

PREVALENCE OF AUTISM SPECTRUM DISORDERS (ASD) AND ATTENTION DEFICIT HYPERACTIVITY DISORDERS (ADHD) AMONG ADULT PSYCHIATRIC PATIENTS REPORTING AT A TERTIARY CARE HOSPITAL

Sana Khan, Rashid Qayyum, Javaid Iqbal*

Armed Forces Institute of Mental Health/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Pak Emirates Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objective: To determine undiagnosed burden of autism spectrum disorder and attention deficit hyperactivity disorder and associated socio-demographic factors among adult psychiatric patients.

Study Design: Descriptive cross sectional study.

Place and Duration of Study: Study was conducted at Tertiary Care Hospital Rawalpindi, from Jun to Nov 2018.

Material and Methods: The sample population comprised of 1889 adult patients reporting for psychiatric evaluation and treatment at a tertiary care mental health hospital in Rawalpindi Pakistan. Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder were screened by using screening tools which are Adult Autism Spectrum Quotient (AQ) and ADHD Self-Report Scale-V1.1 (ASRS-V1.1) respectively. Relationship of age, gender, socioeconomic status, illicit substance use, marital status, education and response to treatment was assessed with the presence of ASD and ADHD.

Results: Out of 1889 adult patients screened through AQ and ASRS, 78.9% were screened negative on both the screening tools while 12.5% were positive on AQ and 13.5% were positive on ASRS. 8.6% of the screening positive patients had diagnosis of ASD and 11% had diagnosis of ADHD after clinical interview with the consultant psychiatrist. Ten patients had both ASD and ADHD. After applying the logistic regression we found that male gender, illicit substance use, low education and inadequate response to treatment had significant association with the presence of ASD and ADHD among the adult psychiatric patients.

Conclusion: This study showed a high prevalence of ASD and ADHD among the adult psychiatric patients of Pakistan reporting for the psychiatric evaluation. Special attention should be paid to the male and low education patients. Illicit substance use and poor response to treatment also emerged as independent risk factors linked with presence of ASD and ADHD among the target population.

Keywords: ADHD, ASD, Prevalence, Socio-demographic factors.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorders (ASD) are related with substantial individual and societal health burden¹. Both ASD and ADHD are neurodevelopmental disorders which start during early childhood and have a long and chronic course. Former is characterized by repetitive and stereotyped patterns of behavior, impairment in communication and social interactions that may be associated with intellectual disabilities, language impairments and impaired motor or atten-

tive behaviors and later is characterized by inattentive, hyperactive, and impulsive behaviors that are not found in normally developing children^{2,3}. Although ASD (1.5%)⁴ and ADHD (3.5%)⁵ is well documented in the pediatric population but its adult burden remains undiagnosed due to its considerable comorbidity with psychiatric disorders such as Schizophrenia, Mood disorder, Anxiety, Obsessive compulsive disorder, Depression, Personality disorder, Eating disorder, Substance abuse and Others^{1,6}. This comorbidity sometime mask the symptoms of underlying ASD or ADHD and treating psychiatrist could only pick these with detailed history specially developmental history but the first and foremost requirement is to have knowledge of pattern and

Correspondence: Dr Sana Khan, Resident Psychiatry, AFIMH, Rawalpindi Pakistan (Email: waved08@gmail.com)

Received: 18 Jan 2019; revised received: 12 Mar 2019; accepted: 03 Apr 2019

frequency of these disorders among the adult population.

Recent studies suggest that some children with ADHD do not “outgrow” the disorder when they reach adulthood and in addition ADHD may emerge after childhood⁷⁻⁹. Among adults with ADHD 90% did not meet diagnostic criteria in childhood⁸. Moreover adults with ADHD exhibit high rates of comorbid psychiatric disorders as compared with childhood ADHD¹⁰. Adult ADHD has an estimated prevalence of 15% to 65%¹¹. Early recognition and optimal treatment of ADHD among adults visiting psychiatry facilities on account of comorbid disorders will alter the course of psychiatric morbidity¹.

