

Original Research Article

## Screening for Adult Attention-Deficit/Hyperactivity Disorder (ADHD) in Young Male Smokers: A Cross-Sectional Study

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### ABSTRACT

**Background:** Smokers with high nicotine dependence are observed to have symptoms of adult ADHD of varying frequency & severity.

**Objectives:** To screen for adult ADHD in young smokers and to find out its association with severity of nicotine dependence.

**Settings & Design:** Study was done in community setting with a cross sectional analytic type of observational design.

**Materials and Methods:** Young male smokers (18-25 yrs) were recruited at 'Cigarette shops' for the study. Assessment was done sequentially using Modified MINI screen, FTND (Fagerstrom test for nicotine dependence) & then adult ADHD self-report scale (screener 5.0) in each of the subject.

**Statistical Analysis:** Descriptive statistics along with chi square test were used.

**Results:** A total of 100 subjects were included in the study. Out of them, 19 (19%) were found to screen positive for adult ADHD. Among 19 positively screened subjects, 13 (68.4%) were found to rate high to very high for nicotine dependence on FTND. Whereas from remaining 81 subjects found negative for adult ADHD, 30 (37.03%) were found to rate high to very high on FTND. This difference in proportion was found significant (P value = 0.026, OR=3.683 with 95% CL 1.267 to 10.709) and subjects having high to very high nicotine dependence had 3.683 times more adult ADHD than those with very low to moderate nicotine dependence.

**Conclusion:** The results of the current study indicate that proportion of high to very high nicotine dependence among young male smokers who screened positive for adult ADHD was significantly higher in comparison to those who screened negative for adult ADHD. Thus, diagnosis and treatment of adult ADHD among smokers is important and may lead to better abstinence rates also.

**Keywords:** FTND, adult ADHD, ASRS, Modified MINI screen.

### INTRODUCTION

Adult attention-deficit/hyperactivity disorder (ADHD) has only recently become the focus of widespread clinical attention. It has long been known that ADHD often persists into adulthood [1,2]. Attempts to estimate adult ADHD prevalence by extrapolating from childhood prevalence estimates linked with adult persistence estimates [3] and direct estimation in small

samples [4] yield estimates in the range 1-6% of general population.

More than 40 per cent of adults with ADHD are smokers compared with 26 per cent of the general population. [5] The high prevalence of smoking among adolescents and adults with ADHD and the stimulant-like properties of nicotine suggest that ADHD patients may smoke as a form of self-treatment for their symptoms. However,

data on prevalence of ADHD in nicotine dependent subjects is scarce.

With this information in background, we planned this study to explore the relationship between severity of smoking and presence of adult ADHD.

### **Objectives**

This study was planned:

1. To screen for Attention Deficit Hyperactivity Disorder (ADHD) among a sample of young male smokers.
2. To find out the relationship of ADHD symptoms with severity of nicotine dependence.

### **MATERIALS AND METHODS**

A community based Cross-sectional observational study of was conducted in year 2013 by department of Psychiatry, SMS Medical College, Jaipur. Ethical clearance was taken from ethics committee of the institute before beginning the study. A sample of 100 young male smokers was recruited from various 'cigarette shops' for the study after taking appropriate written informed consent. The potential confounders could be the characteristics of the type of cigarettes smoked and the lifestyle adopted by the subject. The various brands of cigarettes smoked could be different in the type of tobacco, filter characteristics, nicotine content, tar content, other substances which could affect the pattern of smoking habit. In the present study subjects smoking one of the most popular brands (name not disclosed) of filtered cigarettes and of almost same lifestyle were included to minimize the confounding effect associated with the exposure.

**Inclusion criteria:** Young male smoking filtered cigarettes aged between 18-25 yrs with almost same life style and were ready to give consent.

**Exclusion criteria:** Those who were having co-morbid medical or psychiatric illness and those who were not able to understand questionnaires were excluded.

