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RELATIONSHIP BETWEEN CHILD ABUSE AND ADULT SMOKING*

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Abstract

Objective—A strong association between a history of child abuse and subsequent psychiatric disorders including substance use has been demonstrated. However, few studies have examined the relationship between child abuse and cigarette smoking in individuals without co-occurring psychiatric disorders. In this study, the relationship between severe childhood abuse and smoking were examined in a group of adults without significant psychopathology.

Methods—Participants ($N = 57$) represent the control group of a larger study of substance dependence. Participants were without major DSM-IV psychopathology, including substance use disorders, major depression, or posttraumatic stress disorder. The Early Trauma Inventory [20] assessed history of exposure to traumatic events prior to age 18.

Results—The majority of individuals with, as compared to without, a history of severe child abuse (79% vs. 47%, $p = .02$) were current cigarette smokers. The odds of smoking was four times as high in participants with versus without a severe childhood abuse history ($OR = 4.0$, $p = 0.04$).

Conclusions—Although preliminary, the findings demonstrate a strong link between early childhood trauma and later adult cigarette smoking among individuals without significant substance use or other psychopathology.

Keywords

nicotine; child abuse; early adversity; cigarette smoking; sexual abuse; physical abuse

INTRODUCTION

Cigarette smoking is a particularly common addictive behavior, and a leading cause of mortality and morbidity [1]. The current prevalence of cigarette smoking in the United States is 23.9% among men and 18.0% among women [2]. Child abuse and neglect are known to be associated with significantly higher rates of psychiatric morbidity (e.g., substance use disorders, anxiety, and affective disorders) in adults [3-7] but are not typically thought of as risk factors for the onset of cigarette smoking. However, it is well established that smoking onset typically occurs in adolescence [8], initiation is generally complete by

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the late teen years [9], and that nicotine dependence rates increase rapidly throughout adolescence and stabilize around age 18 [10,11].

While most people who smoke cigarettes begin during adolescence [8], precipitating factors are not clear. One study found that adolescents with ADHD started smoking at an earlier age than adolescents without ADHD [12], and another demonstrated that the risk of smoking is doubled in female adolescents who exhibit externalizing behaviors and depressive symptoms compared to females scoring low on depressive and externalizing dimensions [13]. Smoking behavior and higher depressive and trait anxiety scores in young adult males [14] have been found to be significant predictors of daily or experimental smoking, especially in settings where peers are also smoking [15].

While mood and anxiety disorders and other types of substance use have typically been proposed as mediators in the development of smoking among adults [16-18], early physical and sexual abuse have been shown to be predictors of cigarette smoking as well. For example, a large recent study ($N = 68,505$) of women's health found a graded association between frequency and severity of physical and sexual abuse and smoking [6]. Women with a history of childhood abuse were twice as likely to smoke by age 14 than those without this history and smoking status by late adolescence was even more likely to be associated with adolescent physical or sexual abuse than childhood abuse. In addition, researchers found that high emotional familial support reduced the impact of abuse on smoking status by 40% [6]. The findings of these studies underscore the potential importance of childhood physical or sexual abuse as factors precipitating the onset of cigarette smoking or nicotine dependence.

Few studies have examined cigarette smoking among adults with a history of childhood abuse and no major DSM-IV psychopathology. The current study aimed to address this gap in the literature by preliminarily examining the impact of a history of child abuse on current cigarette smoking among healthy individuals without severe psychopathology.

METHOD

Participants were 57 individuals (26 men, 31 women) with an average age of 36.6 years ($SD = 12.3$) who were recruited as the control group of a larger study examining hypothalamic pituitary adrenal (HPA) axis functioning and cocaine dependence. Participants were recruited via newspaper and other media advertisements. Individuals were screened via telephone and, if eligible, an office visit was scheduled during which they signed an IRB-approved consent form and completed a clinical interview and history and physical examination. Demographic characteristics were assessed, and current smoking status was determined by direct interview. Participants were classified as smokers if they responded "yes" to the question "Do you smoke cigarettes." Current psychiatric diagnoses were assessed using the Structured Clinical Interview for DSM-IV [19]. Individuals with substance use disorders (except nicotine or caffeine dependence) and other psychiatric conditions that could affect HPA axis functioning (e.g., major depressive disorder, bipolar affective disorder, PTSD) were excluded. Because endocrine measures of the HPA axis were of interest to the parent study, individuals who were pregnant, obese, or had a major medical disorder (e.g., diabetes, AIDS) were excluded because those conditions could affect the HPA axis. Subjects were compensated for their time.

