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Prevalence of Parental Smoking and Predictors of Cessation: A Study in the South Carolina Pediatric Practice Research Network

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Abstract

Background—Secondhand smoke exposure harms children. The objectives of the study were to determine the prevalence of secondhand smoke exposure in children ≤2 years and determine the predictors of smoking and smoking cessation in parents.

Methods—We surveyed parents of children ≤2 years of age, asking about parental smoking patterns, interest in quitting and children's respiratory symptoms. Data were analyzed with chi-square and multiple logistic regression.

Results—Thirteen percent were current smokers and 18% had quit. The most common reason for quitting was being pregnant (42%). Children's respiratory symptoms did not predict quitting. Parents on Medicaid were more likely to smoke than those on private insurance (OR = 5.7, 95% CI = 2.0–16.5) and less likely to quit (OR = 0.2, 95% CI = 0.1–0.9).

Conclusion—Having a new baby may be a motivator for parents to quit. We must address socioeconomic factors to develop a successful intervention in pediatric practices.

Keywords

smoking; secondhand smoke; environmental tobacco smoke exposure; pediatric; parents; children

Introduction

Tobacco use represents a serious drug addiction to nicotine, and most adults who smoke wish they were able to quit.[1–3] While US adult smoking rates have declined from the 1970s, they appear to have leveled off. Data from the 1990s through the early 2000s demonstrate that 25% to 35% of homes where children live have a smoking adult residing there.[4–6] The primary source of secondhand smoke (SHS) exposure for infants and toddlers are parents and other caregivers.[7] SHS is a well-established pediatric health threat known to cause numerous pediatric health conditions, including otitis media, acute asthma exacerbations, neurobehavioral disorders, and sudden infant death syndrome.[8]

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Declaration of Conflicting Interests

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Parents are concerned about tobacco exposure in their children.[9] Parents report that they would like their pediatrician to ask about and advise against smoking. In one study, up to 89% of parents reported that their child's pediatrician should ask about tobacco exposure.[10] A recent review of the literature demonstrates that pediatricians do not regularly or frequently ask about tobacco exposure and suggest ways that parents can quit.[11] Having a better understanding of how and when children get exposed to SHS and what factors might motivate those parents to quit smoking can help guide interventions for cessation of tobacco use.

The pediatrician's office is a natural setting to discuss smoking cessation with any adults who are caring for children. Because of the frequency of well-child visits in the first 2 years of life, the pediatrician is likely to be the health care provider that parents come into contact with the most and the pediatrician's office may be a natural place to initiate referral to quitting resources. Logistically, it is possible and effective in the pediatric office to provide parents with nicotine replacement therapy or other aids to quit smoking.[12]

The objectives of this study were to (*a*) determine the prevalence of SHS exposure in infants and toddlers in a group of pediatric practices and (*b*) determine the predictors for smoking and smoking cessation in parents of children ≤2 years.

Methods

Setting

This study took place in 8 pediatric practices with diverse populations that are a part of the South Carolina Pediatric Practice Research Network (SCPPRN), a regional research network primarily covering the eastern half of South Carolina. Half of the SCPPRN practices are located in a suburban environment and three are in rural settings. The patient demographic mix in network practices varies considerably. The percentage of patients who are funded by Medicaid insurance ranges from 4% to 90% (mean 53%). Racial and ethnic diversity is also apparent: White, 8% to 93% (mean 42%), Black, 3% to 95% (mean 41%), and Hispanic, 1% to 80% (mean 14%). The range of patient visits per year is 1000 to 98 865.

