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Prevalence of Attention Deficit Hyperactivity Disorder (ADHD) over Methamphetamine (Glass) Abusing Adults

Meysam Shabanzadeh [1], Masoud Mozhdehi Fard [1], Ruohollah Seddigh [2], Amir-Abbas Keshavarz Akhlaghi [2], Mansour Salehi [2], Elham Shirazi [3], Hasti Hadizadeh [4], Reza Bidaki [5,*], Fariba Kabiri [6], Ehsan Zarepur [7]

[1] Department of Psychiatry, Tehran Institute of Psychiatry, Faculty of Behavioral Science and Mental Health, Iran University of Medical Sciences, Tehran, Iran
[2] Mental Health Research Center, Iran University of Medical Sciences, Tehran, Iran
[3] Mental Health Research Center, Tehran Institute of Psychiatry, School of Behavioral Sciences and Mental Health, Iran University of Medical Sciences, Tehran, Iran
[4] Student Research Committee, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran
[5] Department of Psychiatry, Research Center of Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[6] Islamic Azad University of Khorasgan, Isfahan, Iran
[7] Student Research Committee, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

** Corresponding author: Reza Bidaki, Department of Psychiatry, Research Center of Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical Sciences, Yazd, IR Iran. Tel: +98-3536232003, Fax: +98-3532633555, E-mail: Reza_Bidaki@yahoo.com*

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Abstract

Introduction: The relationship between Attention Deficit Hyperactivity Disorder (ADHD) and drug abuse has been indicated in earlier studies. This study was aimed to compare the prevalence of ADHD between Methamphetamine (Glass) abusing and dependent adults, referring to addiction treatment centers in Tehran, with a Control group.

Methods: In this cohort study, the case group included the over-18-year individuals with only glass abuse background and an at least 1-month interval from their last abuse, referring to the specialist addiction treatment clinic of Iran Psychiatry Hospital and two outpatient addiction treatment centers on West and East Tehran, September 2014 to August 2015. The control Group included some 18-year and above staff at that hospital. The cases were given a combination of three questionnaires and provided with the necessary explanations to answer them. The obtained information was analyzed statistically using SPSS (chi square Test and the t-test).

Results: Both the case and the control groups included 60 individuals with a mean of 30.8 years (SD = 8.92) and 32.29 years (SD = 6.85) respectively. The females in the case and control were 10 16.7%) and 37 (62.5%), respectively. The mean scores for the Wender Utah Rating Scale were also 20.21 ± 62.16 and 10.31 ± 14.37. Based on the test analysis, there were some evidence for childhood ADHD for 71.7% of the case group and only 1.6% of the control group. The results of the CAARS questionnaire represent a possible diagnosis of adulthood ADHD for 63.3% of the case group and 1.6% of the control Group.

Conclusions: ADHD is much more prevalent over Methamphetamine abusers than the normal population. This dramatic difference indicates the necessity of ADHD examinations to plan an appropriate treatment plan and implementing a more effective treatment for them.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a common disorder starting in childhood, often transmitted genetically [1]. Its high prevalence is thought to be the reason for its importance. The results of a systematic review of the prevalence of this disorder in childhood indicate a prevalence of 4 to 20% in Iran [2]. A total 50-70% of ADHD cases are continued to adulthood [1-3]. Researchers estimate the ADHD prevalence in adulthood as 4-2% [1] and recent evidence support the 4% of prevalence [4]. ADHD widely influences the behavior, the level of social skills, interpersonal relations, education and occupation of the patients [5]. They are at a higher risk of developing psychiatric disorders such as depression and anxiety. Other problems of these patients may include low self-esteem, academic failure, marital problems and failure in maintaining their long-term relationships with others [3]. Drug abuse is also a common problem over people with ADHD [3]. They are clearly more absent at work days, are more likely to change jobs and do things with a poorer quality. Also, their educational level is lower and, regardless of their lower levels of education, they are less busy with full-time jobs and often earn lower incomes [1].

In some studies, drug abuse was significantly more prevalent over those suffering from ADHD than the control group [6]. Adults suffering from ADHD start nicotine consumption at lower ages, indicate higher levels of nicotine addiction And have more problems in continuing their smoking quit term [7]. In recent years, methamphetamine (glass) abuse has been increasing in Iran, especially over the young population, with the abuse of this stimulus substance bringing about lots of personal and socio- economic consequences [8-10].

