Dental Pain in Maryland School Children

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Abstract

***Objective**: To describe the lifetime prevalence of dental pain among Maryland's school age children. **Methods**: Data come from the Survey of Oral Health Status of Maryland School Children conducted in 2000-01. History of dental pain, as reported by an adult respondent, was analyzed for 2,411 kindergarten and third grade students. Percentages with their 95% confidence interval were calculated to obtain state representation of the distribution of dental pain by sociodemographic characteristics and caries status. **Results**: Overall, 11.8 percent of Maryland school age children in kindergarten and third grade have had some dental pain. Among children who have had caries, the report of dental pain increases to 28.2 percent. Children from families with low educational attainment or eligible for free or reduced meals or covered by Medicaid were more likely to have experienced dental pain. **Conclusion**: Almost a third of Maryland kindergartens and third graders who have caries have experienced dental pain.*

Key Words: dental pain, toothache, children, Maryland, low socioeconomic status.

Introduction

Dental pain in children is a preventable but unfortunate event that can diminish the quality of life and schoolwork of affected individuals. Yet, little is known about dental pain in children in the United States. A Rand Health Insurance Experiment report published in 1987 (1) found that 20% of children 5 to 13 years of age have had a little or some pain on their teeth or gums. Recent data from preschool children attending Head Start centers in Maryland show that 16% of these children have complained of tooth pain and that 8% have cried (2). There is also a paucity of data from other countries on dental pain in children; a study in Harrow, England indicates that 47.5% of children 8 years of age have had some of dental pain (3).

The objective of this report is to present the distribution of parent-reported dental pain among school age children in Maryland. We present the prevalence of dental pain by socioeconomic characteristics for all children and specifically for those who have a history of dental caries.

Methods

Data for this study are from the Survey of Oral Health Status of Maryland School Children (2) conducted during the 2000-2001 school year. The survey's target population was children attending kindergarten or grades 3rd-, 9th-, and 10th in Maryland public schools. Participants were selected according to a two-stage sample design. During the first stage, 50 elementary schools were selected from 5 geographic regions in Maryland according to a probability-proportional-to-size design. During the second stage, two kindergarten and two 3rd-grade classrooms were selected at random from each first-stage school. All students who were present at the selected schools during the scheduled oral examination day and who provided signed informed consent (and assent for children older than 12 years) were eligible for inclusion in the survey. For this study, we limited the sample to kindergarten and 3rd-grade students, because the response rates for high school students were considerably lower and did not provide for reliable population estimates.

The cross-sectional Maryland Survey consisted of an oral examination and a health questionnaire. Data were representative of all but two Maryland counties, which refused to participate because they did not wish to have students miss curricular time. A total of 4,964 kindergarten and 3rd-grade children were eligible for inclusion in the Maryland Survey. Of these, 2,581 received an oral examination (52%) and 3,296 returned a questionnaire (66.4%). Since oral examination and questionnaire data were combined for this analysis, we included only children who had data for both components (2,581). From these, we excluded any child with unknown pain history (n=170), unknown race/ethnicity (n=144), and unknown education level (n=121) data. The final sample was 2,411, representing 110,381 public school children in the State.

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Survey participants were examined by calibrated and licensed dentists, on site, at each of the selected schools. Dentists used mirrors, a periodontal probe with a 0.5mm ball at the tip, portable dental chairs and a standard light source during the oral examination component. The questionnaire was sent home with the children to be filled out by a responsible adult. Study methods and protocols were approved by the Institutional Review Boards at the University of Maryland Dental School and Maryland Department of Health and Mental Hygiene and by the Maryland Department of Education and administrators from each selected school. A report with detailed procedures for the Maryland Survey is available from the authors.

Variables. The dependent variable is the report of ever experiencing pain not related with tooth eruption. Information on previous dental pain was elicited from the parents with the question "Has your child EVER had a toothache BECAUSE OF A CAVITY and NOT because of teething or a new tooth coming in?" To simplify the writing we will refer to "children have dental pain" rather than "children's dental pain because of caries as reported by the parents."