Survey Development

We developed our data collection instrument based on the need to identify the prevalence of SHS exposure in a population of infants and toddlers. Questions were initially developed by reviewing the literature and by an iterative process that included assessment of question face validity and content validity. We then piloted the survey for clarity and revised questions based on the respondents' feedback. Survey questions included whether the parent (identified as the mother, father, or other primary caregiver who normally and regularly cares for the child) was a smoker or a past smoker. We also asked whether other members in the household smoked so that we could evaluate all household smoking. In addition, we asked whether anyone smoked in the car and whether the parent had any "smoking rules" about where/if smoking was allowed in the home or car. For those who reported smoking, we inquired about interest in quitting. Among those who had already quit or expressed interest in quitting, we explored their reasons for doing so. Finally, we inquired about any

respiratory symptoms in the child including cough (frequent or nighttime), breathing problems, and wheezing.

Data Collection

Each of the 8 practice was asked to distribute and collect 30 surveys from parents of children aged ≤2 years who brought their child in for a well visit in the fall of 2009. In one practice with a large Hispanic population (approximately 50%), we oversampled to obtain 30 surveys in Spanish and 30 surveys in English.

Data Analysis

Surveys received from the practices were entered into a Microsoft Access database by trained research staff. Data were then analyzed in SAS version 9.2 (SAS Institute, Cary, NC). We calculated frequency distributions and conducted bivariate analyses using chi-square. We examined smoking by race, insurance status, and by child's respiratory symptoms. We evaluated relationships between interest in quitting and potential predictive variables among the parents of children with respiratory symptoms. We also used multiple logistic regression to identify predictors of parent smoking and factors that predicted a prior smoking cessation attempt. Using the questions about parent's smoking status and sources of smoke exposure in other places, we created a variable of total smoke exposure, which we compared with child's symptoms using chi-square.

This study was approved by the institutional review board of the Medical University of South Carolina.

Results

Of the 240 surveys distributed, 3 were excluded due to missing data, resulting in a final sample size of 237. Table 1 summarizes the parents' demographic characteristics and children's smoke exposure according to parental smoking status. Overall, 69% of parents reported being a nonsmoker. Eighteen percent said they had quit smoking, and 13% of the parents were current smokers. Among African Americans, 16.9% were current smokers, as compared with 13.7% of whites and 2.8% of Hispanics who were current smokers ($P < .0001$). Of those in the "never smoked" category, whites make up the largest percentage (45%) followed by African Americans (35%). When examining parental smoking status by race/ethnicity, most African Americans (57 of 77, 74%) and nearly all Hispanic parents (32 of 36, 89%) never smoked. A higher number of parents on Medicaid compared with private insurance were current smokers. One of the current smokers reported smoking in the home, and 9 (29% of current smokers) smoked in the car. Child respiratory symptoms and a classification of total smoke exposure are also in Table 1. When including other household contacts, up to 21% of children were exposed to tobacco smoke on a regular basis, as 11 children whose parent denied smoking had another family member living in the home who did smoke.

Of the 31 current smokers, 12 had tried quitting, 19 expressed willingness to quit, and 12 had no intention to quit. Of the 43 parents who quit, the most commonly reported reason for quitting was becoming pregnant or having a new baby in the household (42%).

Bivariate Analyses

A larger percentage of whites reported “ever smoking” (current or former smoking) compared to African Americans (40% vs 26%; $P = .04$). Among those who have ever smoked, whites were more likely to have reported quitting than African Americans (66% vs 35%; $P = .02$). Medicaid recipients were more likely to be smokers than parents with private insurance (18% vs 8%; $P = .04$). Age of the parent was not associated with smoking status ($P > .10$); nor was there an association between smoking status and presence or absence of respiratory symptoms in the child ($P > .60$). Among parents who did smoke, there was no association between interest in quitting and the presence or absence of any respiratory symptoms in the child ($P > .30$).

Multivariate Analyses Predicting Smoking and Likelihood of Quitting

In order to predict who were likely to smoke, we used a logistic regression model that compared current smokers with parents who never smoked (Table 2). Parents on Medicaid were more than 5 times more likely to be a current smoker than non-Medicaid recipients (OR = 5.7, 95% CI = 2.0–16.5). The model did not demonstrate a strong relationship between race/ethnicity and likelihood of smoking except that Hispanics were less likely to smoke than Caucasians. Although African Americans were also less likely to smoke, this was not statistically significant. Parental age was not associated with likelihood of smoking.

