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Abstract of the Scientific Literature

Effect of high-fluoride toothpaste and no post-brushing water rinsing on enamel demineralization

The aim of the study was to compare the effects on enamel demineralization and fluoride (F) retention of two different brushing/rinsing regimens. An in-situ caries model with orthodontic bands was used. A test group using a 5000 ppm F toothpaste (n=10) with no post-brushing water rinsing was compared to a control group using a 1450 ppm F toothpaste (n=10) with three daily sessions of post-brushing water rinsing. Orthodontic bands were cemented to the two upper first premolars with a 2-3 mm gap away from the buccal surface in order to provide a tooth surface that could accumulate plaque and provide a potential site for initial caries development. The teeth were extracted at 8 and 9 weeks and analyzed using quantitative laser fluorescence (QLF). Intra-oral fluoride retention was also compared for the two groups by measuring solution samples obtained from under the band using paper points. In comparison to the control group, the test group demonstrated both a significantly smaller QLF lesion area and a smaller average loss of fluorescence. The test group also had the highest F retention concentration under the band.

Comment: *High caries risk groups, such as adolescent patients undergoing orthodontic treatment, should be targeted to use 5000 ppm F toothpastes. Younger patients, for whom high F concentration toothpastes are not recommended, should be discouraged from rinsing their mouths with water immediately after brushing.* **KMM**

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Abstract of the Scientific Literature

Is nitrous oxide effective as a sedative for medical procedures in children?

The goal of this study was to determine the sedative effectiveness of >50% concentrations of nitrous oxide used in medical procedures for children. Patient charts were reviewed retrospectively for all children given procedural sedation using nitrous oxide at the Children's Hospital and Clinics of Minnesota. Nitrous oxide at <50% concentration is regarded as a minimal sedation drug by the ASA (American Society of Anesthesiology) and the AAP (American Academy of Pediatrics), and concentrations ≥50% increase the possibility of moderate-deep sedation and requires continuous monitoring. The most recent ASA and AAP sedation guidelines were referenced in this study. IRB approval for the study was given by the Children's Hospital and Clinics of Minnesota permitting chart reviews of children ≤18 years of age treated using nitrous oxide from September 2006-January 2008 in several departments around the hospital such as emergency, radiology, hematology, oncology, short stay and special diagnostics. Prior to nitrous oxide administration routine pre-assessments were done by a qualified nursing staff, who administered N_2O-O_2 at titrations of 50-60% for 2-3 minutes depending on patient responses. A dental flow meter and scavenger system with a fail-safe cut off valve permitting 0-70% nitrous oxide concentrations with a dental nosepiece and hood were used. The depth of sedation was measured using a validated modification of the Ramsey scale and recorded every 3-5 minutes. The modified scale was the Children's Hospital of Minnesota Sedation Scale with graded sedation scores from 0=general anesthesia to 6 =inadequate sedation. Verbal distraction was used throughout the procedures and 100% oxygen was administered post-operatively. Completeness of the procedure was recorded using the standardized study data of the Pediatric Sedation Research Consortium (PRSA), including documentation of adverse events. Monitoring ranged from nursing observation, pulse oximetry, respiration, heart rate, and blood pressure. Reliable statistical analyses were used to evaluate and compare the recorded data. During the study nitrous oxide data was documented for 2045 procedures minus 187 procedures missing sedation data, leaving 1858 procedures to be analyzed including 59 recorded adverse events. Most of the sedation procedures received a sedation score of 4-drowsy or 5- minimally sedated. There was no difference in the level of sedation for children given a concentration of >50% or ≤50% of nitrous oxide and most children >2 years old could be minimally sedated with >50% concentration of nitrous oxide using the above described system.

Comment: *This study using nitrous oxide in medical procedures supports the continued use of nitrous oxide by pediatric dentists as a dependable behavior guidance tool.* ***JGJ***

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Abstracts of Literature

Impact of caregiver oral health literacy on early childhood oral health

The purpose of this study was to investigate the associations between caregiver oral health literacy and their oral health knowledge and behaviours related to their child's dental health along with their child's oral health status. Oral health literacy is the ability to understand and utilize health information one is given. Data were derived from caregiver-child dyads participating in the Carolina Oral Health Literacy project. All were enrolled in the Women, Infants and Children's Supplemental Nutrition Program (WIC). A total of 1273 pairs were recruited. The Rapid Estimate of Adult Literacy in Dentistry (REALD-30) tool was used to assess oral health literacy of each caregiver which ranges from 0 (lowest literacy) to 30 (highest). Further, caregiver knowledge, behaviors, and infant oral health status were assessed via a questionnaire. The final sample for analysis purposes included 1158 caregiver-child pairs. The mean oral health literacy score was 15.8. Caregivers who reported no daily brushing and those who put their children to bed with bottles had lower oral health literacy scores. Generally low literacy was associated with lower knowledge scores. Regression modeling accounting for race, age, education, and the number of children in the home revealed that low oral health literacy was associated with a greater likelihood for reporting poorer child oral health status and lower caregiver knowledge. American Indians' caregivers appeared to be more likely to report that their child had poorer oral health.

Comment: *Infants, toddlers and preschool children are dependent on caregivers to meet their oral health needs. It is important for dental professionals to ensure that they consider oral health literacy needs of caregivers and parents. Effective and culturally appropriated ways to equip parents with basics in oral health awareness and knowledge are needed. Low oral health literacy may possibly provide some explanation for the high prevalence and severity of Early Childhood Caries (ECC) observed in some ethnic and cultural groups, including American Indian children.* ***RJS***

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Anesthesia induction with sevoflurane causes bradycardia in Down Syndrome children

Halothane and isoflurane have been the basic inhalation agents used with children for years, but sevoflurane is presently the most frequently used inhalation agent used with children. This study had a twofold goal of determining the incidence of bradycardia in Down Syndrome children when sevoflurane was the anesthetic agent and what issues including congenital heart disease are associated with bradycardia. IRB approval for the study was given by the Stokes Research Institute of the Children's Hospital of Philadelphia. The investigators did a computerized search of electronic anesthesia records for procedures done on 209 Down Syndrome patients and 269 healthy control patients from July 1, 1998 to November 15, 2006. Data recorded included age, weight, diagnosis, surgical procedure received, history of congenital heart disease, heart rate, arterial blood pressure, oxyhemoglobin saturation, concentration of expired sevoflurane, and any type of bradycardia from 0-360 seconds post induction. Bradycardia and hypotension were regarded as arterial blood pressure and heart rate below the critical limits requiring activation of the hospital rapid response team. Reliable statistical analyses were used to identify conditions associated with bradycardia, any independent factors and the differences between the test group and the control group. Conditions associated with bradycardia were Down Syndrome, congenital heart disease, low ASA status, and the mean sevoflurane concentration. Independent factors associated with bradycardia were Down Syndrome and low ASA status. Both bradycardia and hypotension were significantly higher in the Down Syndrome group(57%) compared to the control group (12%) for all ages. A positive or negative history of heart disease was not consequential to the high incidence of sevoflurane induced bradycardia in children with Down Syndrome.

Comment: *The occurrence of bradycardia in Down Syndrome patients during anesthesia induction with sevoflurane should not surprise pediatric dentists, and should alert them to be prepared if rescue intervention becomes necessary.* ***JGJ***

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