



A Review - Dental caries in relation to Removable Acrylic partial Denture

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Abstract

Removable acrylic partial dentures should maintain the health of the remaining dentition and surrounding oral tissue. The demand for RPD is higher because it is more affordable and easier to fabricate. But some of the disadvantages of using acrylic resin denture are increased risk of caries, gingivitis and periodontal disease relative to other RPD frame work. In addition to this in elderly age group due to gingival recession root caries is higher & RPD contributes towards high risk of caries in those group. A review study was done to assess the impact of RPD on caries prevalence. But the relationship between caries and RPD is contradictory. Apart from RPD other factors also contributes to the prevalence of dental caries.

Key Words: Removable partial denture, Dental caries, Oral hygiene

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I. Introduction

Dental caries is an irreversible microbial disease of calcified tissues of the teeth characterized by demineralization of the inorganic portion and destruction of organic substance of the tooth which often leads to cavitation[1]. Removable partial denture is a device which replaces the missing teeth & supporting tissues with a prosthesis designed to be removed by the Wearer [2]. Patient's of all age group are commonly effected by dental caries. Primary microorganisms which resulted in dental caries are the Streptococcus mutans, Streptococcus sobrinus & lactobacilli species. Initially it begins as white spot lesion in the enamel which appear as small areas of subsurface demineralization[3] & further progression results in discoloration & decay of the tooth.

Other factors such as education, occupation, income and all other socioeconomic factors also contributes towards the progression of dental caries[4].

RPD is a mechanical structure associated with biological structure which is commonly used in rehabilitation of partially edentulous area with its implementation of conservative principles and cost effective and fast treatment[5]. It has the potential of altering oral environment & increase plaque formation on tooth surface resulting in initiation and progression of caries in the oral cavity[6]. Limited studies had stated that prevalence of caries is high in RPD wearer's compare to non wearer's. So the relationship between dental caries occurrence and wearing RPD is contradictory[7]. Therefore the purpose of this review was to assess the influence of Removable acrylic partial denture in caries prevalence among partially edentulous patients.

II. Materials & Methods

A Review study was carried out in the Department of Conservative Dentistry & Endodontics JSS Dental College & Hospital [JSSDCH] JSS Academy of Higher Education & Research [JSSAHER]. The review was done based on the articles included in Pubmed, Scopus, Google Scholar & Web of Science. The articles were searched using the key words Removable partial denture & Dental caries. The required data was extracted from the result and conclusion part of the articles favoring the hypothesis of this study.

Totally twenty articles were collected, after screening six articles were considered for review among which five are original research and one review article.

Selection Criteria

The review included both original and review articles related to removable partial denture and dental caries.

Ref No Author	Clinical findings	Year	Conclusion
[7]Tuominen et al	Caries Prevalence 61.4% (n=4144) without RPD 60.5%(n=774) Single RPD user 62.7% (n=110) RPD in Both the Jaws	1988	RPD shows in both the Jaws slight increase risk of carious teeth RPD is considered as a device for accumulating plaque on tooth surface
[8] Diane M Mihalow et al	After six months of RPD insertion the mean percentage of Streptococcus mutans per total CFU in the patient's saliva was significantly increased	1988	Patient's who received RPD showed increased level of Streptococcus mutans in the saliva
[9] Paul S et al	Root caries was 2.6 times more in denture wearer's in older population	1992	Caries rate is higher in Denture wearer's compare to non denture wearer's in older population
[5] MantshumbaMiloloAugustin et al	Increased prevalence of caries seen in denture group	2016	Regular recall of patients once in six months reduce the prevalence of caries
[6] Rania Rodan et al	RPD wearer's had significantly more coronal and root surface caries compared to non wearer's	2012	Wearing of RPDs increased coronal and root surface caries
[10] Bernd Westmann et al[Review]	RPD can increase the risk of caries	2005	RPD is associated with increased risk of caries

Table 1 Indicates the original research articles and a review article included in the review

III. Results

The review of this study, in which five original research, three original research with ref no [8,9,6]&[10] one review strongly support the hypothesis of the study. In relation to RPD and caries prevalence Table 1 ref no [7] states that single RPD wearer's showed less caries prevalence compare to non wearer's and ref no [5] states that regular follow up reduce the caries prevalence in RPD wearer's.

IV. Discussion

Removable partial denture are one of the most widely accepted means of tooth replacement[6]. It's noninvasive line of treatment to the remaining dentition & demand from the economically weaker section of the society, RPD is the mode of treatment /replacement for lost teeth[10]. It inhibits the self cleansing action resulting in the accumulation of plaque favoring the progression of caries[11].

