STORAGE EFFECT ON SHEAR BOND STRENGTH OF FOUR TYPES OF ADHESIVE GENERATIONS.
(IN VITRO STUDY)

A Thesis
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Abstract

This in vitro study was conducted to evaluate the storage effect of distilled water and food simulating solution (75% ethanol solution) on shear bond strength of four types of adhesive generations, 4th generation Scotch bond Multi-Purpose, 5th generation Single bond, 6th generation Self –Etch, and 7th generation Gluma Comfort Bond at three different storage times (one day, one month, and three months).

240 freshly extracted sound mandibular bovine incisors teeth were selected, the roots of the teeth were sectioned and each crown was embedded in acrylic block. The buccal surface of the blocked teeth were grounded to expose a 5 mm^2 area of dentin surface with 600 grit silicon carbide paper after exposing dentin surface. The teeth were randomly divided in to four main groups (60 specimens in each), and the four adhesive generations were applied for each group according to manufacturer instruction.

After that the construction of composite filling (Z 100, shade B2) was applied to the specimens, then each of the four main groups was sub divided in to two sub groups, sub group I (30 specimens) stored in distilled water and sub group II (30 specimens) stored in food simulating solution (75% ethanol solution) at 37 $C^{0,}$ then each subgroup was further subdivided into three groups each of 10 specimens for three storage periods (one day, one month& three months).

After storage the specimens were subjected to shear bonding strength test in an universal testing machine (Instron, England).

The statistical analysis of the results using one- way ANOVA test, Student t-test, at a significant level of a=0.05, revealed that long terms aging of all type of generations both in DW & FSS groups will decrease the shear bond strength value. It has been detected that this reduction for both groups will be material and technique dependant. Aging in food simulating solution (75% ethanol solution) produced reduction of statistically a highly significant difference in shear bond strength values of all type of adhesive generations, to a degree more than of distilled water groups, which in turn produced a highly significant effect of these liquids on shear bond strength with the time in comparison to distilled water groups.

In conclusion storage of all samples in distilled water and 75% ethanol solution produce decrease in SBS values for all generations of adhesive used in this study. Although the FSS will accelerate the degradation of adhesives resin- dentin interface which will cause more reduction of SBS of all adhesive system generations and for all time intervals.

the environmental solvent in oral cavity lies some where between the water and ethanol so it can be assumed that the exposure time of dentin-bonding interface to this environment is of significant important, because this will affected on the durability of the adhesive systems which will be of great importance in vivo effect. In this study it has been found a reduction of 30-50% of the SBS of 75% ethanol solution group in comparison to distilled water group.