Changes in oral microflora in prosthetic patients on hygiene protocol

Joana Carvalho[1], Teresa Nascimento[2], Luís Proença[3] and Sérgio Félix[3]

[1] DDS, assistant of Oral Rehabilitation, Integrated Master's Degree in Dentistry – ISCSEM, Quinta da Granja, Monte de Caparica - Portugal
[2] PharmaD, assistant of microbiology Integrated Master's Degree in Dentistry – ISCSEM, Quinta da Granja, Monte de Caparica - Portugal
[3] DDS PhD associated Prof., Integrated Master's Degree in Dentistry – ISCSEM, Quinta da Granja, Monte de Caparica - Portugal

Introduction: The relationship between denture hygiene and oral health is clear and, consequently, overall health and quality of life [1]. The prosthesis is responsible for the creation of an environment that promotes the location and development of potentially pathogenic microorganisms [2], therefore to maintain a healthy mucous, it is essential to control the microbial plaque of the prosthesis through a proper technique [3].

Objectives:

1) To evaluate and compare the prevalence, degree of colonization and distribution of microbial species in the palatal mucous before and after the change of hygiene habits for a period of 15 days in individuals with mucous-supported dentures.

2) To evaluate the prevalence, degree of colonization and distribution of microbial species in the palatal mucous of individuals not using the above-mentioned prosthesis, in order to compare both groups.

Material and Method:

120 individuals, of both genders, 60 of which were mucous-supported denture wearers and 60 non wearers of this type of prosthesis, were observed and a smear of palatal mucous was made with sterile swabs (figure 1).

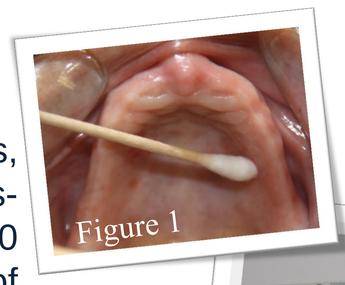


Figure 1

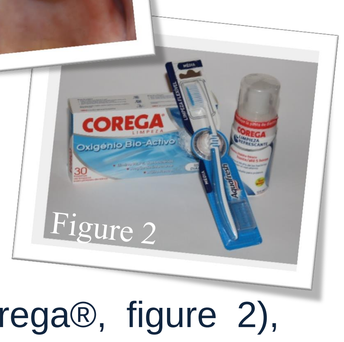


Figure 2

A hygiene kit (denture brush Aquafresh®, antibacterial foam and cleaning tablets Corega®, figure 2), along with a protocol (figure 3) was exclusively given to the group of individuals mucous-supported denture wearers, which they had to use for 15 days, between the two appointments, as illustrated in figure 4.

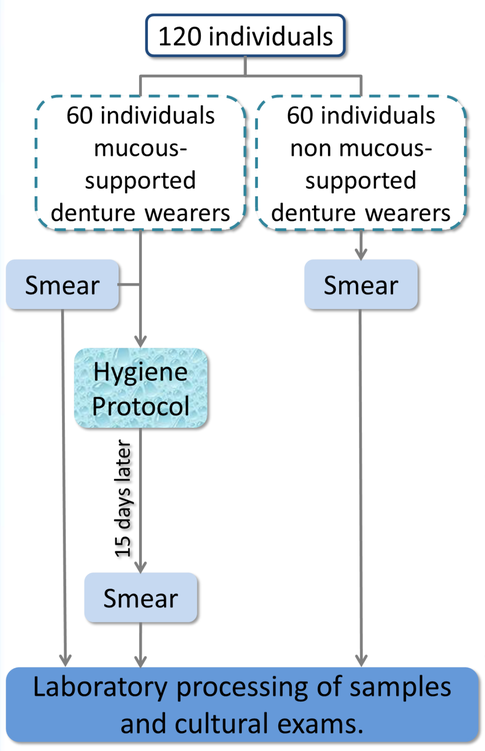


Figure 4

The laboratory processing of samples (figure 5) was based on direct microscopic examination of smears stained by the Gram staining technique and identification of microbial flora through the inoculation of the culture media, Columbia Blood Agar, Mitis-Salivarius-Agar, Drigalsky, Chapman, for bacteria isolation and Candida medium for yeast isolation. The inoculated plates were incubated in aerobic atmosphere at a temperature of 37^{0}C for 24 to 72 hours and the proper identification testes were made according to their morphology, pigment formation, catalase, oxidase, coagulase tests and API identification system.

The results were analyzed by applying descriptive and inferential statistics procedures (Chi-square, Fisher and McNemar tests).

