Effect of Denture Disinfectants on Flexural Strength of Different Denture Base Materials

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INTRODUCTION

Denture base is defined as that part of denture that rests on the foundation tissue & to which teeth are attached. There are many types of denture base material, as heat cured resin was introduced in 1937 by Dr Walter Wright and continues to be the material of choice for fabricating many denture prostheses because of its superior esthetics, ease of processing and repair, accurate fit and could be used with inexpensive equipment, Despite many advantages, polymethyl methacrylate has very poor mechanical resistance (e.g.flexural strength) ,midline fracture of maixllary and mandibular denture are the most common and could not be used on patient has monomer allergy or patient has with bilateral inoperable undercuts when pre-prosthetic surgery is contraindicated.

Flexible dentures base Initially developed as a fluoro-polymer & acetal , nowadays is nylon based plastic (Polyamide) unbreakable .It can be built quite thin, it is extremely stable and retentive, It has superior esthetics and non allergic.

The biggest disadvantage that patients face is that a flexible denture is not repairable. There is no addition that can be made to it, If it breaks or becomes loose then a new one has to be made.

Permanent soft liners provide comfort and relief for individuals with receded and flattened foundation that don't respond well to the stress of dentures.

They may also be a suitable solution for patients with chronically sore spots due to sharp bony areas.
Dentures are a favorable environment for bacterial and fungal pathogens, Dentures could be disinfected via different methods, including soaking in chemical solutions, brushing mechanically with a toothpaste, or using microwave radiation ,also some patients use mouth wash as denture disinfectant.

Despite their beneficial antimicrobial effect, some types of chemical disinfectants have been shown to deteriorate the mechanical properties of polymer-based materials.

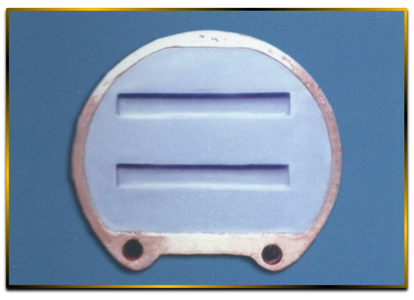
Aim of the work:
To evaluate effect of different disinfectant materials on flexural strength of different denture base materials.

METHODS & MATERIAL

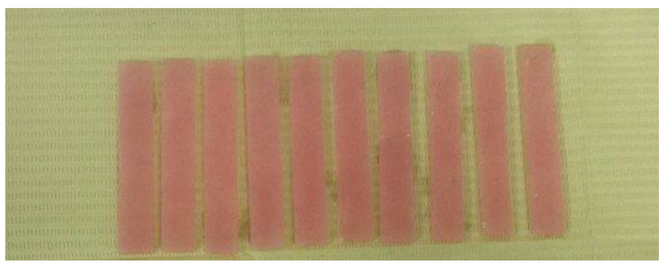
Specimens Preparation
Rectangular shaped, wax patterns were constructed with dimensions of Specimens (60x10x2mm), for the transverse(flexural) strength test
Total no of 90 rectangular shaped Specimens :
30 of each heat-cured acrylic resin denture base material (stone-WhW ENGLAND) 10 as control group and 20 as test group.
30 of each flexible denture base material Vertex™ ThermoSens Vertex-Dental B.V. 10 as control group and 20 as test group.
30 of each permanent soft liner (Vertex™ Soft Vertex-Dental B.V) 10 as control group and 10 as test group.

Immersion procedures:
For control groups distilled water was used as storage liquid.
For test groups Corega Tabs denture cleaning and Listerine mouth wash was used as storage materials.

All groups were immersed in disinfectant solution for 180 days (simulated).
Specimen were immersed for 3 minutes in disinfectant solution and cleaned by running tape water and the process repeated 30 times per day for 6 days.