Every eligible subject was interviewed with pre-designed semi-structured pro forma, comprising demographic profile, modified MINI screen, [6,7] FTND (Fagerstrom test for nicotine dependence) [8] & adult ADHD self-report scale screener. [9] Socio demographic profile included general information like age, education, marital status, rural/urban, history of other substance abuse, history of any other significant psychiatric or medical illness etc. An initial screening evaluation was done with modified MINI screen, to rule out any co-morbid psychiatric disorder. It was followed by assessment of severity of nicotine dependence using Fagerstrom test for nicotine dependence [FTND] questionnaire. The subjects were further sub-classified on the basis of severity of nicotine dependence for subsequent analysis. Finally, ASRS v1.1 screener symptom checklist based on DSM-IV criteria for diagnosis of adult ADHD was applied on subjects.

The Fagerström test for nicotine dependence [FTND] is a reliable and valid, self-reporting instrument for assessing cigarette use, severity of physical dependence on nicotine in current smokers. It consists of 6 questions, & scores are classify subjects as very low (0-2), low (3-4), moderate (5), high (6-7) & very high dependence (8-10).

The ASRS v1.1 Screener is a part of the Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist, which is an instrument consisting of the eighteen DSM-IV TR criteria. Six of the eighteen questions were found to be the most predictive of symptoms consistent with ADHD.

Descriptive statistical analysis tools were used to analyze the outcomes for variables, which were qualitative in nature. Chi square test (p value) was used to test the association for the outcomes obtained.

### **RESULTS**

Out of initial sample of 122 subjects, 100 subjects were included in final analysis, as 22 subjects were having high scores on

modified MINI screen, thus requiring detailed assessment for psychiatric illness. Hence, 100 subjects were included in the study for further analysis.

Out of total of 100 subjects were included in the study, 19 (19%) were found to screen positive for adult ADHD and 81 (81%) were found to screen negative for adult ADHD.

**Table I: Distribution of Study Population: Young (18-25 years) male smokers**

S. No.	Variable	Study Population
1	Sex	100 Males
2	Occupation	College Students
3	Mean age (in Years)	21.57 yrs. +/- 1.98 yrs.
3	Rural / urban (in %)	47 / 53
4	ASRS Positive/Negative	19/81
4	FTND (high to very high) / (very low to moderate)	43/57

**Table II: Association of ASRS and FTND in Study Population**

S. No.	ASRS Test (for adult ADHD)	FTND		Total
		* Positive FTND	**Negative FTND	
2	ASRS Positive + (n)	13	6	19
3	ASRS Negative - (n)	30	51	81
4	Total	43	57	

Odds ratio = 3.683 (95% confidence interval: 1.267 to 10.709 )  
Chi-square = 4.970 with 1 degree of freedom; P = 0.026

\* FTND+ = scores high to very high (6-10); \*\* FTND- = scores very low to moderate (1-5)

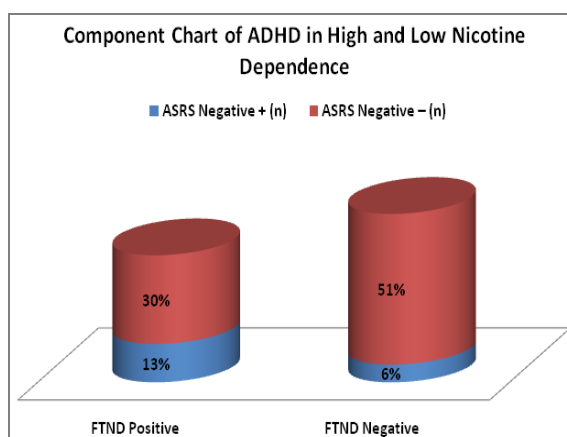
Among 19 positively screened subjects, 13 (68.4%) were found to rate high to very high for nicotine dependence on FTND whereas out of 81 subjects screened negative for adult ADHD, 30 (37.03%) were found to rate high to very high on FTND. This difference in proportion of subjects with high to very high for nicotine dependence on FTND in adult ADHD positive and adult ADHD negative i.e. 68.4% and 37.03% respectively was found significant. (P=0.026).