ASD shares multiple phenotypic similarities with ADHD and occur at high rates with other disorders like schizophrenia². The inability to cope with the environmental demands and physical discomfort among autistic patients results in maladaptive behaviors and associated features of autism. These behaviors may mimic or co-occur with other psychiatric disorders like borderline personality disorder^{4,12}.

Child and adolescent psychiatry services are still underdeveloped in our country so screening of most of the patients of these disorders has not been possible. Few studies are available which are done on the local children regarding ASD and ADHD¹³⁻¹⁵ but author could not find any study that has been done on the adult population. Our study was planned with the aim to determine undiagnosed burden of ASD and ADHD and associated socio-demographic factors among adult psychiatric patients reporting at a tertiary care hospital of mental health.

MATERIAL AND METHODS

This point prevalence cross sectional survey was conducted at a tertiary care hospital of mental health one of the largest facility in the country for a period of 6 months from June to November 2018. All adult patients (≥ 18 years of age) diagnosed with psychiatric disorders (meeting criteria of DSM V for each disorder) were included in the study through conventional

universal sampling after taking written informed consent.

After permission from the hospital ethical review committee, socio-demographic information of all the participants was collected including gender (male/female), age at interview (categorized as 18-40 and 40+), marital status (married-cohabitating and separated-widowed-divorced, never married), occupation (working and homemaker or retired), and income, classified into two categories (less than outgoing and more than or equal to outgoings), based on the recent economic survey done in Pakistan¹⁶. Response to treatment was classed as adequate if there is considerable improvement in symptoms and inadequate if there was no considerable improvement in the symptoms. Illicit substance use was inquired in detail according to the classification of mental and behavioral disorders due to substance use in ICD-11 criteria. Psychiatric diagnosis was made according to the DSM V criteria by a consultant psychiatrist as diagnosis for adult ASD and ADHD is deficient in ICD-11. A team of psychiatrist and psychologist was designated for this study at the start and were given detailed briefing. After the confirmation of primary psychiatric diagnosis and application of exclusion and inclusion criteria by detailed history taking and relevant laboratory investigations participants of study filled Urdu version of self-report screening tool. Patients with diagnosis of ASD and ADHD prior to our assessment, patients with learning disability, patients with a chronic neurological illness and patients who did not give consent were excluded from the study. Patients diagnosed with any childhood psychiatric disorder like conduct disorder, childhood depression or early onset schizophrenia were also excluded from the study. Patients with hyperthyroidism, SLE and IDDM or any other chronic physical illness were also part of the exclusion criteria.

Adult Autism Spectrum Quotient (AQ) Various scales have been used worldwide to screen the adult patients for autism spectrum disorders. We preferred to use AQ because of its good validity and reliability. It is a 50 item scale

used to screen the adults for autism spectrum disorder. Validated Urdu version available on the official website of Autism Research Center was used in the study¹⁷.

Adult ADHD Self-Report Scale-V1.1 (ASRS-V1.1) Screener A shorter 6 point version was used to screen the adult patients for ADHD. It is a simple and easy to administer psychometric tool to screen the adult population for the symptoms of ADHD. Validated Urdu version available on official website of Harvard university was used in our study¹⁸.

Patients positive on initial screening were evaluated by the consultant psychiatrist to confirm the diagnosis on the basis of DSM V criteria. A special proforma was designed for the study to inquire the relevant socio-demographic variables.

Statistical analysis was performed using SPSS version 23.0. Mean and standard deviation were calculated for quantitative variables. Frequency and percentage was calculated for qualitative variables. Binary logistic regression analysis was done to correlate the socio-demographic factors (age, gender, socioeconomic status, illicit substance use, marital status, education and response to treatment) with the presence of ASD or ADHD among the target population. A *p*-value

were female. Mean age of the patients was 36.24 ± 3.72. Affective disorders were the commonest condition followed by the anxiety disorders in

Table-I: Characteristics of study participants (n=1889).