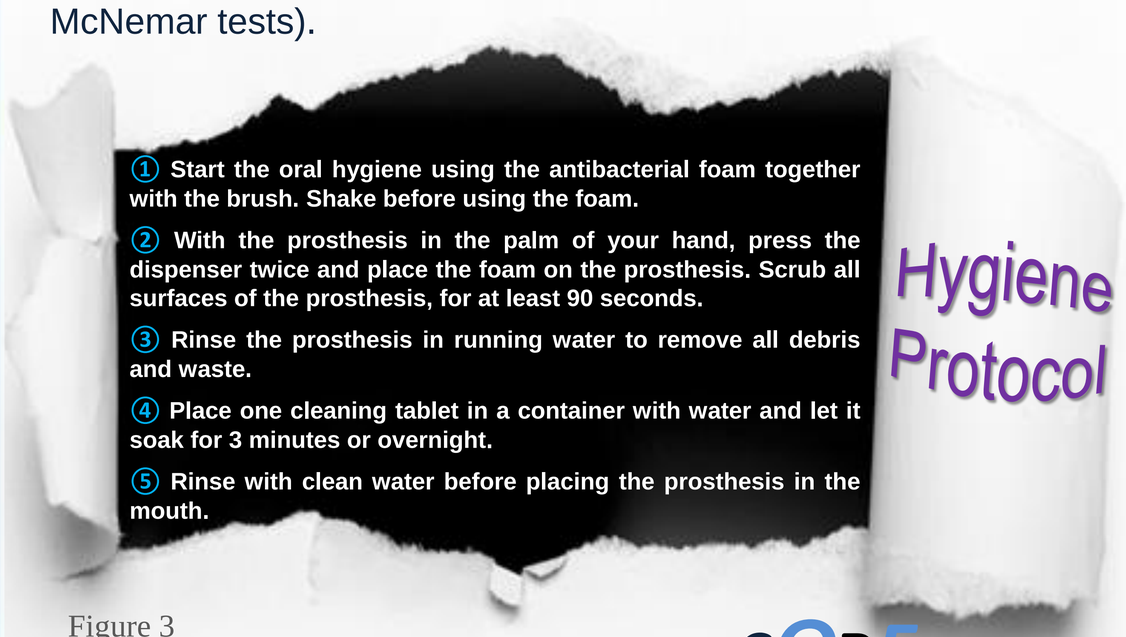


Figure 3

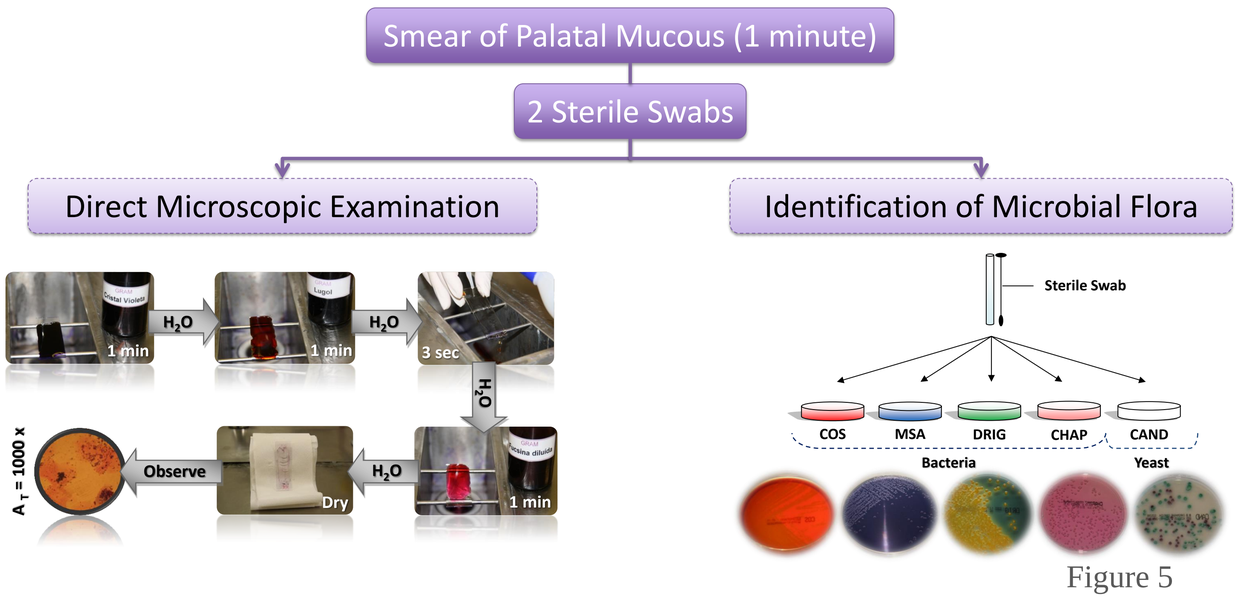
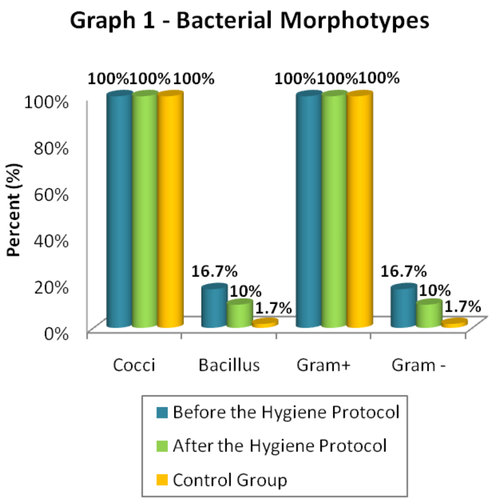


