatment needs among patients who reported to the department of prosthodontics in Institute of Dental Sciences, Belgaum.

MATERIAL AND METHODS

A cross-sectional survey regarding prosthetic status and treatment needs was conducted. Ethical clearance was obtained from the institute for conducting the study. A proforma was designed consisting of questions on sociodemographic factors like age, sex, socioeconomic status and a clinical examination was carried out according to the dentition status and treatment needs using a mouth mirror and a Community Periodontal Index Probe (CPI probe)[9]. Kuppuswamy's socio-economic classification, which took into account the education level, monthly income and occupation was used to classify the socio-economic status of the patients[10]. Dentition status and treatment needs assessed the number of teeth lost by dental caries, periodontal diseases, number of existing prostheses (if any) and a detailed prosthodontic treatment requirement (Complete removable dental prosthesis, Partial removable dental prosthesis, Fixed dental prosthesis or Implant prosthesis) based on the clinical assessment of the operator and patient's acceptability of the type of treatment. A pilot study was conducted with 20 patients to check the intra-examiner reliability, which was calculated using kappa coefficient (0.8). These patients were excluded from the final study. All the patients who reported to the department of prosthodontics in Institute of Dental Sciences, Belgaum in a period of 2 months, with at least one missing tooth (excluding third molars) were included after taking their consent for the study. There were a total of 365 patients (185 females and 180 males) within the age group of 16-84 years (mean age 51.06±16.47 years) who fulfilled this criterion. Collected data was statistically analyzed using 'chi' square test at a significance level of $p<0.05$. The power of the study was 80%. All data were analysed using statistical software (SPSS for Windows, version 11; SPSS Inc., Chicago, Ill).

RESULTS

In the present study, among 365 patients (185 females and 180 males) 215 patients (58.9%) were completely edentulous, 150 (41.1%) partially edentulous, 29 (8%) edentulous in the anterior region only, 53 (14.5%) edentulous in the posterior region only, 283 (77.5%) edentulous both in the anterior and posterior regions, 125 patients (34.3%) were using prosthesis and 240 patients (65.8%) were not using prosthesis (Table1). The age ranged from16-84 years (mean age 51.06±16.47 years).

26.5% of females and 15% of males lost teeth because of dental caries, 16.7% of males and 5.4% of females lost teeth because of reasons other than dental caries. The mean tooth loss was 4.14±3.29 due to dental caries and 5.45±5.75 due to reasons other than dental caries. An approximately equal number of patients in both sexes had lost teeth because of a combination of reasons. There was a statistically highly significant difference between males and females according to reasons for tooth loss (χ^2= 16.34, $P<0.001$). Dental caries led to tooth loss in the younger age group while multiple causes (dental caries, periodontal disease, trauma etc.) resulted in tooth loss in the older age group. There was a statistically highly significant difference between age and reasons for tooth loss (χ^2= 132.58, $P<0.001$). The majority of the patients lost their teeth because of multiple causes irrespective of socioeconomic status. There was no statistically significant difference between reasons for tooth loss and socioeconomic status (χ^2=9.89, P=0.27) (Table 2). The majority of the patients in the younger age group had only posterior teeth missing resulting from dental caries. Older age groups had both anterior and posterior teeth missing for reasons other than dental caries (Table 3).

58.3% of males and 59.5% of females required complete removable dental prosthesis. There was no statistically significant difference between males and females according to the type of prosthesis required (χ^2=1.75, P=0.882). With advancing age there was increase in the number of complete removable dental prosthesis required. A statistically highly significant difference was obtained between age and type of prosthesis required by the patient (χ^2=234.82, $P<0.001$). There was no statistically significant difference between socioeconomic status and the type of prosthesis required by the patient (χ^2=23.63, P=0.25) (Table 4). Among the 125 patients with prosthesis, almost an equal number of male and female patients were using prostheses. With advancing age more number of patients reported using prosthesis. Patients in Class I and Class V socioeconomic status reported with few prosthesis (Table 5).

Table 1. *Distribution of patient's according to sex, dentition status and prosthetic status*

	Characteristic	*No. of patients*	*% of patients*
Sex	Male	180	49.3
	Female	185	50.7
	Total	365	100.0
Type of edentulousness	Completely edentulous	215	58.9
	Partially edentulous	150	41.1
Area of edentulousness	Anterior region only	29	8.0
	Posterior region only	53	14.5
	Both in anterior and posterior regions	283	77.5
Use of prosthesis	Not using prosthesis	240	65.8
	Using prosthesis	125	34.3

Table 2. *Distribution of patients according to sex, age, socioeconomic status and reasons for tooth loss*