As part of the baseline assessment, a series of self-report measures were completed. The Early Trauma Inventory (ETI) [20], a 56-item self-report form which assesses early life (i.e., before the age of 18) physical, sexual, and emotional abuse was administered to all participants. In order to examine the impact of severe early life trauma, six clinicians (three MDs, three PhDs) rated the ETI items as "severe" or "not severe" and a composite indicator

variable was created. For the purposes of this study, items rated as “severe” by all six clinicians were considered severe early life trauma items, and included: witnessing a murder; being a prisoner of war or held hostage; combat exposure; victim of physical assault; being tied up or locked in a closet; victim of rape; and forced genital, oral, or anal intercourse. Rape and forced genital, oral, and anal intercourse were assessed with the following questions on the ETI: “Were you ever the victim of rape?” “Did anyone ever have genital sex with you against your will?” “Were you ever forced or coerced to perform oral sex on someone against your will?” “Did anyone ever perform oral sex on you against your will?” and “Did anyone ever have anal sex with you against your will?”

Statistical Analyses

Demographic variables were compared across smoking status using Chi-square (χ^2) or Fisher’s exact tests (for small expected cell counts) for categorical variables and the two-sample *t*-test for continuous variables. Because significant gender differences in rates of child abuse and other early life trauma have been documented in the literature [21], gender was also included as a covariate. Contingency table and logistic regression analyses were used to examine the odds of nicotine use among participants with versus without a history of severe childhood abuse.

RESULTS

Demographic Information

Table 1 presents the demographic characteristics of the sample. Half of the participants were Caucasian (54%); the majority had some college education (86%) and were employed (73%). Approximately 58% of participants were current cigarette smokers. Non-smokers were more likely than smokers to have some college education ($p = 0.02$), and women had higher rates of employment than men ($p = 0.04$). No other significant differences in demographic characteristics were revealed. Approximately 28% of subjects experienced a severe general trauma (assault, witnessed murder, prisoner of war, combat), 7% experienced a severe physical trauma (tied up, held hostage), and 11% experienced a severe sexual trauma (rape or forced genital/oral/anal sex).

Among individuals with a history of childhood physical or sexual abuse, the large majority (79%) were current smokers, as compared to 47% of individuals without a history of early life trauma ($\chi^2(1) = 5.18, p = 0.02$). The odds ratio for smoking was 4.0 (95% CI: 1.1, 14.7; $p = 0.04$) after adjustment for gender. Thus, the odds of smoking were approximately four times as high in individuals with severe early life trauma as compared to those without.

DISCUSSION

The current findings are unique in that they report on the relationship between a history of child abuse and cigarette smoking among adults without significant psychopathology. For subjects with a history of severe early life trauma (e.g., sexual assault, witnessing a murder), the odds of smoking were four times more than for subjects without such a history.

Several studies have independently examined the association of cigarette smoking and early trauma, though few have examined individuals without psychopathology. In one study, anonymous surveys from approximately 300 women, aged 18 to 74 years, recruited from a college campus found that a history of childhood sexual abuse ranging from sexual touch to rape was a strong predictor of cigarette smoking [22]. Those who were abuse survivors were 3.8 times more likely than their non-abuse counterparts to smoke cigarettes. Although the researchers did find a sexual abuse history to be a better predictor of smoking status than variables such as income, age, and ethnicity, there was no report of the presence or absence

of psychopathology. In addition, age of trauma was found to influence smoking onset; participants with versus without early life trauma were 2.1 times more likely to begin smoking cigarettes before the age of 14 [22]. This is similar to findings in a prospective longitudinal Australian birth cohort study ($N = 7223$) that found adults who experienced childhood sexual abuse before age 16 were at greater risk for nicotine abuse or dependence by age 21, and that individuals who experienced penetrative sexual abuse (more severe abuse) were at an even greater risk of being nicotine dependent. For any type of sexual abuse—including non-penetrative, penetrative, and self-reported rape before age 16—higher rates of nicotine use were reported than in individuals without a history of sexual abuse. Neither study commented on rates of physical abuse or comorbidity in their cohort. The authors speculated that traumatized individuals begin to use substances as a means to cope with stress and relieve pain related to memories of abuse [23].

This theory is further supported by one retrospective study that found an elevated risk of cigarette smoking, but no elevated risk of other substance use after exposure to traumatic events, regardless of PTSD status [24]. Although the authors concluded that individuals exposed to early life trauma who do not develop PTSD are not at increased risk for the development of major depression and substance use disorders, the data support the idea that trauma alone is a causal risk factor in the etiology of cigarette smoking. Their findings are consistent with the findings of the current study in suggesting that trauma may play an important role in the development of cigarette smoking and nicotine use disorders.

