Full Length Research Article

CLINICAL EFFICACY OF VARIOUS DENTURE CLEANSERS: A SYSTEMATIC REVIEW


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ABSTRACT

Background: Complete edentulism is common in elderly population and routinely rehabilitated with removable complete dentures. Poor denture hygiene leads to microbial colonization and subsequent inflammatory changes in oral tissues.

Objective: The purpose of this article is to review the available literature with regard to efficacy of various denture cleansers in reducing microbial film formation.

Materials and Method: Electronic search of PubMed database was carried out for articles related to efficacy of denture cleansers only. Clinical studies on Human subjects published on or before April 2017 were included. The data extracted from articles included denture cleansing agent or method used, concentration of the agent, mode of action and efficacy of denture cleansing agents.

Results: The literature search yielded 49 articles which were independently screened and 13 articles were included in review. Four studies compared the efficacy of peroxide based tablets with abrasive creams. Four studies evaluated different concentrations of Chlorhexidine digluconate. Sodium hypochlorite, enzymes, vinegar etc were other substances used for the purpose of denture cleansing.

Conclusion: Denture cleansers correspond to a variety of products designed to safely remove stains, deposits, and debris from the surfaces of dental prostheses, by means of various methods. This systematic review demonstrated that oxidizing agents like alkaline peroxide based tablets are the most common product used for denture hygiene. Antimicrobials such as chlorhexidine have shown similar efficacy.

Key words:

INTRODUCTION

Despite advances in preventive dentistry, in many countries, complete edentulism is common in elderly population who are commonly rehabilitated with removable complete dentures (Guiglia et al., 2010). However, previous data have shown that poor denture hygiene is common among patients with edentulism and may contribute to biofilm and calculus deposits and the occurrence of inflammatory changes in the oral mucosa. In spite of the increase in dental awareness in patients, many leave the dental office totally uninformed on how to care for their complete dentures. A combination of mechanical and chemical methods is considered the most appropriate choice in terms of denture cleansing, providing mechanical biofilm and stain removal as well as antimicrobial action (Paranhos et al., 2007; Rossato et al., 2011). Denture stomatitis is one of the most common oral disorders in denture wearers. Proper prosthesis cleaning is important not only to prevent mucosal inflammation but also to control the presence of biofilm. The presence of biofilm is closely related to mucosal inflammation and the occurrence of infection by Candida spp (Nikawa et al., 1999).

Various chemical agents have been used in past as denture cleansers to safely remove stains, deposits, and debris from the surfaces of dental prostheses as well as for their antimicrobial effect. There are many studies evaluating the clinical efficacy of various denture cleansers. However, so far, no systematic reviews on efficacy of denture cleanser in reducing the formation of biofilm had been reported. Hence, the purpose of this article is to review the available literature with regard to efficacy of various denture cleansers in reducing microbial film formation.

MATERIALS AND METHODS

The overall search strategy is shown in Table 1. The assessment criteria were defined in accordance with the Population or Patient, Intervention, Comparison or Control, Outcome and Study type criteria. Articles related to any other effect or property of denture cleansers except reduction in microbial colonization Studies with animal models or experimental in vitro studies. The review included all the studies, in which clinical efficacy of denture cleansers were evaluated. There were no restrictions regarding the sex or age of participants. English language peer-reviewed dental literature was electronically searched to identify the relevant scientific article evaluating clinical efficacy of denture cleansers.
PubMed search was carried out by using the “Denture Cleansers” as index word. Filters used included “Clinical Trials” (article type) and “Human studies” (Species) only.

There were no restrictions on the year of article publication so that the search could include all the available articles provided in that particular database. Two independent observers independently read the abstracts and later the preselected full-text articles. For studies meeting the inclusion criteria, articles with full text were obtained and evaluated further. The titles and abstracts of all the screened articles were assessed and reviewed for appropriateness so as to fulfill the purposes of the systematic review. Finally, a further manual search, including the citations of the finally obtained articles, was done to improve the electronic search.

