

Received on 25 June 2018; received in revised form, 21 August 2018; accepted, 28 August 2018; published 01 September 2018

RESTORATIVE STATUS AND PREVALENCE OF CARIES IN PATIENTS WITH REMOVABLE PARTIAL DENTURE

L. Sri Varsha* and S. Jayalakshmi

Saveetha Dental College, Velappanchavadi, Chennai - 600077, Tamil Nadu, India.

ABSTRACT: Aim: To study the status of restoration and prevalence of caries in patients with removable partial denture. **Materials and Method:** Case sheets of 100 RPD (removable partial denture) patients were collected, and the prevalence of caries and restorative status were assessed from it. **Results:** From the 100 subjects, 36% of the RPD patients had caries. Based on the restorative status, 12 subjects did not undergo any restorative treatment, while the rest had undergone restoration. **Conclusion:** The prevalence of caries in patients with RPD was found to be higher than that of patients with a fixed partial denture (FPD). Therefore, alterations can be made in the design of RPD such that it will reduce the incidence of caries in RPD wearers. Awareness of oral hygiene should be given to patients with RPD.

Keywords: Caries, Biofilm, Restorative material, RPD patients

Correspondence to Author:

L. Sri Varsha

Saveetha Dental College, Velappanchavadi, Chennai - 600077, Tamil Nadu, India.

E-mail: varsha9711@yahoo.co.in

INTRODUCTION: Dental caries, otherwise known as tooth decay, is one of the most common chronic diseases worldwide. Dental caries forms through a complex interaction over time between acid-producing bacteria and fermentable carbohydrates, and many host factors, including teeth and saliva¹. A removable partial denture (RPD) is a denture for a partially edentulous patient who desires to have replacement teeth for functional or aesthetic reasons where conditions do not permit to give FPDs.

Indications of RPD:²

- Excessive alveolar bone loss.

- Reduced periodontal support of remaining teeth.
- Cross arch stabilization of teeth.
- Lengthy edentulous span.
- Lack of teeth to support as an abutment.
- Cost.

The risk of caries in patients with RPD is much higher than in fixed partial denture patients^{3, 4}. Tomlin and Osborne (1961) reported carious lesions in teeth supporting RPDs and other teeth in the mouths of RPD patients⁵. This study aims to observe the restorative status and prevalence of caries in patients wearing the removable partial denture.

MATERIALS AND METHODS: The prevalence of caries was assessed in 100 subjects wearing removable partial denture (RPD). The restorative statuses of the subjects were also assessed. The data was collected from case sheets from different

	<p>QUICK RESPONSE CODE</p>
	<p>DOI: 10.13040/IJPSR.0975-8232.IJLSR.4(9).151-54</p> <p>The article can be accessed online on www.ijlsr.com</p>
<p>DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.IJLSR.4(9).151-54</p>	

clinics in Saveetha Dental College, Chennai. The case sheets of RPD patients were selected, and their restorative status and caries development were assessed.

RESULTS:

TABLE 1: PREVALENCE OF CARIES IN RPD PATIENTS

Prevalence of caries in RPD patients	Out of 100	%
With caries	36	36%
Without caries	64	64%