Independent variables were school grade level, gender, self-reported race/ethnicity, parent's or guardian's educational attainment, and eligibility to receive free or reduced meals. Dental utilization variables included: past year dental visit, past year dental cleaning, insurance coverage, and usual sources of medical and dental care. Dental caries status was defined as "caries positive" if there was a history of dental caries in the primary or permanent dentitions, and "caries free" if there was no such history.

Statistical methods. Data were analyzed with percentages and 95% confidence intervals to approximate statistical significance of differences between estimates. Because children with no caries history are not at risk of dental pain because of caries, analyses are presented for all children and for only those with caries history. Analyses were conducted in SUDAAN (4) and included sample weights. To preserve participants' confidentiality, identifiers were deleted as soon as the examination and the survey files were merged. Files including identifiers are kept in a secured computer accessible only to University of Maryland researchers.

Table 1
Weighted population size and weighted percentage among public kindergarten and 3rd grade school children, Maryland, 2000-2001 (n=2,411)

Characteristic	Weighted population size	Weighted percentage
Overall	110,381	100.0
Grade level		
Kindergarten	49,693	45.0
3rd-grade	60,688	55.0
Gender		
Boys	54,810	49.7
Girls	55,571	50.3
Race/ethnicity		
Non-Hispanic white	55,222	50.0
Non-Hispanic black	40,062	36.3
Non-Hispanic other	6,145	5.6
Hispanic	7,072	8.1
Free/reduced meals		
Eligible	38,675	35.0
Ineligible	64,867	58.8
Unknown	6,840	6.2
Education level		
12 years or less	34,655	31.7
Greater than 12 years	74,642	68.3
Has usual source of dental care		
Yes	87,103	80.6
No	20,621	19.4
Has usual source of medical care		
Yes	104,626	95.3
No	5,147	4.7
Dental visit in last year		
Yes	77,309	71.0
No	31,509	29.0
Tooth cleaning in last year		
Yes	73,856	67.7
No	35,286	32.3
Dental insurance status		
Private	64,589	60.0
Medicaid/SCHIP	26,293	24.4
No insurance	16,795	15.6

Source: Survey of the Oral Health Status of Maryland School Children, 2000-2001
Note: Cases with missing data are excluded from analyses of the affected variable only.

Results

Just over half of the children included in this study are in 3rd grade and are evenly distributed by gender. Half of the children are non-Hispanic whites, more than a third (36.3%) are non-Hispanic black and 8.1% are Hispanic (Table 1). A full 35% are eligible for reduced meals and the parents/guardians' educational attainment of 31.7% of the children is high school or less (Table 1). The study sample is generally consistent with the demographics of Maryland (5), however the study sample has a slightly higher proportion of high-SES and Hispanic participants than would have been expected.

Table 2
Weighted prevalence of dental pain (lifetime history), by dental caries history and selected characteristics, Maryland 2000-2001 (n=2,411)