Age (years)	
Mean ± SD	36.24 ± 3.72
Range (min-max)	18-59 years
Gender	
Male	679 (35.9%)
Female	1210 (64.1%)
Psychiatric Diagnosis	
Affective disorders	1199 (63.4)
Anxiety disorders	299 (15.8)
Substance abuse	110 (5.8)
Schizophrenia	96 (5.1)
Sexual disorders	42 (2.2)
Somatoform disorders	36 (1.9)
Sleep disorders	35 (1.8)
Delusional disorder	19 (1.1)
Personality disorder	18 (0.9)
Dementia	16 (0.8)
Others	13 (0.6)

our sample population. Dementia was the least reported psychiatric presentation among the target population. Out of 1889 adult patients screened through AQ and ASRS, 1518 (78.9%) were found negative on both the screening tools while 237 (12.5%) were positive on AQ and 256 (13.5%) were positive on ASRS. 32 (8.6%) of the screening positive patients had diagnosis of

Table-II: The correlated factors relating with presence of ADHD and ASD among the study participants: the binary logistic regression.

	B	p-value	OR (95% CI)
Age (ref. is <40 years)	-0.071	0.552	0.931 (0.726-1.178)
Gender (ref. is female)	0.289	0.016	1.335 (1.056-1.689)
Socioeconomic status (ref. is income greater than outgoing)	0.137	0.267	1.147 (0.901-1.461)
Treatment response (ref. is adequate response)	0.485	0.0001	1.625 (1.283-2.057)
Illicit substance use (ref. is no use)	0.410	0.001	1.507 (1.184-1.917)
Marital status (ref. is married)	0.047	0.699	1.048 (0.827-1.328)
Education (ref. is matriculate)	0.386	0.002	1.471 (1.152-1.879)

≤0.05 was taken as significant.

RESULTS

A total of 1889 patients were included in the final analysis after the application of inclusion and exclusion criteria. Six hundred and seventy nine were male and twelve thousand and ten

ASD and 41 (11%) had diagnosis of ADHD after clinical interview with the consultant psychiatrist. Ten patients had both ASD and ADHD. After applying the logistic regression we found that male gender, illicit substance use, low education and inadequate response to treatment had

significant association with the presence of ASD and ADHD among the adult psychiatric patients (table-II).

DISCUSSION

ADHD and ASD have usually been considered as diagnosis of children and adolescence. Adult patients usually have not been targeted to be screened for these disorders. Main problem in our part of the world is that sub specialties linked with psychiatry are almost nonexistent including the child and adolescent psychiatry. Therefore many patients who should be picked up by a child psychiatrist and treated for these conditions remain undiagnosed or under treated and presents in their adulthood to psychiatry clinics. Sometimes they present with some other comorbid psychiatric illness or primarily with the complaints of ADHD and ASD but are overlooked due to lack of knowledge of the treating psychiatrist. Our study appears to be first of its kind in our country to look for these disorders existing as comorbidity among the adult psychiatric patients. Previous studies done in other parts of the world have revealed a considerable percentage of adults facing these problems either alone or as comorbidity with other psychiatric diagnosis^{1,2,19}. Our results were not very different from these studies. More than 19% of our target population met the criteria either for ASD or ADHD. This percentage is quite alarming as this huge number of patients have been unrecognized in our set up. These disorders may have a common genetic predisposition with the other psychiatric disorders or sometimes a common neuro-chemical pathway may be responsible for the comorbidity^{19,20}. In order to make the study design simple and saving the consultants from interviewing every patient for these disorders, we screened them for these disorders on validated Urdu scales and only screening positive individuals were interviewed for the final diagnosis of ASD or ADHD.

As most of the patients included in our study comprised of neurotic illnesses that is depression and anxiety, so female predominance is not a

strange finding. Though males were less in number in the target population but still male gender was strongly associated with the presence of ADHD and ASD. This finding is in accordance with the existing literature^{20,21}. Reason of this finding may be genetic and chromosomal predisposition of males towards these disorders.