on FTND, merely 6 (10.5%) screened positive for ADHD. This proportion of adult ADHD (13/19) in subjects having high to very high score on FTND were 3.683 times more than proportion of adult ADHD (30/81) in subjects having very low to moderate score on FTND. (OR=3.683 with 95% confidence limit 1.267 to 10.709) and this was also found to be statistically significant.

## DISCUSSION

In the present study it was found that proportion of adult ADHD in subjects having high to very high score on FTND were 3.683 times more than proportion of adult ADHD in subjects having very low to moderate score on FTND. (OR=3.683 with 95% confidence limit 1.267 to 10.709) and this was found to be statistically significant (P=0.026). 68% of the subjects with high to very high nicotine dependence screened positive for adult ADHD compared to only 30% among those with very low to moderate nicotine dependence on FTND.

Similar findings have been reported by Fuemmeler et al 2007, who analyzed a sample consisting of a nationally representative cohort of U.S. adolescents (n = 13,494) and used logistic regression to examine ADHD symptoms from both the



**Figure 1**

On further analysis, it was found that among 43 subjects having high to very high score on FTND, 13 (30.23%) were found positive for ADHD while out of remaining 57 subjects with very low to moderate score

inattentive (IN) and hyperactive-impulsive (HI) domains and smoking trajectories. They reported that inattention and hyperactivity-impulsivity symptoms were associated with nicotine dependence among current smokers (IN:  $\beta = 0.17$ ,  $SE = 0.03$ ,  $p < 0.0001$ ; HI:  $\beta = 0.10$ ,  $SE = 0.04$ ,  $p = 0.01$ ).<sup>[10]</sup> ADHD symptoms are known to lead to earlier initiation, higher severity & increased difficulty in smoking cessation. Adolescents with ADHD report earlier initiation of smoking and report more difficulty quitting than individuals in the general population.<sup>[11-14]</sup>

In comparison to studies of adolescents with ADHD and smoking, there are fewer studies of adults. A study conducted on 60 adult outpatients, with an ADHD diagnosis according to *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* and 60 age- and gender-matched controls, assessed smoking habits with the FTND. The authors replicated earlier findings in adolescents confirming a higher rate of smokers in the ADHD group. The adult smokers with ADHD suffered from more severe nicotine dependence and smoked significantly more often when being sick.<sup>[15]</sup>

These studies point in the direction of nicotine being a means of self treatment of adult ADHD symptoms, which could be a factor among many others for higher rates of nicotine dependence seen in adult ADHD subjects.

There could be alternative explanations to higher smoking rates among adult ADHD subjects. Smokers have higher levels of novelty seeking than the non-smokers and an alternative explanation to account for higher smoking among adult ADHD subjects could be that it is a correlated phenomenon of their general pattern of stimulus seeking rather than a means of treating their primary symptoms.<sup>[5]</sup>

Thus further studies are warranted to clarify the causal relationship between adult ADHD and smoking patterns but current study highlights the fact that attention

deficit disorder among such adults can be highly co-morbid with nicotine dependence in accordance with its severity.

## CONCLUSION

Present study reveals that adult ADHD is co-morbidity among young male smokers, especially those with high to very high nicotine dependence. However, this study has its own limitations like being a cross sectional study design, lack of comparison with normal controls and no assessment of neurobiological correlates of ADHD. But, with further studies of larger samples, improved methodology & prospective study design we will be able to generate better evidence to support the screening for adult ADHD in management of nicotine dependent subjects, especially those with high to very high severity. The treatment of co-morbid adult ADHD symptoms may in fact lead to better smoking abstinence rates also.

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