
Fluoride and Argon Laser Treatment Effects on *In Vitro* Enamel Caries Formation in Primary Teeth. G Westerman*, C Flaitz, R Ellis, J Hicks. Creighton U, Omaha NE; Texas Children's Hosp, Baylor Coll Medicine, University of Texas-Houston, Houston TX.

The purpose of this *in vitro* polarized light study was to evaluate topical acidulated phosphate fluoride (APF) and low fluence argon laser (ArTx) treatment effects on artificial caries formation in primary tooth enamel. 20 extracted or exfoliated primary teeth underwent soft tissue debridement and a fluoride-free prophylaxis. Only primary teeth with macroscopically caries-free buccal and lingual surfaces were included. Treatment groups were: 1) Control [n=5]; 2) ArTx [0.231mW, 10s, 11.5J/cm²; n=5], 3) 1.23% APF for 4min before ArTx [n=5]; 4) ArTx before APF [n=5]. Buccal and lingual enamel surfaces were treated, and then rinsed in deionized, distilled water (24h). An acid-resistant coating was applied leaving buccal and lingual sound enamel windows exposed. *In vitro* enamel caries was created (2.2mM calcium, 2.2mM phosphate, 5.0mM fluoride, pH 3.90, 10 days). Following longitudinal sectioning, 50 caries-risk sites (5 sections/tooth; 2 lesions/tooth) per group were evaluated for lesion depth (polarized light, water imbibition) and compared (ANOVA, DMR). Mean lesion depths (\pm sd) were:

Control	Argon Laser (ArTx)	APF Before ArTx	ArTx Before APF
297 \pm 31um*	176 \pm 21um**	140 \pm 23um	124 \pm 17um

(*P<0.05 control vs ArTx, APF/ArTx & ArTx/APF; **P<0.05: ArTx vs APF/ArTx & ArTx/APF)

Argon laser irradiation alone provided a 41% reduction in lesion depth (P<0.05). Combination of argon laser with APF treatments resulted in lesion depth decreases of slightly over 50%. The addition of APF treatment, either before or after argon laser exposure, lessened the caries susceptible (P<0.05) of laser irradiated primary tooth enamel to a cariogenic challenge.

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