		Dental Caries	*Reasons other than dental caries*	*Multiple causes*	χ^2 *P value*
Sex	Male (n=180)	27 (15%)	30 (16.7%)	123 (68.3%)	16.34 P<0.001
	Female(n=185)	49 (26.5%)	10 (5.4%)	126 (68.1%)	
Age	16-25 (n=35)	17 (48.6%)	14 (40%)	04 (11.4%)	132.58 P<0.001
	26-35 (n=42)	22 (52.4%)	11 (26.2%)	09 (21.4%)	
	36-45 (n=43)	11 (25.6%)	03 (7%)	29 (67.4%)	
	46-55 (n=92)	11 (12%)	04 (4.3%)	77 (83.7%)	
	56-65 (n=85)	08 (9.4%)	03 (3.5%)	74 (87.1%)	
	66-75 (n=51)	06 (11.8%)	05 (9.8%)	40 (78.4%)	
	76-85 (n=17)	01 (5.9%)	0	16 (94.1%)	
SES	I (n=4)	02 (50%)	0	02 (50%)	9.89 P=0.27
	II (n=45)	12 (26.7%)	06 (13.3%)	27 (60%)	
	III (n=83)	17 (20.5%)	11 (13.2%)	55 (66.3%)	
	IV (n=184)	32 (17.4%)	22 (12%)	130 (70.6%)	
	V (n=49)	13 (26.5%)	01 (2.1%)	35(71.4%)	

Significant difference for P<.05

Table 3. *Distribution of patients according to age and pattern of tooth loss*

Age	*Reasons for tooth loss*	*Only anterior teeth missing*	*Only posterior teeth missing*	*Teeth missing both in anterior and posterior region*
16-25 (n=35)	Dental Caries	1(2.9%)	15(42.8%)	1(2.9%)
	Other than dental caries	14(40%)	0	1(2.9%)
	Multiple causes	0	0	3(8.5%)
26-35 (n=42)	Dental Caries	1(2.4%)	17(40.5%)	4(9.5%)
	Other than dental caries	9(21.4%)	1(2.4%)	4(9.5%)
	Multiple causes	0	0	6(14.3%)
36-45 (n=43)	Dental Caries	1(2.3%)	5(11.6%)	5(11.6%)
	Other than dental caries	1(2.3%)	0	24(55.8%)
	Multiple causes	1(2.3%)	0	6(13.9%)
46-55 (n=92)	Dental Caries	0	6(6.5%)	5(5.4%)
	Other than dental caries	1(1.1%)	0	73(79.3%)
	Multiple causes	0	0	7(7.6%)
56-65 (n=85)	Dental Caries	0	4(4.7%)	4(4.7%)
	Other than dental caries	0	0	69(81.2%)
	Multiple causes	0	0	8(9.4%)
66-75 (n=51)	Dental Caries	0	3(5.9%)	3(5.9%)
	Other than dental caries	0	1(1.9%)	42(82.4%)
	Multiple causes	0	0	2(3.9%)
76-85 (n=17)	Dental Caries	0	1(5.9%)	0
	Other than dental caries	0	0	15(88.2%)
	Multiple causes	0	0	1(5.9%)

Table 4. *Distribution of patients according to sex, age, socioeconomic status and type of prosthesis required*

		Complete removable dental prosthesis	*Partial removable dental prosthesis*	*Fixed dental prosthesis*	*Implant prosthesis*	*Combination*	*No prosthesis required*	χ^2 *P value*
Sex	Male (n=180)	105 (58.3%)	44 (24.5%)	15 (8.3%)	09(5%)	02 (1.1%)	05 (2.8%)	1.75 P=0.882
	Female(n=185)	110 (59.5%)	41 (22.2%)	20(10.8%)	10(5.4%)	01 (0.5%)	03 (1.6%)	
Age	16-25 (n=35)	01(2.9%)	04 (11.4%)	12 (34.3%)	13 (37.1%)	0	05 (14.3%)	234.82 P<0.001
	26-35 (n=42)	03 (7.1%)	24 (57.1%)	10 (23.8%)	02(4.8%)	1 (2.4%)	02 (4.8%)	
	36-45 (n=43)	22 (51.2%)	15 (34.9%)	03 (7.0%)	02(4.6%)	1 (2.3%)	0	
	46-55 (n=92)	70 (76.1%)	15 (16.3%)	06 (6.5%)	01(1.1%)	0	0	
	56-65 (n=85)	66 (77.6%)	16 (18.8%)	01 (1.2%)	01(1.2%)	01 (1.2%)	0	
	66-75 (n=51)	38 (74.5%)	09 (17.6%)	03 (5.9%)	0	0	01 (2.0%)	
	76-85 (n=17)	15 (88.2%)	02 (11.8%)	0	0	0	0	
SES	I (n=4)	02 (50%)	01(25%)	0	01(25%)	0	0	23.63 P=0.25
	II (n=45)	25(55.6%)	13(28.9%)	03(6.7%)	01(2.2%)	02 (4.4%)	01 (2.2%)	
	III (n=83)	44 (53%)	21(25.3%)	13(15.7%)	03(3.6%)	0	02 (2.4%)	
	IV (n=184)	115 (62.5%)	40(21.7%)	14(7.6%)	10(5.4%)	0	05 (2.8%)	
	V (n=49)	29 (59.2%)	10(20.4%)	05(10.2%)	04(8.2%)	01 (2%)	0	