Characteristic	Total		Caries positive (n=821)		Caries-free (n=1590)	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Overall	11.8	9.6-14.0	28.2	23.9-32.5	2.8	1.6-4.0
Grade level						
Kindergarten	7.2	5.0-9.4	21.6	15.9-27.3	2.0	0.8-3.2
3rd-grade	15.5	12.4-18.6	31.7	25.2-38.2	3.7	2.1-5.3
Gender						
Boys	11.0	8.5-13.5	26.6	20.9-32.3	2.0	0.8-3.2
Girls	12.6	9.7-15.5	30.0	23.5-36.5	3.6	2.0-5.2
Race/ethnicity						
NH white	9.6	6.5-12.7	26.1	18.1-34.1	2.4	1.0-3.8
NH black	12.9	10.2-15.6	27.7	23.0-32.4	3.5	1.7-5.3
Hispanic	17.1	7.5-26.7	33.3	16.1-50.5	4.9†	0.0-9.8
Free/reduced meals						
Eligible	17.1	12.8-21.4	31.2	24.5-37.9	5.9	3.4-8.4
Ineligible	8.2	6.2-10.2	24.2	18.9-29.5	†	
Unknown	15.9	8.7-23.2	38.3	24.4-52.2	†	
Education level						
=< 12 years	17.1	12.2-22.0	32.8	23.6-42.0	4.8	2.3-7.3
> 12 years	9.2	7.2-11.2	25.2	19.9-30.5	2.0	1.0-3.0
Has usual source of dental care						
Yes	11.5	9.3-13.7	28.4	24.1-32.7	2.7	1.5-3.9
No	12.5	7.2-17.8	26.7	16.7-36.7	3.0†	0.6-5.4
Has usual source of medical care						
Yes	11.1	9.1-13.1	27.0	22.9-31.1	2.8	1.6-4.0
No	23.7	10.6-36.8	43.3	24.3-62.3	†	
Dental visit						
Yes	11.2	9.0-13.4	29.2	24.3-34.1	2.0	1.2-2.8
No	12.9	9.6-16.2	26.9	20.0-33.8	4.1	1.9-6.3
Tooth cleaning in past year						
Yes	10.3	8.1-12.5	27.5	22.0-33.0	2.1	1.3-2.9
No	13.9	10.4-17.5	28.9	22.2-35.6	†	
Dental insurance						
Private	8.7	6.5-10.8	24.2	18.5-29.9	1.9	1.1-2.7
Medicaid/SCH	15.6	11.5-19.7	29.9	22.5-37.3	4.6	2.1-7.1
No insurance	17.1	10.0-24.2	38.9	27.7-50.1	†	

Source: Survey of the Oral Health Status of Maryland School Children, 2000-2001
†Does not meet the standard for statistical reliability
** Cases with missing data are excluded from analyses of the the variable only.

Table 2 presents lifetime history of dental pain, as reported by an adult respondent, by selected characteristics and caries status. Overall, 11.8 percent of Maryland school children in kindergarten and 3rd grade report that they have had dental pain associated with dental caries and not related to tooth eruption. This percentage increases to 28.2 when the analysis includes only children with caries history. There are not statistically significant differences in the report of dental pain by gender, race/ethnicity, or dental utilization related variables. Children from families with low educational attainment, eligible for reduced meals or covered by Medicaid or who had no insurance are more likely to have experienced dental pain.

Discussion

Nearly 12% of school children in Maryland have had at least one episode of dental pain as reported by a parent or guardian. Furthermore, almost a third of the children who have had a history of dental caries also have had dental pain. Any other preventable pain that affects almost a third of any social group would be considered unacceptable and would be the subject of multiple studies. Unfortunately, dental pain is considered by many a common occurrence and for this reason is less likely to be studied than other less prevalent health conditions (1). Moreover, it is probable that many children learn to live with pain, taking pain as part of their normal lives (6), similar to the perception of dental pain in the earlier centuries.

The low response rate (51.9%) in the examination component is a limitation of this study; however, it has been consistently shown that most population studies have very low response rates. Another limitation is that the relative small sample size precluded us from more detailed analyses and in some cases could have been the reason for the lack of statistical significance of observed and expected trends.

Dental pain in children, as has been found previously in adults (7,8), is distributed by social characteristics. Children living in disadvantaged social conditions as indicated by low parents' education, eligibility for free reduced meals, or lack of private insurance coverage, are more likely to have had dental pain. It is known that low income children, who need dental treatment the most because they have higher prevalence of caries than mid- and high income children, are less likely to have had at least one dental visit in the past year (9). This combination of disease and poor access to care perhaps explains the higher prevalence of dental pain among low-income children.

The fact that almost a third of the Maryland school age children with history of dental caries have had at least one episode of tooth pain indicates that preventive and early dental care are sorely needed by these children. Contributing factors to inadequate dental care such as poverty, access to willing and able dental providers, and inadequate and inefficient funding programs continue to be barriers to prevent tooth pain in children, an unnecessary health problem.

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