Patients suffering from both ADHD and Substance Use Disorder (SUD) have often started addiction at lower ages, consume more drugs and have more hospitalization histories than SUD patients not suffering from ADHD [11]. Given that similar studies were not found in Iranian patient population and new studies indicate the effect of stimulus drugs over the population of methamphetamine dependent patients, studying the frequency of this disorder over these patients seems important. The patients identified in this study might be included in similar studies regarding the effectiveness of treatment with stimulus drugs in decreasing relapse rates and increasing their refinement in the future, and this study can be a starting point for designing an information center of Methamphetamine dependent patients with adulthood ADHD. In this study we aimed to compare the Prevalence of attention deficit hyperactivity disorder (ADHD) between methamphetamine (Glass) Abusing Adults and a Control group.

METHODS

This is a cohort study conducted at the specialist addiction treatment clinic of Iran Psychiatry Hospital and two outpatient addiction treatment centers on West and East Tehran, September 2014 to August 2015, using convenient sampling method. The fundamental principles of WMA Declaration of Helsinki (Ethical Principles for Medical Research Involving Human Subjects) and the Ethics Committee of Iran University of medical sciences were adhered to in all research stages. The information was recorded confidentially, the necessary explanations were provided to patients and no additional costs were imposed on them.

Sample Entry Criteria

The case group included the over-18-year individuals with only glass abuse background and an at least 1-month interval from their last abuse so that they were showing symptoms neither of methamphetamine intoxication nor of quitting it.

Sample Exit Criteria

Those suffering from axis 1 psychiatric disorders including psychotic disorders, mood disorder, anxiety disorders and drug dependence disorders other than Methamphetamine abuse and dependence, except nicotine dependence, determined based on SCIDI questionnaire. Patients with epilepsy, major cognitive disorders and mental retardation were also excluded from the study based on a clinical interview performed by a psychiatric resident.

Control Entry Criteria

The control Group included some 18-year and above staff at Iran Psychiatry Hospital.

Control Exit Criteria

The presence of psychotic disorders, mood disorder, anxiety disorders and drug dependence disorders other than Methamphetamine abuse and dependence, except nicotine dependence, studied using the questionnaire. The over 18-year individuals with only methamphetamine consumption background were studied. Through an initial interview and a urine test by the physician at addiction treatment center, those diagnosed with only dependence on methamphetamine (except nicotine dependence) were introduced to the psychiatric resident, to be included in the study. That resident interviewed them based on SCID-I. Those suffering from axis 1 psychiatric disorders were excluded; disorders including psychotic disorders, mood disorder, anxiety disorders and drug dependence disorders other than Methamphetamine abuse and dependence, except nicotine dependence, were confirmed based on the very questionnaire. All interviews were conducted based on SCIDI questionnaire by a single resident

whose ability to fill it out was confirmed by two faculty member psychiatrists. The demographic questionnaire, the Wender Utah Rating Scale, and the Conner's Adult ADHD Rating Scale (CAARS) were then given to patients. The control group was also selected from healthy non-drug consuming people (except cigars), who were free from psychotic disorders, mood disorder, anxiety disorders and drug dependence disorders other than Methamphetamine abuse and dependence, except nicotine dependence, studied using SCIDI questionnaire. They also filled in the research questionnaires including a demographic questionnaire, the Wender Utah Rating Scale, and Conner's Adult ADHD Rating Scale (CAARS).

The SCIDI Questionnaire

It is a semi-structured interview providing some diagnosis. It was semi-structured according to DSM-IV because its performance required a clinical judgment by the interviewer on the interviewee responses; hence, the interviewer must have clinical expertise and knowledge on psychopathology. This type of interview is closer to the physician's clinical practice and is considered as its very main advantage. Additionally, one of the purposes of its makers was an interview design which could easily be applied by clinical specialists despite its structuring. It evaluates axis 1 psychotic disorders based on DSM IV. The Kappa, diagnosis agreement percentage, sensibility and specificity indexes were applied to check its validity. Kappa was higher than 4.0 in all diagnoses but not in all anxiety disorders. Considering the presented diagnoses by the psychiatrists as Gold Standard, specificity results were mostly better than sensitivity results. In most diagnoses, specificity was over 0.85 in one half of which it was 0.9 which indicates an acceptable specificity. The sensitivity index was somehow lower. The Persian version of SCID was a valid tool for making diagnosis for clinical and especially research and even educational purposes. Hence, its application is recommended for above-mentioned purposes in clinical environments [10].

Wender Utah Rating Scale (WURS)

This 25-item scale, considered as a useful tool for diagnosing ADHD in childhood, can diagnose ADHD in childhood and is sensitive to childhood ADHD [11]. This scale is analyzed and interpreted as follows: each choice has a score, then the scores for all choices are summed up in each questionnaire (the total score) indicates either suffering or not from childhood ADHD over studied subjects. According to this latest study, the cut-off point for the questionnaire will be considered 30 [12]. Wender test is applied for ADHD diagnosis both over children and adults. The original test consists of 61 questions but moderated to include 25 questions. This scale was translated, and its validity and reliability were tested in Iran by Poria Sarrami, Ph.D. at Medical University of Isfahan in 2000. The results obtained from its Persian translation were to a large extent close to the obtained results from the original version in the USA. The reliability coefficient was obtained 0.95 in this study [13].