We also examined the factors that might predict the likelihood of a parent successfully quitting by comparing current smokers with former smokers (Table 3). Parents whose child was covered by Medicaid insurance were less likely to quit smoking than those covered by private insurance (OR = 0.3, 95% CI = 0.1–0.9). Other parental demographic variables, such as age and race/ethnicity, as well as the presence of a child’s respiratory symptom were not predictive of success in quitting smoking. Parents of children with respiratory symptoms were 1.5 times more likely to quit, but this was not statistically significant.

Discussion

Thirteen percent of children in this study had a parent who was a current smoker. Consistent with national trends that show smoking is becoming more concentrated in groups of lower socioeconomic status,[13] parents of children covered by Medicaid were the most likely group to smoke and the least likely to successfully quit smoking.

Surprisingly, children’s respiratory symptoms were not significantly associated with parental intention to quit. Other studies have also generated equivocal evidence on this topic. A small pilot study of 5 families demonstrated that counseling reduced smoke exposure by 40% to 80% from baseline.[14] Chan et al[15] tested an individualized motivational intervention consisting of an assessment of parental readiness to quit and a 30-minute session to increase motivation to quit, followed by a reminder phone call 1 week later. They reported a quit rate of 7.5% at a 1-month follow-up period compared with a 2.5% quit rate in the control group, but the results were not statistically significant.[15] Another study with a brief educational intervention and parent handouts followed by mailed information at 4 and 8 months concluded that the child’s health status is not sufficient as a stand-alone motivator for

parents to quit smoking.[16] Hovell et al[17] used parental coaching along with asthma management education and reported a reduction in environmental tobacco smoke exposure among childhood asthma patients, though not necessarily an increase in smoking cessation. Smoking cessation aimed at either maternal health or child health effects did not demonstrate an increased quit rate but did show a change in smoking locations, such as outside or a different room.[18]

Becoming pregnant or having a new baby in the household was a major motivation in our study for parents that did quit smoking. Previous data have demonstrated this finding, particularly for those in higher socioeconomic classes.[19,20] Unfortunately, the rate of relapse can be high without treatment and support.[21,22] Our findings suggest that the population of smoking mothers with newborns or toddlers may be receptive to interventions introduced in the pediatric setting aimed at supporting new mothers' desire to quit smoking and protect their children.

Given the quit rate associated with pregnancy and subsequent delivery of a newborn, as well as past research supporting the role of the child health care provider, the pediatrician's office may be the ideal setting to establish a smoking cessation program. If all recommended well-child visits are kept, parents will visit the pediatrician at least 9 to 10 times during their child's first 2 years of life, not counting any visits for an acute illness.[23–26] Policy set forth by the American Academy of Pediatrics recommends that the pediatrician ask about tobacco exposure and parental smoking and advise parents not to use tobacco products in the home and the car.[7] Assisting parents to quit smoking is beneficial for the child's immediate health as an infant and toddler. In addition, since children raised in a home with smoke exposure are also more likely to become smokers themselves, then interventions to promote smoking cessation in parents may help prevent this troublesome cycle. If pediatricians can intervene in the outpatient setting to help parents stop smoking, it will decrease the risk of future smoking among children.[27] In one national survey, pediatricians do not regularly refer parents to the Quitline, even though parents report being receptive to this approach.[28]

Medicaid recipients in our survey were more likely to smoke and to show no interest in quitting. Preventing smoking initiation among young children in Medicaid population will also be important, given the difficulty that Medicaid recipients currently have in trying to quit. One study aimed at low income women used a motivational message from the child's clinician, motivational interviewing from the practice nurse, and outreach telephone calls reported a modest improvement in abstinence rates.[9]

This study may be limited by the sample size, particularly in the numbers who had admitted to smoking. As this is a convenience sample, it does not necessarily represent the distribution within each practice of all age groups and may be subject to response bias. However, we believe these findings are hypothesis generating, particularly in identifying smoking cessation goals of new parents. The practices participating in the study have a wide range of socioeconomic variability in their patient populations; however, due to the regional nature of the network, the data may not necessarily reflect the population of other regions in the United States.

