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Bacterial Load in Denture Stomatitis

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Abstract:

Purpose: Dentures may act as a reservoir for most of the pathogens and ulcers caused due to dentures harbour the same number of bacterial colonies. The main aim of this study is to assess the bacterial load in denture patients with denture stomatitis. Though *Candida* albicans is the predominant pathogen in denture stomatitis, other species may be present which are equally pathogenic.

Materials and method: Samples where collected from 10 denture stomatitis patients in those using removable prosthetic appliances using sterile swabs. These were then cultured in suitable media to check for bacterial growth of pathogenic or non-pathogenic bacteria.Standard culture medias were used and the confirmatory tests were done with blood agar media.

Results and conclusion: The predominant bacteria seen in such patients are *coagulase negative staphylococcus* and *alpha-haemolytic streptococcus.* Some species of *enterococcus* and *micrococci* were also found. Although other bacterial species may be present in these patients. Thus, this research is done to count the bacteria colonising in long term removable denture patients.

Keywords: bacterial load, denture stomatitis, removable partial denture, pathogenic, non-pathogenic bacteria

INTRODUCTION:

Dentures are prosthetic devices that help in replicating the natural healthy oral cavity in adult patients and restores the normal functioning of teeth. These prostheses also help the patient to speak and builds self confidence. Although not all prosthesis are successful. There are several reasons to the failure of these prosthetic devices. One of them being denture stomatitis. Denture stomatitis is an infection of oral mucosa predominantly caused by fungus and by some bacterial species in the area covered by dentures. Ulcers occur in most of the newly fitted removable prosthesis which may also be due to improper fitting due to resorption of alveolar bone or overextension of the flanges which cause mucosal irritation leading to ulcers.(Girard et al., 1996) It usually occurs in the upper jaw due to trauma to oral tissues or improper oral hygiene and may contain desquamated cells with pain and swelling.(Spratt, 2003) These ulcers are infected by the bacteria present in the normal flora of the oral cavity.

Bacteria present in the saliva may also cause ulcer when there is alteration in the salivary pH. Bacterial load in saliva increases due to caries, periodontal diseases and also other endocrine disorders like hypo-function of salivary glands which leads to decreased secretion and increased oral bacteria. Change in oral microbiota due to oral diseases may be caused by the alterations in the level of secretory immunoglobinA.(Harold marcott, 1998)They also increase cholesterol levels, risk of cardiovascular disease and inflammation.

Most ulcers tend to have bacterial growth which might sometimes be the normal flora but in an increased number. Normal flora is not harmful unless the count exceeds the normal and permissible levels. Certain bacteria may be pathogenic and may have adverse effects which is of greater concern. The most common organism present in these cases is *Candida*(Lamfon et al., 2005 and Dorko et al., 2001) however other bacterial species are also present (Koopmans et al., 1988; Spratt, 2003 and Lamfon et al., 2005). Increase or alteration in the count of normal flora may also be due to various systemic diseases.(Scannapieco, 1998 and Li et al., 2000)

Increase in bacterial load in denture wearers may lead to ulceration and thereby increase the frequency of transient bacteraemia which may lead to the failure of the prosthesis in the circulatory system. The cause for failure of the prostheses being the colonisation of the bacteria present in these ulcers which cause discomfort and discontinued use of these prosthetic appliances leading to their failure. All these factors act as a precipitating cause for bacterial load in these denture wearers. Thus is study is done to find the bacterial load in denture stomatitis patients.

MATERIALS AND METHOD:

10 patients with denture stomatitis without any systemic disorders and those not under any antibiotics were selected. Samples were taken from the ulcerated mucosa of these patients using a sterile disposable swab in a sterile tube. The bacteria was cultured using Brain-Heart infusion agar and blood agar. The samples were inoculated by streak culture on the culture plates.The plates were then incubated aerobically in an incubator for 24 hrs at 37 degree celsius.Cultured bacteria was isolated and a smear was made. The smear was stained by gram staining and the isolated organisms were identified by standard identification tests.

RESULTS:

In the present study, the cause for the presence of microorganisms was the continuous irritation caused by the denture. Among the ten patients, the predominant bacterial species present was *alpha-haemolyticstreptococcus*followed by Coagulase negative *staphylococcus.* Certain patient sample had enterococcus and rarely micrococci present. However, there was significant rise in the number of the bacteria which constitute the normal flora. This rise in number of bacteria

is of greater concern in these stomatitis patients.the following were the findings of this study:

Sample1- *Alpha-haemolytic Streptococcus* and*Coagulase negative Staphylococcus*
Sample2- *Coagulase negative Staphylococcus*
Sample3- *Alpha-haemolytic Streptococcus and Enterococcus*
Sample4- *Alpha-haemolytic Streptococcus* and*Coagulase negative Staphylococcus*
Sample5- *Coagulase negative Staphylococcus and Micrococci*
Sample6- *Alpha-haemolytic Streptococcus*
Sample7- *Alpha-haemolytic Streptococcus* and*Coagulase negative Staphylococcus*
Sample8 -*Alpha-haemolytic Streptococcus, Coagulase negative Staphylococcus* and *Enterococcus*
Sample9- *Coagulase negative Staphylococcus*
Sample10- *Alpha-haemolytic Streptococcus* and*Coagulase negative Staphylococcus*

SUMMARY:

Ulcers in the stomatitis patient is due to trauma to the oral tissues. From the above study it is clear that the ulceration in the above cases is not due to obligate pathogens but is due to increase in the number of commensals in the oral cavity. The increase in the number of commensals in the oral cavity causes a wide range of microorganisms to be considered while treating denture patients. Healing occurs only when the mouth and dentures is continuously disinfected and the causes for ulcer is eliminated.

CONCLUSION:

The bacteria isolated from these patients are not virulent stainsor exogenousbut are the normal flora of the oral cavity. Stomatitis can be prevented by minimising the risk factors of ulcers. Prevention of ulcers include correcting the height of the dentures due to resorption of bone, reducing the trauma caused to the oral tissues or reduction of flange which causes irritation. Healing of these ulcers and prevention of their recurrence is done by providing the patients with new dentures and maintaining proper oral hygiene.

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