Conner's Adult ADHD Rating Scale (CAARS)

It includes two types of self-report and observer report questionnaires each having three versions:
(1) The short-form; (2) the extended form; 3. The screening version.
Conner's scale contains three question groups: (1) group A evaluating DSM-IV attention deficit symptoms (9 items); (2) group B measuring DSM-IV hyperactivity-impulsivity (9 items) and (3) group D studying the ADHD index (12 items)."Not at all" and "never" options are scored 0, "a little" and "sometimes" are scored 1, "mostly" and "usually" are scored 2, and "many often" and "always" are scored 3.
The screening version of the Self-Report (CAARS-S: SV) was applied in this study which contains 30 questions evaluating present ADHD symptoms. The validity of this scale is 85%, and regarding its reliability, the correlation coefficient of its retest was obtained from 0.88 to 0.91 depending on various items included in the questionnaire [14-16].
Four sets of scores are obtained from this scale: score A is the total for A items, score B is the total for B items, score C is the total for A and B items, and score D is the total for C items. Each set is called a T score determined based on the existing profile in the scale guide. It indicates the deviation from normal condition considering age and gender factors. The mean T score is 50 and its SD is 10. Those with a score of a double SD above the mean in A, B or C sub-scores and a Wender score of 30 or above are diagnosed with adulthood ADHD [15].
The validity of this scale is 85%, and regarding its reliability, the correlation coefficient of its retest was obtained from 0.88 to 0.91 depending on various items included in the main questionnaire [17].
In this study, the validity and reliability of Persian CAARS-S: SV was determined above 0.80 through Cronbach's alpha and the results indicated that this version can be used as a screening tool for adulthood ADHD in Iran [10].

Statistical Analysis

The resulted scores from each scale and the interview using other variables were put into and analyzed using the SPSS20. Agreement graphs and charts were applied as descriptive statistics, and statistical chi square Test and the t-test were applied for data analysis of qualitative and quantitative variables, respectively. Based on

Table 1: Possible Distribution of Childhood and Adulthood ADHD Diagnosis Over Both Groups

	Case (n = 60)	Control (n = 60)			
Diagnosis	**No. (%)**	**No. (%)**	**Odds Ratio**	**Confidence Interval**	**P Value**
ADHD Childhood (n = 198)	43 (71.7)	1 (1.6)	34.40	-240 4.91	< 0.001
ADHD Adulthood (n = 39)	38 (63.3)	1 (1.6)	29.76	-208 4.24	< 0.001

Abbreviation: ADHD: Attention Deficit Hyperactivity Disorder

the significance level, the results for all tests were interpreted according to P-Value < 0.05 for both scopes.

RESULTS

A total 120 individuals, an equal number of 60 participants were included per case and control groups. The mean ages were 30.8 (SD = 8.92) and 32.29 (SD = 6.85) in case and control, respectively. There were 10 (16.7%) females and 50 (83.3%) males in the case and 37 (62.5%) females and 13 (29.2%) males in the control.

There were 32 (54.2%) singles, a total 18 (30.5%) married and 9 (15.3%) widowed in the case and a total 14 (23.3%) had a history of a previous marriage. There were 22 (37.9%) singles and 36 (62.1%) married in the control and just 1 (1%) had a history of a previous marriage.

The educational levels of the cases were as follows: an individual (1.7%) was illiterate, a total 12 (20%) finished their primary school, a total 20 (33.3%) held secondary school degrees, a total 20 (33.3%) held high school diplomas, a total 5 (8.3%) held associate degrees and 2 (3.3%) held Bachelor's degrees. The educational levels of the controls were as follows: a total 4 (8.3%) held secondary school degrees, a total 13 (27.1%) held high school diplomas, a total 2 (4.2%) held associate degrees, a total 22 (45.8%) held Bachelor's degrees, and 7 (14.6%) held either masters or doctorate degrees.

The employment status of cases was as follows: a total 28 (47.5%) were unemployed, a total 10 (16.9%) were workers, a total 4 (6.8%) were employees and 17 (28.8%) were self-employed. The employment status of controls was as follows: a total 2 (4.1%) were workers, a total 41 (83.7%) were employees and 5 (10.2%) were self-employed.