Stone mold for transverse specimens



specimens after deflasking , finishing and polishing

RESULTS

Flexure strength test :
The flexural strength of a material is its ability to bend before it breaks.
Flexural stress is produced by bending forces.
it is obtained when a load was applied in the middle of a simple beam, which is supported at each end (three-point bending test ,transverse strength) using the universal testing machine at 50mm span length
The applied load increased by even amounts at regular intervals of time then maximum load before fracture was measured
The data were subject to analysis of variance (ANOVA) by using Microsoft Excel 2010 to estimate the p-value ($\alpha < 0.05$)
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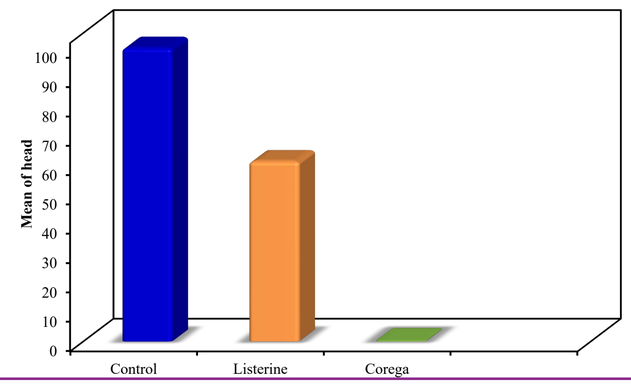
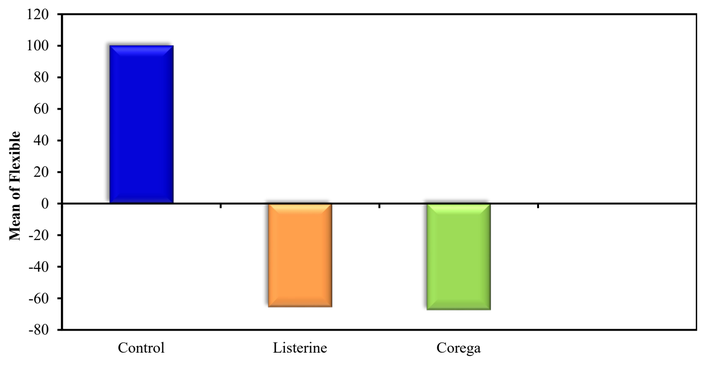
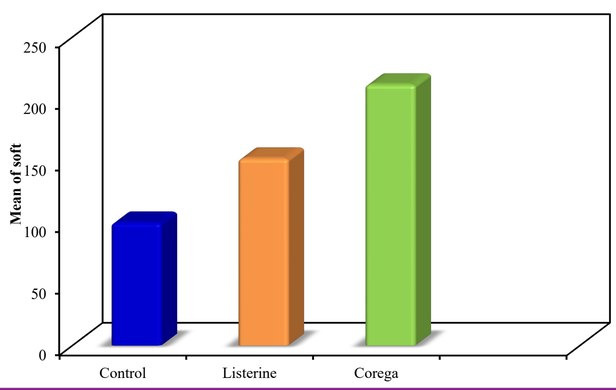
Comparison between Corega, coriander and Listerine according to % of change in Heat cured.



Comparison between Corega, and Listerine according to % of change in Flexible



Comparison between Corega, and Listerine according to % of change in Soft liner



CONCLUSION

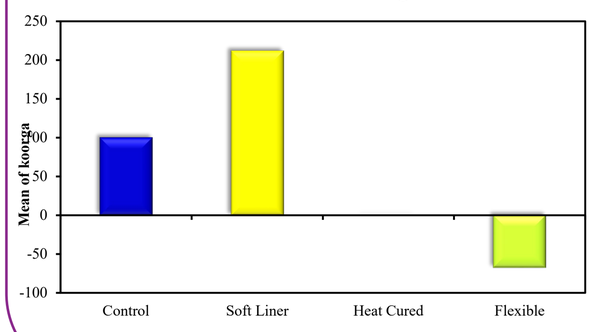
From the results of present study:

Listerine and Corega as denture cleansers and disinfectant had significant increase in flexural strength of soft liner material and had significant decrease in flexural strength of heat cured acrylic resin and flexible denture base material.

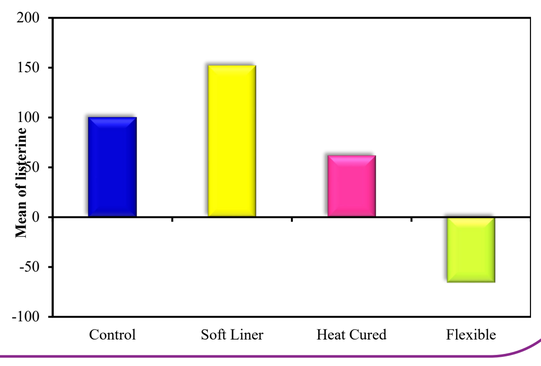
The flexural strength is indicative of the compressive, tensile and shear strengths, which translates as stiffness and resistance of a material to fracture. Therefore increase flexural strength determines the longevity and success of a denture.

It is very important to keep denture hygiene but not all disinfectant material are suitable for dentures so you must choose disinfectant material which has no effect on physical properties of denture base material to increase longevity of dentures .

Comparison between heat cured, flexible and soft Liner according to % change from control in in Corega



Comparison between heat cured, flexible and soft liner according to % change from control in Listerine



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