

## Vitamin C supplements: *in vitro* erosion potential

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Acidic beverages, foods, and sour candies are erosive to enamel; the erosive properties of vitamin C supplements are unknown. We hypothesize that vitamin C supplements are erosive to enamel.

**Objective:** a) To identify the erosive potentials of vitamin C supplements on enamel and b) To identify how duration of ingestion influences erosive potentials.

**Methods:** Eight supplements including lozenges, chewables, powders, and liquids were purchased over-the-counter. Solid supplements were dissolved in artificial saliva or water at concentrations designed to mimic oral concentrations. Extracted human molars were painted with polish to expose a 1x4 mm smooth surface. Teeth (n=8/supplement) were incubated in solutions at room temperature for 25 hours or times designed to mimic 6 months of exposure. Teeth were sectioned using a microtome, visualized using a polarized light microscope, and lesion depths of eroded surfaces were measured. Statistics included one-way ANOVA with post hoc analyses.

**Results:** Vitamin C supplement solutions were erosive to enamel. Following 25 hours exposure, mean lesion depths produced by Liquid1 ( $311.7 \pm 55.7 \mu\text{m}$ ) were greater than by Chewable1 ( $83.9 \pm 20.7 \mu\text{m}$ ); both were greater than all others ( $<10 \mu\text{m}$ ;  $p < 0.001$ ). After exposures designed to mimic 6 months use, mean lesion depths produced by Powder1 ( $391.17 \pm 57.04 \mu\text{m}$ ) were greater than by Liquid1 ( $42.28 \pm 11.75 \mu\text{m}$ ) and Chewable1 ( $33.38 \pm 3.66 \mu\text{m}$ ); all were greater than the others ( $<10 \mu\text{m}$ ;  $p < 0.0001$ ).

**Conclusion:** Vitamin C is perceived to be safe, protecting against immune deficiencies, cardiovascular disease, and cancers. However, our data suggest that some vitamin C supplements are erosive to enamel. This knowledge will enable clinicians to recommend vitamin C supplements that minimize erosion.