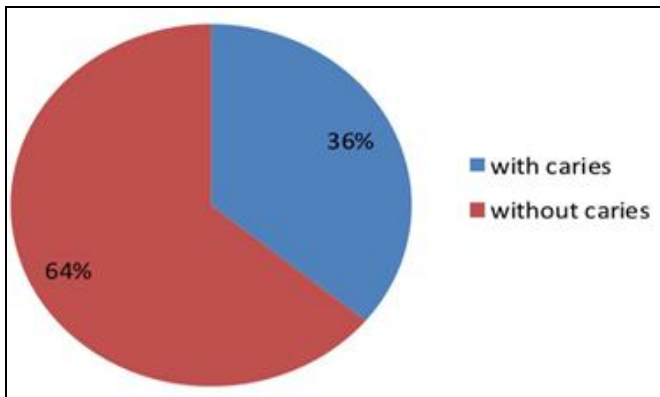


FIG. 1: PREVALENCE OF CARIES IN RPD PATIENTS

TABLE 2: TYPES OF RESTORATIVE MATERIAL USED

Restorative materials	No. of restorations done
LCR	13
Amalgam	10
GIC	3
Inlay	4

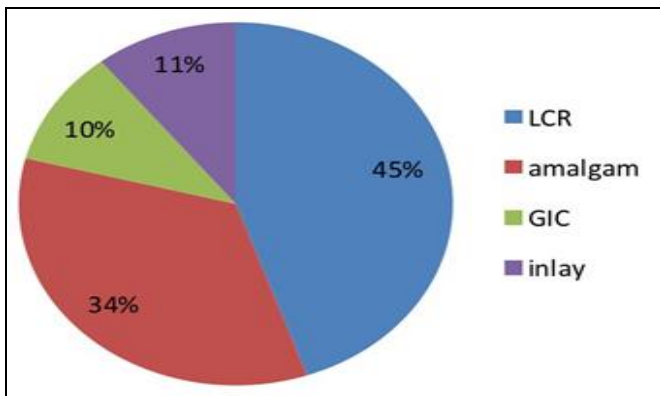


FIG. 2: RESTORATIVE STATUS OF RPD PATIENTS

From the case sheets collected, 36% of the RPD patients had caries, while the rest 64% of the RPD patients were free of caries (refer **Table 1**). When the restorative status of the patients was observed, it was found that 12 of the patients (out of 36) did not undergo any restoration. In the other 24 patients, there were 34% amalgam restorations, 45% LCR restorations, 10% GIC, and 11% inlay

restorations. **Fig. 1** and **2** show the presence of caries in RPD (removable partial denture) patients.

DISCUSSION: In this study, 36% of the RPD patients had dental caries, and 64% of RPD patients did not have dental caries. Carlsson *et al.*,⁶ (1961) analyzed periodontal health, tooth mobility, recession, tissue inflammation, and caries incidence in patients with RPDs (48 patients with a complete maxillary denture and a mandibular RPD class I) 15 months after placement. The authors observed a high prevalence of periodontal disease and caries, both in teeth supporting the RPD and other teeth. In a follow-up study, the authors⁷ observed progressions of the disease, including tooth extraction and caries more strongly associated with RPD support teeth.

Rocha *et al.*,⁸ Mihalow, and Tinanoff⁹ (2003) observed an increase in *Streptococcus mutans* in the saliva of RPD patients after prosthesis placement. This finding suggests that chemoprophylactic strategies need to be established for patients receiving RPDs to control and reduce biofilm formation and caries development, and thereby help to maintain the patient’s oral health¹⁰. Rocha *et al.*,¹¹ observed alterations in the caries index in RPD users with a higher caries index even in patients with a high level of cooperation and motivation for performing proper oral hygiene.

P. Tuominen and K. Ranta¹² (1988) found that 60.5% of single RPD patients had one or more carious teeth and 62.7% among patients wearing RPDs in both jaws. In another study,¹¹ *S. mutans* levels in saliva increased significantly 48 days after prosthesis placement, with levels above 106 UFC/mL of saliva.

The biofilm accumulation and carries index are influenced by the increase in hard surfaces in the mouth following the placement of an RPD. There is an increase in microorganism-retentive areas with the presence of an oral prosthesis, specifically the acrylic resin base and metal structure of the RPD. Further, the consumption of fermentable carbohydrates can lead to an increased caries incidence.

Using a diet diary, one study observed that RPD users had high sugar consumption in addition to what was consumed in meals, making it difficult to

control biofilm accumulation by conventional methods¹¹. This is a particular concern in elderly patients, where the presence of gingival recession favors the development of root caries. The etiology of root caries is related to *Lactobacillus* species, and indeed, one study observed that *Lactobacillus* was present in high numbers in patients with RPDs¹³. The situation will be aggravated if biofilm control is not effective, with reduction of the intraoral pH, placing the patient at risk for development of caries¹⁴.

Prevention of Caries in RPD Patients:

- ❖ RPD design should be as simple as possible, without affecting the basic principles of retention, stability, and reciprocity, and causing problems due to mechanical inefficiency.
- ❖ Prevention must be incorporated into the patient's daily routine. RPD users often have difficulty removing the biofilm, even under the supervision and after being instructed in the correct use of a toothbrush and dental floss. Thus, diet modifications should be made, and awareness about oral hygiene should be given.
- ❖ It is believed that the use of chlorhexidine gel, proposed by Maltz *et al.*,¹⁵ (1981), should be incorporated into the clinical protocol during RPD treatment. This gel is inexpensive, practical, and effective for caries reduction, and it can reduce biofilm accumulation.

Nevertheless, there are data showing the success of RPD treatment without chemical plaque control.