Apart from that RPD in the mouth has the potential of altering oral environment and increase plaque formation on teeth surface which are covered by the denture[6]. Studies had revealed that RPD increases the biofilm formation & increase the risk for caries, gingivitis and periodontal diseases[12]. Clasp, rest and denture base of RPD interfere with the physiological clearance of food in the oral cavity[8]. Jepson NJ et al showed that RPD have negative impact on the different aspects of oral health. It also decrease the quality of life of the patient's [13]& had detrimental effect on oral health if it is used for a long time. Shaghaghrahn et al also reported about the effect of acrylic removable partial denture on oral health[14].

In elderly age group due to gingival recession root caries is higher. In addition to that RPD exhibits higher prevalence of root caries in elderly groups[9]. Majority of root caries is considered as dental caries. patients with more number of natural teeth with RPD exhibits higher caries risk when compare to less number of natural teeth because more natural teeth surface comes in contact with denture base resulting in progression of caries. On the other hand some of the studies showed relatively low caries frequencies in RPD wearer's. Therefore apart from RPD other factors such as education, socioeconomic status and proper oral hygiene and systemic disease such as diabetes also contributes to the occurrence and prevalence of caries[7].

V. Limitations

This review gives limited data regarding the impact of Removable acrylic partial denture on quality of oral health of an individual. Further research and review has to be carried out to know the impact of RPD on oral cavity.

VI. Conclusion

Patient wearing removable acrylic partial denture are in a high risk for caries prevalence. Proper oral hygiene & regular follow up, following post insertion instruction reduce the risk of caries initiation and progression.

References

- [1]. Shafer's Text book of Oral pathology Elsevier 2005;5:567
- [2]. Deepak Nallaswamy Text book of Prosthodontics Japee 2003;1:26
- [3]. Mageshwari M, Manjula G, Mayma Nathasha, Khadijah Mohideen et al, The prevalence of dental caries in type II diabetic patients and non diabetic patients- Review. International journal of current advanced research 2018;7(9):15382-15386.
- [4]. Ann Catrin Andre Kramer, Max Petzold, Magnus Hakeberg et al, Multiple Socioeconomic Factors and Dental caries in Swedish Children and Adolescents. Caries Res 2018;52:42-50.
- [5]. Augustin, M.M, Joke, DBourleyi, S.I, Shenda L.P Fidele, N.B Gabriel et al, Risk factors of caries and periodontal diseases in the patients after 5 years Use a partial removable Denture. Open journal of Stomatology 2016;6:185-192.
- [6]. Rania Rodan, Osama AL- Jabrah, Mahasen Ajarmah, Adverse effects of removable partial dentures on periodontal status and oral health of partially edentulous patients. Journal of Royal Medical Services 2012;19(3):53-58.
- [7]. R Tuominen, K Ranta, I Paunio, Wearing of removable partial dentures in relation to dental caries. Journal of Oral Rehabilitation 1988;15:515-520.
- [8]. Diane M Mihalow, Norman Tinanoff, The influence of removable partial dentures on the level of streptococcus mutans in saliva. The Journal of Prosthetic Dentistry 1988;59(1):49-51.
- [9]. Paul S, Paul H, David Beighton, Robin Heath, Edward Lynch, Relationship of removable partial denture Use to root caries in an older population. Int J Prosthodont 1992;5:39-46.
- [10]. Bernd Wostmann, Dr Med Dent/Ejvind Budtz Jorgensen, Odont/Nick Jepson et al Indications for removable partial Dentures: A literature review The international journal of Prosthodontics 2005;18(2):139-145.
- [11]. Yoshiaki Shimura, Juro Wadachi, Teruyasu Nakamura, Hiroshi Mizutani, Yoshimasa Igarashi Influence of removable partial dentures on the formation of dental plaque on abutment teeth Journal of Prosthodontic Research 2010;54:29-35.
- [12]. Reecha Gupta, Bhavna Gupta, Bharti Dua, Mohit Gupta, Assessment of various factors for RPD failure in adult population. Journal of Advanced Medical And Dental Sciences Research 2018;6(9):32-34.
- [13]. Augustin, M.M, Joke, D, Sekelesouradi Bourleyi et al The Effect of partial removable denture use on oral health related quality of life and masticatory function, after 5 years Use Open journal of Stomatology 2016;6:201-210.
- [14]. Kuldeep S Shekhawat, Arunima Chauhan, Nansi Ramalingam, Impact of removable partial denture on quality of life measured after 6 months and 1 year of use. World journal of Dentistry 2017;8(2):81-85.