Figure 5

Results and Discussion:

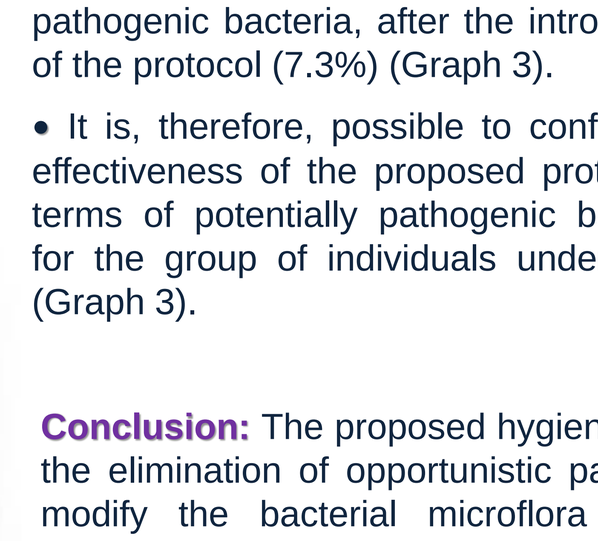
Bacterial Morphotypes

- Gram-positive cocci were found in all patients of the three groups (100%), therefore the protocol did not have any effect in this type of morphology (Graph 1).
- There was a reduction (6.7%) of the morphology Gram-negative bacillus after the introduction of the protocol (Graph 1).



Microorganisms

- Streptococci were found in all subjects (100%), with no changes resulting from the cleaning protocol (Graph 2).



- The prevalence of staphylococci and enterobacteria is similar, before and after the introduction of the protocol, respectively. However, there have been changes in the flora of these colonized individuals and in the pathogenicity of the colonizers microorganisms (Graph 2).
- The absolute effectiveness of the protocol was observed in the group of Pseudomonas, since all individuals are no longer colonized by these species (Graph 2).
- Colonization by yeast was reduced by 18.3% (Graph 2).

Anti-Bacterial Effect

- There was a reduction in the number of pathogenic bacteria, after the introduction of the protocol (7.3%) (Graph 3).
- It is, therefore, possible to confirm the effectiveness of the proposed protocol in terms of potentially pathogenic bacteria, for the group of individuals under study (Graph 3).

Conclusion: The proposed hygiene protocol wasn't 100% effective in the elimination of opportunistic pathogens. However, it was able to modify the bacterial microflora (p=0.031) and the yeast flora (p=0.039) since there was a reduction in the prevalence of the potential pathogenic microorganisms. This may bring benefits to patients mucous-supported denture wearers.

References:

[1] Coulthwaite, L. e Verran, J. (2009) "Evaluation of in vivo denture plaque assessment methods", British Dental Journal, 207(6), pp. 282-283.
[2] Pusateri, C. R.; Monaco, E. A. e Edgerton, M. (2009) "Sensitivity of Candida albicans Biofilm Cells Grown on Denture Acrylic to Antifungal Proteins and Chlorhexidine", Arch Oral Biol, 54(6), pp. 588-594.
[3] Buergers, R.; Rosentritt, M.; Schneider-Brachert, W.; Behr, M.; Handel, G. e Handel, S. (2008) "Efficacy of denture disinfection methods in controlling Candida albicans colonization in vitro", Acta Odontologica Scandinavia, 66, pp. 174-180.