The Association Between Adult Attention Deficit Hyperactivity Disorder and Nicotine Use among Medical students

Thesis

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Abdelrahman Atef Shafeq

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List of Abbreviations

Abb.	Full term
5-HTT	Serotonin transporter gene
A	Alpha subunit
ADHD	Attention Deficit Hyperactivity Disorder
ASRS	The Adult ADHD Self-Report Scale
B	Beta subunit
CD	Conduct Disorder
CPT	Cognitive performance test
DA	Dopamine
DAT 1	Dopamine trans-porter gene
DBH	Dopamine beta hydroxylase gene
DRD4	Dopamine D4 receptor gene
DRD5	Dopamine D5 receptor gene
FTND	Fagerstrom Test for Nicotine Dependence
GABA	Gamma-aminobutyric acid
GHQ	General health questionnaire
HTR1B	Hydroxytryptamine receptor 1B gene
IPN	Interpeduncular nucleus
LHb	Lateral habenular body
MAO B	Mono amine oxidase B
MHb	Medial habenular body

List of Abbreviations

Abb.	Full term
nAChRs	Nicotinic Acetylcholine receptor
NRT	Nicotine replacement therapy
PFC	Prefrontal cortex
RMTg	Rostromedial tegmental nucleus
SCQ-A	Smoking consequences questionnaire –Adult
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
USA	United States of America
VTA	Ventral tegmental area

Abstract

Data were processed and analyzed using the appropriate statistical tests as the computerized 10th version of SPSS. We found that (12.7%) of our sample had ADHD, among whom the nicotine dependence score was higher in comparison to non ADHD smokers Moreover we found statistical significant correlation between FTND score and ASRS inattention subscale score (P=0.003), also between FTND score and ASRS hyperactive impulsive subscale score (P=0.04). Our study showed statistical significant correlation between inattention and negative affect reduction (P=0.02), stimulation enhancement (P=0.00), taste (P=0.01) & social facilitation (P=0.01). While the Hyperactive impulsive type show correlation with negative affect reduction (P=0.15) & social facilitation (P=0.004)

Keyword: Rostromedial tegmental nucleus- Prefrontal cortex- Nicotine replacement therapy- United Kingdom- Ventral tegmental area

INTRODUCTION

Although much attention has been drawn to trends in smoking and smoking related diseases in the general population, increasing evidence suggests that individuals suffering from mental illness are at increased risk for tobacco use and nicotine addiction **(*Lasser et al., 2000)*.**

Nicotine dependence is characterized by chronic and repetitive use of nicotine containing products, withdrawal symptoms following cessation of use (e.g., depressed mood, irritability, and restlessness), and an inability to successfully quit despite knowledge that using such products are harmful to one's health ***(APA, 2000*).**

Attention Deficit Hyperactivity Disorder (ADHD) is a genetically heritable, biologically driven disorder that involves developmentally inappropriate levels of inattention, hyperactivity, and impulsivity ***(APA, 2000*).**

Furthermore for many with ADHD, the diagnosis persists into adulthood, resulting in possible justice system contacts and drug abuse problems **(*Barkley et al., 2004*).**

But the presentation of ADHD in adults is different from that in children, in part because of a greater decrease in symptoms of hyperactivity than in symptoms of inattention ***(Faraone et al., 2006*).**

As is the case with many, if not most psychiatric disorders, the prevalence of ADHD symptoms is distributed continuously in the population, In other words, individuals may present with symptoms without meeting the full criteria for the disorder, Data from several population-based studies have found that ADHD symptoms can be associated with smoking behavior, whether or not ADHD diagnoses are present **(*Kollins et al., 2005*).**

ADHD symptoms are positively associated with increased risk for cigarette smoking, nicotine dependence, and recurrent relapses **(*Kessler et al., 2006*).**

The Self-Medication Theory A number of factors may contribute to nicotine use among youths with ADHD, with the self-medication hypothesis receiving the most attention. This hypothesis posits that individuals with ADHD use stimulant-like substances such as nicotine to manage their ADHD symptoms **(*Castle et al., 2005*).**

A related phenomenon that may enhance the self-medication properties of nicotine is that ADHD youths with previous exposure to psychostimulant medication may experience behavioral sensitization to nicotine, on the other hand youths with ADHD who are not taking psychostimulant medication (e.g., methylphenidate [Ritalin]; amphetamine [Adderall]), are more likely to smoke cigarettes than

individuals with ADHD who are receiving stimulant medication ***(Whalen et al., 2003).***

Both ADHD and smoking are highly heritable; genetic factors account for 60%–80% and 56% of the two phenotypes, respectively **(Faraone *et al.*, 2005).**

Moreover, the genetic substrates of ADHD and smoking behavior overlap considerably, with a number of candidate genes, most notably the dopamine D4 receptor gene (DRD4) and the dopamine transporter gene (DAT), exhibiting associations with both phenotypes **(*Munafo et al., 2004).***

From a neuropharmacological perspective, ADHD is hypothesized to be the result of an aberrant striatal dopaminergic system that results in disrupted dopaminergic transmission in corticostriatal circuits. These disruptions, in turn, give rise to the characteristic deficits in executive functioning observed in ADHD patients, Meanwhile smoking seems to be more rewarding in ADHD individuals than in healthy controls due to an amplified dopamine response stimulated by nicotine ***(Volkow et al., 2007*)**.

RATIONALE OF THE WORK

It is well established that ADHD, a highly prevalent neuropsychiatric disorder that begins during childhood, largely persists into adolescence and adulthood.

ADHD is characterized by a diverse range of psychosocial impairments and is highly comorbid with a wide range of other mental disorders. The most prevalent of these are mood disorders, anxiety disorders, impulse control disorders, and substance-use disorders (SUD) .

In adults with persistent ADHD, the prevalence of a comorbid SUD has been estimated at 47% or even higher in some series.

Furthermore, patients with ADHD show significantly higher rates of cigarette smoking than do members of the general population (35 -55%), as compared to 19% -40%.

There is strong empirical support to indicate that youths with ADHD are at greater risk for using nicotine than youths without ADHD.

Hypothesis

Percentage of tobacco use is related somehow to patients with adult ADHD.

AIM OF THE WORK

In our study was:

1- To assess the presence of Adult ADHD symptoms in 5th year medical students.

2- To evaluate the pattern of smoking among the selected sample.

3- To correlate between smoking severity and Adult ADHD symptoms in the selected sample.

4- To highlight smoking severity and outcome expectancy in relation to Adult ADHD.