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INFLUENCE OF PROSTHODONTIC STATUS ON CARIES AMONG ADULT RURAL POPULATION OF MANGALORE TALUK

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ABSTRACT

Background: Dental prosthesis may also influence the risk of caries and the amount of stress on natural teeth. Many patients fail to keep their dentures clean and continue to use unclean dentures. This may be a result of lack of reinforcement about hygiene methods from clinicians and failure of patients to attend periodic recalls.

Methodology: A cross-sectional survey was carried out on 1041 partially edentulous subjects aged 18 years and older. a house-to-house survey was conducted to determine the prevalence of caries among dental prosthesis wearers and remaining population of Mangalore taluk, Karnataka State, India using a pretested proforma. Data collected were analyzed using chi-square test.

Results: Dental caries was high among RPD wearers among all age groups and education level. Men wearing RPD showed higher prevalence of dental caries.

Conclusion: It is essential to institute structured recall visits and reinforce oral hygiene habits effectively in a timely manner to target population.

Keywords: Dental caries, prosthodontics status, RPD wearers, dental prosthesis

INTRODUCTION

The incidence of dental caries and periodontal diseases result in considerable number of tooth loss. The prevalence of these diseases is continuously increasing due to various factors like dietary habits of people, socio economic status, literacy level **[1]**, oral hygiene practices, smoking or chewing tobacco, lack of awareness **[2]** and sometimes due to limited access to health care facilities. Dental prosthesis may also influence the risk of caries and the amount of stress on natural teeth **[3-5]**. Many patients fail to keep their dentures clean and continue to use unclean dentures **[6-8]**. This may be a result of lack of reinforcement about hygiene methods from clinicians and failure of patients to attend periodic recalls. Lack of optimal hygiene combined with physiological changes has significant negative effect on supporting tissues and may further impair function of removable prostheses. The difference in oral hygiene habits and attitudes may be related to number of factors such as education, gender, social status or age. Studies showed that RPD wearers have more root caries, particularly on abutment teeth **[9, 10]**.

Wearing Cobalt Chromium (Co-Cr) RPD was related to a higher prevalence, high incidence of root caries **[5]**. Few studies reported the contrary, that RPDs per se did not necessarily cause any harmful effects if good oral hygiene measures and continual professional dental care were provided to the patients **[11]** and the use of RPD reduced the prevalence of caries.[12] In view of this disagreement, and taking into consideration of the lack of studies that evaluate the effect of RPD on oral structure in the Mangalore Taluk, it becomes necessary to investigate the effect of dental prosthesis on the oral tissues regarding periodontal condition and incidence of caries.

METHODOLOGY

A cross-sectional survey was carried out on 1041 partially edentulous subjects aged 18 years and older. Sixteen gram panchayats were selected by simple random sampling and a house-to-house survey was conducted to determine the prevalence of caries among dental prosthesis wearers and remaining population of Mangalore taluk, Karnataka State, India. The following were the inclusion criteria: (i) The population in the age range of 18 years and above (ii) Partially edentulous (iii) Consent for participation in the study

Patients, who refused for the dental check-up and those who had full complement of teeth, were excluded from the study.

A pretested proforma was used for data collection. It consisted of two parts—the 1st part recorded data on socio-demographic factors (age, gender, educational status,

occupation etc), while the 2nd part contained a section of the World Health Organization (WHO) Oral Health Assessment Form (1997)[13] to record the dentition status.

Data collected were analyzed using chi-square test. $P < 0.05$ was considered as significant.

RESULTS

Out of 1041 partially edentulous subjects,406 were prosthetic wearers, out of which 150 subjects had caries and 635 were non prosthetic wearies, out of which 244 subjects had caries.

The subjects were divided into four age groups: 10.82% of 18–30 years, 37.42% of 31–45 years, 24% of 46–60 years, and 27.74% of >61 years. On the basis of the education, 9.60% of the subjects were illiterate, and 27.89% subjects had primary education.

Table 1 shows the distribution of study subjects according to prevalence of dental caries and age group. Prevalence of dental caries was high among non-prosthetic wearers. Dental caries was high among RPD wearers. It was highest among 31 to 45 age group and lowest in 18 to 30 age group.

Table 2 shows the distribution of study subjects according to prevalence of dental caries and gender. Men wearing RPD showed higher prevalence of dental caries. Prevalence of dental caries was high among females among non-prosthetic wearers. But the difference was not found statistically significant.

Table 3 shows the distribution of study subjects according to prevalence of dental caries and education level. Dental caries was highest among RPD wearers in all the categories of education. Prevalence of Dental caries among non-prosthetic wearers is higher among illiterates followed by secondary and primary educated individuals.