Low education was also a consistent correlate with presence of ASD and ADHD in our study. This association has been established in various settings in the past as well^{22,23}. Low education may be the cause or consequence of these symptoms. Usually it's a consequence as in child psychiatry studies it has been mentioned that children with ASD and ADHD are unable to achieve normal education milestones.

Past literature has proved the relationship of illicit substance use with the disorders like ASD and ADHD, especially ADHD^{24,25}. Results of our analysis were not different. Illicit substance use emerged as independent risk factor linked with presence of ADHD and ASD in the psychiatric patients of our study. They can contribute in the causality of the disorders as well as poor response to the treatment. Accurate history in the initial setting and good therapeutic alliance can be helpful in recognizing and treating this problem.

Poor response to the psychiatric treatment also has a strong correlation with presence of ADHD and ASD in our study. These have challenged the psychiatrist all over the world in the past as well²⁵. Presence of undiagnosed comorbidities like ADHD and ASD with other adult psychiatric illnesses may be a biological risk factor for the poor response to the treatment. These disorders may have psychosocial consequences which can contribute to noncompliance and retard the therapeutic process in these high risk individuals.

Despite a lot of strengths our study has a few limitations as well. It was carried out on the psychiatric patients of a tertiary care psychiatric facility so neither generalizable for the whole adult population nor for the psychiatric patients

as many psychiatric patients with less severe symptoms managed at primary and secondary care level would have been missed. Secondly biological screening was not done so these symptoms might be due to some organic pathology missed at the psychiatric clinics. Use of psychometric screening tools poses methodological issues as well as study participants may under report or over report symptoms on them. Moreover if final diagnosis has been made by one consultant psychiatrist and that too after blinding, results would have been more accurate. Large multi-center or community based studies in future with more sophisticated study design may generate more generalizable results.

CONCLUSION

This study showed a high prevalence of ASD and ADHD among the adult psychiatric patients of Pakistan reporting for the psychiatric evaluation at a tertiary care psychiatric facility. Special attention should be paid to the male and low education patients. Illicit substance use and poor response to treatment also emerged as independent risk factors linked with presence of ASD and ADHD among the adult psychiatric patients.

ACKNOWLEDGEMENT

Prof Babur Yusufi, Consultant Psychiatrist (Intellectual Disability), Honorary Senior Clinical Lecturer, University of Sheffield.

Ms Asma Nigar, Clinical Psychologist

Ms Tayyaba Fida Kiyani, Clinical Psychologist

Clinical Psychologists Batch 2018, Department of Behavioral Sciences, NUST.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. Katzman MA, Bilkey TS, Chokka PR, Fallu A, Klassen LJ. Adult ADHD and comorbid disorders: clinical implications of a dimensional approach. *BMC Psychiatry* 2017; 17: 302.
2. Louzolo A, Gustavsson P, Tigerstrom L, Ingvar M, Olsson A. Delusion-proneness displays comorbidity with traits of autistic-spectrum disorders and ADHD. *PLoS One* 2017; 12(5): e0177820.
3. Shattuck PT, Seltzer MM, Greenberg JS, Orsmond GI, Bolt D, Kring

