The Effects of Secondhand Smoke Exposure on Early Childhood Caries

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INTRODUCTION

- Prevalence of dental caries continues to be an important issue in the pediatric population
- Prevalence of cigarette smoking in the adult population, although decreasing in the United States and most other high-income nations, is still a prominent public health issue
- Secondhand smoke (SHS) exposure is associated with many adverse health effects in children
- Current evidence is suggestive but not sufficient to conclude a causal relationship between SHS and dental caries in children

HYPOTHESIS & OBJECTIVES

Hypothesis:

- There is no statistically significant difference in prevalence of cavitated carious lesions or enamel decalcifications between infants exposed to SHS in their homes and those not exposed to SHS their homes.

Objectives:

- To determine whether there is an association between SHS exposure and the presence of early childhood dental caries (cavitated lesions) or decalcifications in the infant population
- To identify patient characteristics associated with cavitated dental caries lesions or decalcifications

MATERIALS & METHODS

- Electronic health records were reviewed for infants aged 6-36 months who were seen in the University of Illinois-Chicago Infant Oral Health Clinic
- Caries experience was measured by tabulating the number of decayed (cavitated) or decalcified tooth surfaces recorded on the patients' odontograms
- Household smoking status was determined by guardian responses to tobacco use questions in the patients' medical history
- The association between household smoking and caries was tested by using bivariate and multiple logistic regression modeling to calculate adjusted odds ratio (OR) estimates and 95% confidence intervals (CI)

Inclusion Criteria:

- Patients must have been seen in the UIC Infant Oral Health Clinic and have a completed Infant Medical History form
- Patients must have been between 6 and 36 months of age at the time of dental visit
- Parents must have answered the questionnaire on secondhand smoke exposure in the household during the child's dental visit

Exclusion Criteria:

- Patients without an Infant Medical History form completed
- Patients under age 6 months or over age 36 months at the time of dental visit
- Parents did not complete the questionnaire on secondhand smoke exposure in the household during the child's dental visit

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RESULTS

- A total of 296 patients met study inclusion criteria
- 180 (61%) had at least one decayed surface and 74 (25%) had at least one decalcified surface
- Forty-six (16%) patients lived in a household with a current smoker
- In multivariable modeling, living in a household with a current smoker was not significantly associated with having a cavitated tooth surface **(OR = 1.18; 95% CI: 0.57, 2.45; p =.66)**
- Infants who lived in a household with a current smoker were significantly more likely than those in smoke-free households to have at least one decalcified tooth surface surface **(OR = 2.81; 95% CI: 1.37, 5.80; p =.005)**
- Infants who lived in a household with a current smoker a higher mean number of decalcified surfaces **(1.70 v. 0.74; *P* = .01).**

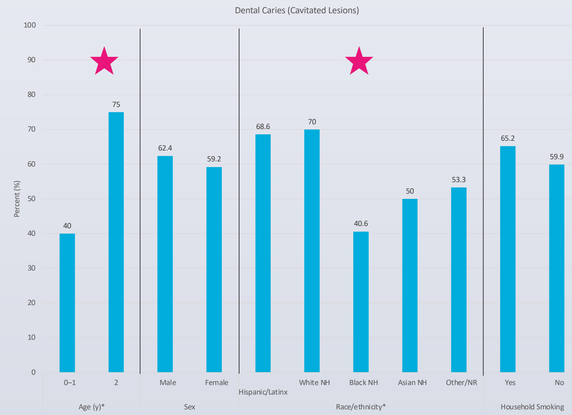

Figure 1: Prevalence of Dental Caries (cavitated lesions) by Select Patient Characteristics

Figure 2: Prevalence of Enamel Decalcifications by Select Patient Characteristics

CONCLUSIONS

- Exposure to secondhand smoke in the household was not associated with an increase in cavitated carious lesions.
- Exposure to secondhand smoke in the household may increase infants' risk for dental decalcifications.
- Future research should control for other potential confounding factors.
- Dental providers should consider inquiring about SHS exposure as part of the routine patient history.

REFERENCES

1) Kazeminia M, Abdi A, Shohaimi S, Jalali R, Vaisi-Raygani A, Salari N, Mohammadi M. Dental caries in primary and permanent teeth in children's worldwide, 1995 to 2019: a systematic review and meta-analysis. Head Face Med. 2020;16(1):22. doi: 10.1186/s13005-020-00237-z. PMID: 33023617; PMCID: PMC7541284.
2) US Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014. PMID: 24455788.
3) Cornelius ME, Wang TW, Jamal A, Loretan CG, Neff LJ. Tobacco product use among adults - United States, 2019. MMWR Morb Mortal Wkly Rep. 2020;69(46):1736-1742. doi: 10.15585/mmwr.mm6946a4. PMID: 33211681; PMCID: PMC7676638.

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