

The Effects of Anti-oxidant Agents as Neutralizers of Bleaching Agents on Dentin Bond Strength

(*In vitro study*)

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Abstract:

During the past years many researchers recognized the reduction in bond strength when bonding was done immediately after intracoronal bleaching procedure. Many attempts tried to minimize or reverse the drop in bonding strength using different methods.

The purpose of this *in vitro* study is to assess the effect of antioxidants (10% sodium ascorbate, 0.1M thiourea and 7% sodium bicarbonate) on reversing bonding strength of composite resin to human bleached dentin and comparing their antioxidants properties in decreasing the drop in bond strength after bleaching. Sixty extracted human upper 1st premolar teeth, extracted for orthodontic purposes were selected, cleaned and sectioned at the level of cervical line, the crowns of the teeth were embedded in acrylic resin blocks exposing the buccal surface only. A flat dentin surface was obtain by cutting 2mm from buccal surface by using wet 600 grit silicon carbide abrasive disks. The samples then randomly divided into 6 groups (10 samples each). Bleaching for the experimental groups was performed using 35% hydrogen peroxide bleaching gel (pola–office).

Group A (Negative control group; dentin samples immediately bonded with composite without bleaching).

Group B (Positive control group; dentin samples bleached and immediately bonded with composite).

Group C (Dentin samples bleached and stored for 14 days in DDW then bonded with composite).

Group D (Dentin samples bleached and treated with 10% sodium ascorbate then immediately bonded with composite).

Group E (Dentin samples bleached and treated with 0.1M thiourea then immediately bonded with composite).

Group F (Dentin samples bleached and treated with 7% sodium bicarbonate then immediately bonded with composite).

Each group was bond with ibond 7th generation adhesives systems (acetone base), standardized cylinders of light cured microfilled-hybrid composite resin (Ice from SDI-Limited) was bond to the dentin surface.

Shear bond strength was determined using Instron testing machine and study the mode of failure by using haematoxylin dye and stereomicroscope X40 the results revealed that:

Bleaching the dentin with 35 % hydrogen peroxide gel for 24 minutes resulted in a highly significant reduction in bond strength of the bleached teeth when bonding was performed immediately after bleaching.

Delayed bonding of composite to the bleached dentin for 14 days will resulted in a highly significant increase in the shear bond strength of the bleached teeth.

Treating the bleached dentin with 10% sodium ascorbate in water base showed a highly significant increase in the shear bond strength of the composite to dentin and reversing the bond strength value to the level of the unbleached dentin.

Treating the bleached dentin with 0.1M thiourea significantly increased the shear bond strength of the composite to dentin.

There is a non-statistical significantly increase in the shear bond strength of the composite to the bleached dentin that are treated with 7% sodium bicarbonate.