Significant difference for P<.05

Table 5. *Distribution of patients according to sex, age, socioeconomic status and number of patients with prosthesis*

		No. of patients with rosthesis(n=125)
Sex	Male	67 (53.6%)
	Female	58 (46.4%)
Age	16-25 (n=35)	12 (9.6%)
	26-35 (n=42)	9 (7.2%)
	36-45 (n=43)	11 (8.8%)
	46-55 (n=92)	30 (24%)
	56-65 (n=85)	31 (24.8%)
	66-75 (n=51)	21 (16.8%)
	76-85 (n=17)	11 (8.8%)
SES	I (n=4)	2 (1.6%)
	II (n=45)	23 (18.4%)
	III (n= 83)	28 (22.4%)
	IV(n=184)	63 (50.4%)
	V (n=49)	9 (7.2%)

DISCUSSION

De Van stated that "The patient's fundamental need is the continued preservation of what remains of his chewing apparatus rather than the meticulous restoration of what is missing, since what is lost is in a sense irretrievably lost"[11]. Planning of treatment is essential for good prognosis. It also helps to prepare the patient psychologically for the type of treatment they will receive without any unrealistic imagination of the treatment. 365 patients reported for the study with an equal number of males and females. 65.8% of patients were not using prostheses, reflecting the less awareness or low felt needs of the patients. A study by Shah et al.[4] also found a very low level of denture wearing in the Indian elderly. They reported only <50% of those needing complete dentures and <13% of those needing partial dentures were wearing dentures. Availability, accessibility, acceptability and affordability of dental services might be the potential barriers for people to seek timely advice and treatment. The majority of the patients in the present study had missing teeth in both anterior and posterior region rather than in a single region. Patients who had more number of missing teeth or were completely edentulous might have sought treatment due to loss of function more frequently than partially edentulous patients.

Dental caries was the causative agent for the loss of teeth in 26.5% of females and 15% of males. The results of our study were in agreement with that of Lin et a.[12] where women showed less periodontal disease but more decayed teeth. Men and women have differences in prevalence of certain diseases, their severity, response to the disease and the medications, as well as health care utilization pattern[13].

Patients in the younger age group reported tooth loss because of caries. The likelihood of tooth loss increases with age as a result of the cumulative effects of caries, periodontal disease and trauma[14]. In the present study, categorization of reasons for tooth loss was made for the younger age group while for the older age group multiple reasons for tooth loss were given. Young patients tend to have lost fewer teeth so the reasons for tooth loss are easy for them to recollect, while older patients lose more teeth so the reasons for tooth loss may be difficult to recall. Completely edentulous patients were categorized under tooth lost because of multiple reasons as it would be difficult for the patient to recollect the reasons for tooth loss.

No statistically significant difference was found between reasons for tooth loss and socioeconomic status. This could be as the present study was a hospital-based study with the availability of free denture treatment and few patients reporting from Class I and Class V socioeconomic status. Marcus et al[15] stated that socioeconomic status was negatively associated with edentulism. Edentulism was negatively related to both education and income levels. Individuals with greater financial resources have better access to dental care. Those who have attained higher levels of education

are more apt to have greater financial opportunity and to place a higher priority on dental health.

In this study, neither diagnostic casts nor radiographs were made for deciding the treatment plan but treatment was decided based on the clinical judgment of the. There was no statistically significant difference between sex and socioeconomic status according to the type of prosthesis. With advancing age there was an increase in the number of complete removable dental prosthesis required. Davenport et al.[3] revealed that the older age groups were more negatively inclined towards the wearing of removable partial dentures than younger individuals. The longer a person had managed to function adequately without a removable partial denture, the greater the reluctance to resort to such a device.

In this study, the exact prevalence of prosthetic status and treatment needs could not be obtained. However, it would provide some information on the type of edentulousness and the amount of resources in terms of materials, manpower and time required to rehabilitate these patients with dental prostheses.

CONCLUSION

It can be concluded that the prosthetic status of the population was low with 65.8% of the patients needing prostheses. However, a field survey with larger sample size should be carried out to know the exact prevalence of edentulousness, prosthetic status and treatment needs.

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