

EFFECT OF DISTILLED WATER AND ACIDIC BUFFER ON SOME PROPERTIES OF DIFFERENT COMPOSITE RESIN

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ABSTRACT

The present investigation was done to study the effect of distilled water and acidic buffer on flexural strength, hardness and wear resistance of different composite resins. Microfilled, hybrid and Nanofilled composite resins were selected. It was found that the composite resin with greatest percentage of fillers, showed the highest flexural strength, hardness and wear resistance. The storage in acidic buffer significantly affected the flexural strength and hardness, while the storage in water did not significantly affect the properties tested and there was no significant difference between the tested composite resins with regards to the time of immersion.

INTRODUCTION

A composite is a material composed of a mixture of two or more constituents. Insoluble resin composites have undergone continuous development to improve their adaptability and longevity. Manhart et al. in 2000⁽¹⁾ have encouraged the use of these materials even in stress-bearing area. The filler content, filler size and the distribution of the filler particles influence the physical and mechanical properties of resin composites (Chung, 1990⁽²⁾ and Gladys et al., 1997⁽³⁾).

Hybrid resins offer the dentist improved physical properties but are more difficult to manipulate and have a tendency to be sticky and slump during placement. Hybrids typically have an inorganic filler particle size which does not allow surface

polish that can be retained over time (Vargas and Bouschlicher, 1995⁽⁴⁾).

The micro-hybrid systems offer improvement in a surface polish that can be maintained overtime. Filler particles are most commonly produced by grinding or milling quartz of glass to produce particles ranging in size from 0.1 to 100 μm . Submicron silica particles of colloidal size ($\sim 0.04 \mu\text{m}$), referred to as microfillers, are obtained by a pyrogenic or precipitation process⁽⁵⁾.

In an attempt to develop a dental composite resin that has the mechanical strength of hybrid composite and the superior polish of micro-filled materials, the nano-filled composite resin has been introduced in the market^(6,7).

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