4. S, et al. Change in autism symptoms and maladaptive behaviors in adolescents and adults with an autism spectrum disorder. *J Autism Dev Disord* 2007; 37(9): 1735-47.
5. Lyall K, Croen L, Daniels J. The Changing Epidemiology of Autism Spectrum Disorders. *Annu Rev Public Health* 2017; 38: 81-102.
6. Polyzoi M, Ahnemark E, Medin E, Ginsberg Y. Estimated prevalence and incidence of diagnosed ADHD and health care utilization in adults in Sweden - A longitudinal population-based register study. *Neuropsychiatr Dis Treat* 2018; 14: 1149-61.
7. Ståhlberg O, Anckarsäter MDPH, Rastam M. Bipolar disorder, schizophrenia, and other psychotic disorders in adults with childhood onset AD/HD and/or autism spectrum disorders 2004; 891-902.
8. Caye A, Rocha TB, Anselmi L, Murray J, Menezes AM, Barros FC. Attention-deficit/hyperactivity disorder trajectories from childhood to young adulthood: Evidence from a birth cohort supporting a late-onset syndrome. *JAMA Psychiatry* 2016; 73(7): 705-12.
9. Moffitt TE, Houts R, Asherson P, Belsky DW, Corcoran DL, Hammerle M, et al. Is Adult ADHD a Childhood-Onset Neurodevelopmental Disorder? Evidence From a Four-Decade Longitudinal Cohort Study. *Am J Psychiatry* 2015; 172(10): 967-77.
10. Agnew-Blais JC, Polanczyk GV, Danese A, Wertz J, Moffitt TE, Arseneault L. Evaluation of the Persistence, Remission, and Emergence of Attention-Deficit/Hyperactivity Disorder in Young Adulthood. *JAMA Psychiatry* 2016; 73(7): 713-20.
11. Sobanski E. Psychiatric comorbidity in adults with attention-deficit/hyperactivity disorder (ADHD). *Eur Arch Psychiatry Clin Neurosci* 2006; 256 (Suppl-1): i26-31.
12. Wilens TE, Morrison NR. Substance-use disorders in adolescents and adults with ADHD: focus on treatment. *Neuropsychiatry (London)* 2012; 2(4): 301-12.
13. Geffen J, Forster K. Treatment of adult ADHD: A clinical perspective. *Ther Adv Psychopharmacol* 2017; 8(1): 25-32.
14. Akhter M, Ashraf M, Ali A. Integration of therapies in autistic children; a survey based in Karachi, Pakistan. *J Pak Med Assoc* 2018; 68(10): 1508-12.
15. Anwar MS, Tahir M, Nusrat K, Khan MR. Knowledge, Awareness, and Perceptions Regarding Autism Among Parents in Karachi, Pakistan. *Cureus* 2018; 10(9): e3299.
16. Imran N. Attention Deficit Hyperactivity Syndrome: An update on assessment and management. *Pak J Med Sc* 2007; 23(1): 9-15.
17. Poverty and social safety nets. Chapter 15. *Pakistan economic survey* 2013-14.
18. https://www.autismresearchcentre.com/arc_tests
19. <https://www.hcp.med.harvard.edu/>
20. Polderman TJ, Hoekstra RA, Posthuma D, Larsson H. The co-occurrence of autistic and ADHD dimensions in adults: an etiological study in 17,770 twins. *Transl Psychiatry* 2014; 4(9): e435.
21. Tromans S, Chester V, Kiani R, Alexander R. The Prevalence of Autism Spectrum Disorders in Adult Psychiatric Inpatients: A Systematic Review. *Clin Pract Epidemiol Ment Health* 2018; 14: 177-187.
22. Solberg BS, Halmøy A, Engeland A, Igland J, Haavik J. Gender differences in psychiatric comorbidity: A population-based study of 40 000 adults with attention deficit hyperactivity disorder. *Acta Psychiatr Scand* 2017; 137(3): 176-186.
23. Werling DM, Geschwind DH. Sex differences in autism spectrum disorders. *Curr Opin Neurol* 2013; 26(2): 146-53.
24. Frank F, Jablotschkin M, Arthen T. Education and employment status of adults with autism spectrum disorders in Germany - A cross-sectional-survey. *BMC Psychiatry* 2018; 18(1): 75.
25. Brook JS, Brook DW, Zhang C, Seltzer N, Finch SJ. Adolescent ADHD and adult physical and mental health, work performance, and financial stress. *Pediatrics* 2013; 131(1): 5-13.
26. Butwicka A, Långström N, Larsson H. Increased Risk for Substance Use-Related Problems in Autism Spectrum Disorders: A Population-Based Cohort Study. *J Autism Dev Disord* 2016; 47(1): 80-89.