Mean scores of the Wender Utah Rating Scale were 20.21 ± 62.16 and 10.31 ± 14.37 in case and control groups, respectively. Based on the test analysis, there were some evidence for childhood ADHD for 71.7% of the case group and only 1.6% of the control group. Table 1 indicates the distribution of a possible diagnosis of Childhood and adulthood ADHD over case and control groups.

The distribution of T-scores was studied in the statistical population of each Conner's scale subscale to check Adulthood ADHD. The T scores were normally distributed with a mean of 50 and an SD of 10. Values close to 50 indicate that the individual is in the mean range and the higher scores indicate a problem.

In Conner's scale for studying Adulthood ADHD, the mean scores for A (Attention) sub-scale In the case and the control groups were 56.97 (SD = 6) and 41.09 (SD = 6.29), respectively.

The mean scores for A (Attention) sub-scale in the case and the control groups were 56.97 (SD = 6) and 41.09 (SD = 6.29), respectively. The mean scores for B (hyperactivity) sub-scale in the case and the control groups were 56.49 (SD = 7.51) and 41.71 (SD = 5.72), respectively. The mean scores for D (ADHD index) sub-scale in the case and the control groups were 57.06 (SD = 6.33) and 40.98 (SD = 5.56), respectively.

In the Attention subscale, there were 30% with a T-score of 55-60 and 31.7% with a T score over 60 among the cases, whereas this rate was 1.6% in 55-60 range and 1.6% in over 60 among the control group. In the Hyperactivity subscale, there were 15% with a T-score of 55-60 and 38.3% with a T score over 60 among the cases, whereas there was no one with a score over 55 among the control group. In the ADHD subscale, there were 16.7% with a T-score of 55-60 and 41.7% with a T score over 60 among the cases, whereas this rate was 1.6% in 55-60 range and no one was over 60 among the control group.

DISCUSSION

ADHD, either directly or due to conduct disorder, is a major risk factor for Substance Use Disorder (SUD). ADHD negatively affects the SUD. Patients suffering from both ADHD and SUD have often started addiction at lower ages, consume more drugs and have more hospitalization histories than SUD patients not suffering from ADHD [11]. ADHD is also associated with higher levels of drugs after an addiction treatment [16]. Medical studies also have always demonstrated that the ADHD treatment with methylphenidate or automoxitine is not as much effective as in patients with a concurrent SUD than in other ADHD patients, and patients with both SUD and ADHD require cognitive behavior therapy (CBT) [18-20].

The Mean score of the Wender Utah Rating Scale was 20.21 ± 62.16 and 10.31 ± 14.37 in case and control groups, respectively. Based on the test analysis, there

were some evidence for childhood ADHD for 71.7% of the case group whereas this rate was only 1.6% over the control group. In other words, the Childhood ADHD was 40 times more probable over the Methamphetamine abusers than over the normal people.
Based on Conner's scale, the adulthood ADHD was 29 times more probable over the Methamphetamine abusers than over the control group. The disorder level was high in turn in attention, hyperactivity and ADHD.
According to Arias et al., a total 1761 adults diagnosed with cocaine and/or opioids dependence were examined for ADHD. It was indicated that ADHD is about 5 times more prevalent over drug dependents than over normal individuals in life-time [11].
In a meta-analysis research to study ADHD prevalence over patients with SUD, Oortmerssen et al. reported that 23.1% of all suffering from drug dependence regarding DSM criteria suffered also from ADHD. ADHD prevalence over cocaine dependents was lower than over dependents on alcohol, opioids and other drugs. It was finally concluded that 1 in every 4 drug dependents suffers from ADHD [12].
According to Kaye et al. in a research to study ADHD prevalence over users of illegal psycho-stimuli, it was indicated that about a half (45%) of them suffered from Adulthood ADHD. Meanwhile, the symptoms of lack of attention (90%) are more than hyperactivity/impulsivity (57%) symptoms; which is in line with our obtained results. Among those screened with positive adulthood ADHD, only 17% were diagnosed with background ADHD, where this low amount also indicates the necessity of paying more attention to examining the drug abusers for ADHD. Those diagnosed with ADHD were different from others in some ways: an earlier start of drug abuse and injecting drugs, consumption of more diverse substances, higher frequency of recent stimulant and injection drugs, higher probability of dependence on stimulant substances and higher probability of receiving treatments for drug dependence. After removing the interrupting factors, ADHD was associated with lower education, an earlier start of regular Tabaco consumption, and consumption of more diverse drugs [14].
ADHD is much more prevalent in people with drug abuse than the normal population. The considerable difference in ADHD prevalence over Methamphetamine abusers than others indicates the need for examining the abusers for ADHD to make an appropriate treatment plan and implement a more effective treatment for them.

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CONFLICTS OF INTEREST

None to declare.

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AUTHORS' CONTRIBUTION

All authors participated in the study.

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