Table 1: Distribution of study subjects according to prevalence of dental caries and age group

Dental caries	Age group							
	18-30		31-45		46-60		>61	
	Yes	No	Yes	No	Yes	No	Yes	No
RPD	10(2%)	6(6%)	73(45%)	81(27%)	21(25%)	52(28%)	16(16%)	38(56%)
FPD	3(6%)	17(18%)	4(2.4%)	33(20%)	6(5%)	7(4%)	4(4%)	5(7%)
Combination	2(23%)	1(2%)	5(3%)	9(3%)	2(5.2%)	4 (2%)	4(4%)	3(4%)
Non Prosthetic wearers	33(69%)	70(74%)	81(32%)	178(65%)	51(67%)	121(66%)	79(76%)	22(33%)
Total	48(100%)	94(100%)	163(100%)	301(100%)	80(100%)	184(100%)	103(100%)	68(100%)

X^2=11.6, p=0.070

Table 2: Distribution of study subjects according to prevalence of dental and gender

Dental caries	Gender			
	Male		Female	
	Yes	No	Yes	No
Prosthetic wearers				
RPD	55(42%)	73(26%)	65(31%)	104 (25%)
Fixed	9(7%)	31(11%)	8(4%)	32 (8%)
Combination	5(4%)	4(1%)	10(5%)	11 (3%)
	63(47%)	172 (62%)	124(60%)	276(64%)
Non-Prosthetic wearers	132 (100%)	280(100%)	207(100%)	423(100%)
Total				

$X^2 = 1.28, p = 0.527$

Table 3: Distribution of study subjects according to prevalence of dental caries and education level

Periodontal disease	Education											
	Illiterate		Primary		Secondary		PUC		Graduate		Post graduate	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Prosthetic wearers												
RPD	3(10%)	7(9.5%)	12(15%)	38 (16%)	22(16%)	19(23%)	36(47%)	58(47.5%)	40(62.5%)	33(40%)	14(64%)	15(42%)
Fixed	2(6%)	1(1.5%)	6(7.5%)	9(4%)	2(1.4%)	19(23%)	2(2%)	14(11.4%)	5(7.8%)	17(20.4%)	0(0.0%)	3(8%)
Combination	0(0.0%)	0(0.0%)	4(5.5%)	5(2%)	3(2.6%)	2(2%)	5(6%)	2(2.1%)	1(1.7%)	5(5.6%)	0(0.0%)	3(8%)
Non Prosthetic wearers	26(84%)	65(89%)	58(72%)	183(78%)	109(80%)	43(52%)	34(45%)	48(39%)	18(28%)	28(34%)	8(36%)	15(42%)
Total	31(100%)	73(100%)	80(100%)	235(0.0%)	136(100%)	83(100%)	77(100%)	122(100%)	64(100%)	83(100%)	22(0.0%)	36(100%)

$X^2 = 22.9, p < 0.01$

DISCUSSION

Literature search revealed that the issue of dental caries among prosthetic wearers in relation to gender and education has limited discussion. The present study showed that dental caries was high among RPD wearers in all the age groups. Caries was found to be (59%) among RPD wearers and (26%) among FPD wearers. This finding is in agreement with studies by Jepson *et al*. **[14]** revealed (23%) caries in FPD wearers and (74%) caries in RPD wearers. The authors **[15, 16]** reasoned that the incidence in caries was due to increased plaque levels associated with gingival coverage while Jorgensen *et al*. **[17]** had a contradicting reason, they reported incidence of caries 6 times more among partial denture wearers than FPD wearers in which the dentures were designed to avoid gingival coverage. In his study the risk of caries was much higher in the RPD group than in the FPD group inspite of following same oral hygiene measures. The reason given by them was that the denture wearers develop a more caries-active plaque and that the RPDs contributed more to plaque accumulation than the FPDs. In addition, the number of tooth surfaces at caries risk was possibly higher in the RPD group than in the FPD group, since relatively few teeth had been restored with crowns in the RPD group. Few studies Drake (1993) **[18]**, AlSheikh *et al.,* (2015) **[19]** analysed caries among RPD wearers also revealed that the abutment

teeth developed caries more frequently than the non-abutment teeth. They stated that abutment teeth appeared to suffer the most deleterious effects.

Though findings of the above studies were similar to the present study, they were based on the categorisation of the teeth as abutment and non-abutment and gingivally covered and non- covered by the prosthesis whereas in the present study the teeth of the subjects were not categorized and the findings of all the teeth were combined . No comparison was made between teeth in contact with and those not in contact with RPDs.

Yeung *et al.,* (2000) **[5]** showed low incidence of caries among dental prosthetic wearers ,but their studies involved periodic instruction of oral hygiene measures among RPD wearers and use of fluoridated water.

When gender and incidence of caries was assessed it was found that men wearing RPD showed higher prevalence of dental caries, this may be due to the lack of maintenance of oral hygiene and also due to the lack of awareness of the consequences of neglecting the oral and prosthesis hygiene . Prevalence of dental caries was high among females among non-prosthetic wearers may due to neglecting the oral hygiene.

When education level was compared, non-prosthetic wearers had higher incidence of caries among illiterates, primary and secondary educated participants. This clearly denotes the lack of awareness of oral hygiene measures and importance of oral hygiene among prosthetic wearer in the population studied **[20, 21]**. But Rodan *et al.,* (2012) **[22]** found that non prosthetic wearers had significantly less caries than prosthetic wearers. Wearing removable partial dentures increased the likelihood of coronal and root surface caries **[23]**.

In the present study though dental caries was found to be high among RPD wearers than FPD wearers and among non-prosthetic wearers than prosthetic wearers, which clearly denotes that there could be other interrelated factors contributing to caries like ineffective oral hygiene habits **[24]**, frequency of dental visit and duration of wear **[25]**.

CONCLUSION

It is essential to institute structured recall visits and reinforce oral hygiene habits effectively in a timely manner to target population. In order to do so we need to assess the awareness and knowledge level of the target population and then, not only provide treatment to them but also provide effective dental health education.

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