

***An Assessment of the Effect of Sodium
Ascorbate Antioxidant on the Bonding
Strength of Composite Resin to the
Bleached Enamel Surface***

(In Vitro Study)

A thesis
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Abstract:

During the past years many researchers recognized the reduction in bond strength when bonding was done immediately after 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 two concentrations of sodium ascorbate (10% and 20%) into two different bases water (WB) and ethanol (EB), on reversing bonding strength of composite resin to human bleached enamel and comparing between their antioxidants properties in decreasing the drop in bond strength after bleaching. One hundred and forty upper 1st premolars teeth, recently 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 exposing the labial enamel surface only. A flat enamel surface was obtained using we 600 grit silicon carbide abrasive disks. The teeth then were randomly divide into 7 groups (20 teeth each). Bleaching for the experimental groups was performed using 38% hydrogen peroxide bleaching gel.

Group A (bleached untreated teeth).

Group B (bleached teeth treated with 10% sodium ascorbate in WB)

Group C (bleached teeth treated with 20% sodium ascorbate in WB).

Group D (bleached teeth treated with 10% sodium ascorbate in EB).

Group E (bleached teeth treated with 20% sodium ascorbate in EB).

Group F (bleached teeth stored for 14 days in DDW before bonding).

Group G (teeth were not bleached acting as a control Group).

Each group was bonded with two adhesives systems (ethanol base and acetone base) .Standardized cylinders of light cured hybrid composite resin were bonded to the grounded enamel surface.

Shear bond strength was determined using Instron testing machine and the results revealed that:

- There was an increase in shear bond strength after treatment of bleached enamel with sodium ascorbate in (WB) .The antioxidant activity was concentration dependent being higher for the 20 % sodium ascorbate.
- Treating the bleached teeth with sodium ascorbate in (EB) failed to increase shear bond strength of the bleached teeth for both adhesive systems.
- Acetone based adhesive increased the shear bond strength value of the bleached untreated teeth.
- Storage of the bleached teeth in DDW for 14 days prior to bonding procedure increased the shear bond strength of the bleached teeth.