CONCLUSION: Based on the result of this study, we conclude that caries occurrence in patients after wearing removable partial dentures (RPD'S) is more than that in patients wearing a fixed prosthesis. This problem can be overcome by some technical improvements in the denture like better adaptation and prevention of increased biofilm formation. Traditionally, treatment planning for RPD has been based on biomechanical factors, with priority given to principles such as stability and retention. Nevertheless, RPD planning cannot be focused only on mechanical concerns because this will not guarantee a successful outcome. The RPD design should avoid food retention and biofilm formation.

Considering the strong association between the use of RPDs, biofilm accumulation, and caries, oral hygiene concerns must be incorporated into the treatment plan¹⁶. Awareness on oral hygiene maintenance should be created among RPD patients. Periodic check-ups should be done by the dentist to check the fit of a denture, health of the oral cavity and any occurrence of caries.

ACKNOWLEDGEMENT: Nil

CONFLICT OF INTEREST: Nil

REFERENCES:

1. Selwitz RH, Ismail AI and Pitts NB: Dental caries. *The Lancet* 2007; 369(9555): 51-9.
2. Wöstmann B, Budtz-Jørgensen E, Jepsen N, Mushimoto E, Palmqvist S, Sofou A and Öwal B: Indications for removable partial dentures: a literature review. *Inter Journal of Prosthodontics* 2005; 18(2): 139-45.
3. Reintsema H: Removable partial dentures in maxillo-facial prosthetics. *Nederlands tijdschriftvoortandheelkunde* 2009; 116(12): 677-85.
4. Jorge JH, Quishida CC, Vergani CE, Machado AL, Pavarina AC and Giampaolo ET: Clinical evaluation of failures in removable partial dentures. *Journal of Oral Science* 2012; 54(4): 337-42.
5. Budtz-Jørgensen E and Isidor F: A 5-year longitudinal study of cantilevered fixed partial dentures compared with removable partial dentures in a geriatric population. *The Journal of Prosthetic Dentistry* 1990; 64(1): 42-7.
6. Tomlin HR: Cobalt-chromium partial dentures. A clinical survey. *Br Dent J* 1961; 111: 307-10.
7. Carlsson GE, Hedegård B and Koivumaa KK: Studies in partial dental prosthesis. II An investigation of mandibular partial dentures with double extension saddles. *Acta Odontologica Scandinavica* 1961; 19(2): 215-37.
8. Rocha EP, Francisco SB and Del Bel Cury AA: Longitudinal study of the influence of removable partial denture and chemical control on the levels of *S.mutans* in saliva. *J Oral Rehabil* 2003; 30: 131-138.
9. Mihalow DM and Tinanoff N: The influence of removable partial dentures on the level of *Streptococcus mutans* in saliva. *Journal of Prosthetic Dentistry* 1988; 59(1): 49-51.
10. Keltjens HM, Schaeken MJ, Van der Hoeven JS and Hendriks JC: Effects of chlorhexidine gel on periodontal health of abutment teeth in patients with over dentures. *Clinical Oral Implants Research* 1991; 2(2): 71-4.
11. Bergman B, Olsson CO and Hugoson A: Periodontal and prosthetic conditions in patients treated with removable partial dentures and artificial crowns: a two-year longitudinal study. *Acta Odontologica Scandinavica* 1971; 29(6): 621-38.
12. Tuominen P, Ranta K and Paunio I: Wearing of removable partial dentures in relation to dental caries. *Journal of Oral Rehabilitation* 1988; 15(6): 515-20.
13. Närhi TO, Ainamo A and Meurman JH: Mutans Streptococci and Lactobacilli in the elderly. *European Journal of Oral Sciences* 1994; 102(2): 97-102.
14. Davenport JC, Basker RM, Heath JR, Ralph JP and Glantz PO: Prosthetics: Need and demand for treatment. *British Dental Journal* 2000; 189(7): 364.

15. Maltz M, Zickert I, Krasse B. Effect of intensive treatment with chlorhexidine on number of *Streptococcus mutans* in saliva. *European J of Oral Sciences* 1981; 89(6): 445-9.

16. Rocha EP, Luvizuto ER and Sabotto SF: Biofilm formation and caries incidence with removable partial dentures. *Dentistry Today* 2008; 27(12): 60-2.

How to cite this article:

Varsha LS and Jayalakshmi S: Restorative status and prevalence of caries in patients with removable partial denture. *Int J Life Sci & Rev* 2018; 4(9): 151-54. doi: 10.13040/IJPSR.0975-8232.IJLSR.4(9).151-54.

All © 2015 are reserved by International Journal of Life Sciences and Review. This Journal licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

This article can be downloaded to **ANDROID OS** based mobile. Scan QR Code using Code/Bar Scanner from your mobile. (Scanners are available on Google Playstore)