Out of 13 selected studies, 3 studies compared the commercially available Efferdent® tablets with commercially available denture cleansing abrasive paste Dentu-crème® while 1 study evaluated the efficacy of alkaline peroxide based tablets. 4 studies evaluated efficacy of chlorhexidine mouthwashes as denture cleansers and compared it with other agents. Efficacy of bleaching agents such as sodium hypochlorite has been addressed in 2 studies. 2 studies evaluated effect of enzymes on reduction of biofilm formation. 1 study compared two different dentifrices as denture cleansers.

DISCUSSION

Several substances have been used for the purpose of reducing microbial colonization of dentures. Oxidizing agents like alkaline peroxides, sodium perborates are effective in removing stains as well as killing the bacteria harboured on the denture’s surface. Household substances like vinegar, NaCl salt solutions, bleaching agents, detergents etc have also been used for denture cleansing (ShivangiGajwani-Jain et al., 2015; Salles, 2015; Basson et al., 1992). Denture cleansing abrasive pastes with soft brush aids in mechanical cleaning of dentures (Panzeri et al., 2009). Different enzymes like dextranase, mutanase and protease have shown to reduce candida albicans and streptococcus mutans colonizing denture surfaces (Budtz-Jorgensen, 1977; Budtz-Jorgensen, 1977). Most commonly used denture cleansers are based on oxidizing agents like alkaline peroxide, sodium perborate etc (ShivangiGajwani-Jain, 2015). Duyck J et al reported significant reduction of Candida albicans count after overnight storage in alkaline peroxide based tablet solutions (Duyck et al., 2013).

Oxidizing agents have been shown more potent denture cleansers compared to abrasive denture cleansing pastes (McCabe, 1995; Chan, 1991; Dillis, 1998). Chlorhexidine digluconate mouthwashes are comparatively newer agents to be used for denture cleansing. Moffa EB et al reported 2% chlorhexidine digluconate has efficacy similar to sodium perborate based denture cleansers. De Andrade IM et al reported 2% chlorhexidine digluconate to be more potent than 0.12% chlorhexinedigluconate and required less time for denture cleansing (De Andrade et al., 2012). Aoun G et al reported addition of 0.05% cetylpyridinium chloride to 0.12% chlorhexidine digluconate resulted in significant reduction candida labicans colonizing dentures (Aoun, 2015). In a recent study by Sushma R et al reported TriphalaChurna as an antifungal is more efficacious than conventional chlorhexidine digluconate denture cleansers (Sushma, 2017). Reducing agents are also used for reducing the microbial colonization on dentures. Salles MM et al reported 0.5% sodium hypochlorite to be more efficacious in reducing microbial colonization as compared to 0.25% sodium hypochlorite or 8% RicinusCommunis solutions (Salles et al., 2015). Basson NJ et al. reported sodium hypochlorite to be a better cleaner compared to household products such as vinegar (diluted or undiluted) or 20%NaCl salt solutions (Basson et al., 1992). Budtz-Jorgensen first used enzymes like mutanase, dextranase and protease for reducing microbial colonization on dentures. Combinations of the enzymes were found to be more efficacious than pure enzymes (Budtz-Jorgensen, 1977; Budtz-Jorgensen, 1977).
Panzeri H compared 1% chloramine based dentifrice with 0.05% flurosurfactant based dentifrice for denture cleansing and found 1% chloramine based dentifrice to be more efficacious (Panzeri et al., 2009).

**Conclusion**

Denture cleansers correspond to a variety of products designed to safely remove stains, deposits, and debris from the surfaces of dental prostheses, by means of various methods. Effective cleaning of dentures by mechanical or chemical methods will help in reducing mucosal irritation and denture stomatitis. This systematic review demonstrated that oxidizing agents like alkaline peroxide based tablets are the most common product used for denture hygiene. Antimicrobials such as chlorhexidine have shown similar efficacy. Although the available data on denture cleansers are limited, the combination of mechanical and chemical cleansing is considered most appropriate choice in terms of denture cleansing.

**REFERENCES**