Conclusions

In this sample, 31% of parents of 1- and 2-year-olds were current or former smokers. Becoming pregnant or having a new baby in the house was reported to be a major motivation for 42% the parents who quit smoking. Parents of children who are covered by Medicaid are more likely smoke and less likely to quit than parents with private insurance. The pediatrician's office may be an effective place to introduce an intervention to stop smoking in order to capitalize on the intentions of new parents.

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Table 1

Distribution of Parent Demographic Characteristics, Smoking Exposure, and Frequency of Children's Respiratory Symptoms by Parental Smoking Status

All (N = 237)	Never Smoked (N = 163); n (%)[a]	Quit Smoking (N = 43; n (%)[a]	Currently Smoking (N = 31); n (%)[a]
Age, years			
15–24 (n = 63)	51 (31.2)	5 (11.6)	7 (22.6)
25–29 (n = 62)	39 (23.9)	15 (34.9)	8 (25.8)
30+ (n = 111)	72 (44.2)	23 (54.5)	16 (51.6)
Race/ethnicity			
African American (n = 77)	57 (35.0)	7 (16.3)	13 (41.9)
Caucasian (n = 124)	74 (45.4)	33 (76.7)	17 (54.9)
Other (Hispanic) (n = 36)	32 (19.6)	3 (7.0)	1 (3.2)
Insurance			
Medicaid (n = 131)	89 (54.6)	19 (44.2)	23 (74.2)
Private/self (n = 106)	74 (45.4)	24 (55.8)	8 (25.8)
Smoking exposure			
Severe (n = 26)	11 (7.0)	6 (14.6)	9 (29.0)
Moderate (n = 22)	0	0	22 (71.0)
Mild (n = 62)	49 (30.1)	13 (30.2)	0
None (n = 127)	103 (63.2)	24 (55.8)	0
Child respiratory symptoms			
Yes (n = 73)	53 (32.5)	12 (27.9)	8 (25.8)
No (n = 164)	110 (67.5)	31 (72.1)	23 (74.2)

[a]Percentages shown are column percentage.

Table 2

Predictors of Being a Smoking Parent (Compared With Parents Who Never Smoke) in Households of 1- to 2-Year-Old Children.

	Odds Ratio[a]	95% Confidence Limits	*P*
Age, years			
<25	0.6	0.2–1.9	.4
25–29	Reference		
≥30	1.5	0.5–4.2	.4
Race/ethnicity			
White	Reference		
African American	0.5	0.2–1.4	.2
Other	0.07	0.01–0.6	.01
Insurance status			
Medicaid	5.7	2.0–16.5	.001
Non-Medicaid	Reference		

[a] Logistic regression.

Table 3

Factors That Predict Smoking Cessation (Compared With Current Smokers) in Parents of 1- to 2-Year-Old Children.

	Odds Ratio[a]	95% Confidence Limits	*P*
Child respiratory symptoms[b]	1.5	0.5–4.9	.5
Age			
<25	0.5	0.1–2.5	.4
25–29	Reference		
≥30	0.6	0.2–1.9	.4
Race/ethnicity			
White	Reference		
African American	0.5	0.1–1.6	.2
Other	3.9	0.3–47.7	.3
Insurance status			
Medicaid	0.3	0.1–0.9	.03
Non-Medicaid	Reference		

[a] Logistic regression.

[b] Frequent or nighttime cough, wheeze, “breathing problems.”