Despite the strong associations between smoking and anxiety, there has been relatively little systematic investigation of their causal connections. In general, it has been hypothesized that the link between abuse and nicotine dependence is mediated by mood and anxiety disorders. A recent review suggests that smoking, and nicotine in particular, can alleviate anxiety; however, other studies indicate that nicotine use and withdrawal can increase anxiety [25]. The Development and Assessment of Nicotine Dependence in Youth (DANDY) study followed a cohort ($N = 679$) of seventh graders for 3.5 years and found a strong relationship between trait anxiety and all measures of tobacco use and nicotine dependence [26]. The findings from that study, as well as those from other researchers, suggest that trait anxiety that does not meet the threshold for DSM-IV disorder criteria may play a role in the initiation and maintenance of cigarette smoking in individuals exposed to early life trauma.

Identifying the period of risk for onset of cigarette use and understanding the nature of the transition from use to dependence is crucial in the development of prevention and intervention programs [9]. Smoking has been shown to have a strong graded association with adverse childhood experiences, and depressed affect is more common among smokers than among non smokers. This also indicates that primary prevention of adverse childhood experiences and improved treatment of children facing adversity could lead to a reduction in smoking among both adolescents and adults [7]. This study highlights the need for health care providers to screen for a history of abuse and to provide counsel to prevent the onset of tobacco use. Practitioners are now able to be reimbursed for screenings using the CPT code 96110. Service providers such as guidance counselors, therapists, and allied health professionals who may have contact with children experiencing abuse and other types of trauma should emphasize prevention of tobacco use.

The current study is preliminary in nature and there are a number of limitations. The sample size is small and a self-report measure of early life trauma was employed. Measures of chronicity, duration, and persistence of trauma were unavailable. Parental variables, such as parental smoking, as well as the chronological order of smoking and trauma were also not assessed. Nevertheless, a unique aspect of this preliminary study is the assessment of the impact of severe childhood trauma in a group of individuals without comorbid DSM-IV

psychopathology. The findings suggest that traumatized youth may be at a higher risk for the development of cigarette smoking, and that targeting this group may help to improve tobacco use prevention efforts. Further investigation is needed to replicate and extend these findings to help improve our understanding of factors that lead to cigarette smoking initiation, continuation, and cessation. Prospective longitudinal data are needed, starting with trauma histories through the teenage years, to better understand the risk factors associated with the initiation and developmental course of nicotine dependence.

Interventions

This study offers several suggestions for healthcare providers when treating patients. It is clear that when a healthcare provider learns that a patient is experiencing or has experienced childhood trauma, the patient's use of tobacco products should be assessed. These individuals may be at a higher risk for cigarette smoking and nicotine dependence than their peers who have not had traumatic experiences.

One way that clinicians can treat these patients is by ensuring that they provide smoking interventions or appropriate follow-up care to individuals who smoke or are attempting to quit. A study by Sims et al. found that although physicians may be aware of nicotine use among their adolescent patients [27], often they do not provide intervention or monitor their quitting attempts. Current clinical guidelines for the treatment of nicotine dependence recommend the use of counseling which approximately doubles the quit rates when compared to no treatment or usual care in adolescents [28]. Because this age group is at a higher risk for smoking initiation, it is important that healthcare providers provide more rigorous and aggressive monitoring and intervention steps when dealing with such patients, especially those who have a history of childhood trauma.

Other ways of assisting these patients include increased support for mental health screenings by pediatricians. According to Hacker et al., patients are more likely to report mental health issues during acute visits than during annual scheduled exams [29]. Thus, the pediatrician and family medical doctors must be receptive and alert during visits with patients for signs of mental health issues. The role of the primary health care provider in the diagnosis of mental health disorders and intervention with nicotine dependence may also extend beyond the care of the young patient. Winickoff et al. suggest that physicians should discuss intervention and smoking cessation with parents who are smokers during their child's appointment [30]. Because the pediatrician may be the healthcare provider that these parents see most frequently when they take their children for regularly scheduled visits, they can play a role in monitoring smoking cessation. Discussing smoking cessation with parents is important because parents who quit early decrease the probability of their children initiating smoking as adolescents [30].

As the current study shows, individuals with severe life trauma are four times as likely to be current smokers as those who are without this history. Thus, it is important for healthcare professionals to monitor and provide interventions for those who are most at risk for developing nicotine dependence.

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Table 1Demographic Characteristics ($N = 57$)

Variable	Smokers ($n = 33$)	Non-smokers ($n = 24$)	p -value
Age, M (SD)	37.2 (11.9)	35.6 (13.0)	NS
Gender, % male	55	33	NS
Education, % some college	76	100	0.02
Employment, % employed	69	79	NS
Race, % Caucasian	55	54	NS
Marital Status, % single	85	75	NS