

CLINICAL PROFILES OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER ATTENDING MOSUL GENERAL HOSPITAL: CROSS SECTIONAL STUDY

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ABSTRACT

Background: Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder with a triad of symptom clusters: inattention, hyperactivity and impulsivity. Even though ADHD is classified as a childhood condition, a significant fraction of those affected continue to experience symptoms into their adulthood. **Objectives:** look at the age distribution, clinical characteristics, and sociodemographic profiles of ADHD patients Attending Mosul General Hospital in Mosul. **Methods:** An observational, descriptive, cross-sectional study. All patients with ADHD who attend psychiatric and paediatric consultation units of Mosul General Hospital between 10th of May 2022 to the end of June 2024 had been included. The Questionnaire was composed of two parts, the first included demographic information of the patients and the second the ADHD subtypes. **Results:** The study includes 200 subjects with ADHD, of them 133 (66.5%) males and 67 (33.5%) females. The study participants are distributed in two groups. Less than 9 years represent 111 (55.5%), while the age group of more than 9 which represent 89 (44.5%). ADHD is prevalent among 97 (47.5%) of lower middle class, followed by upper lower class among 55 (27.5%), then upper middle, lower and upper classes among 27 (13.5%), 18 (9%) and 3 (1.5%) respectively. The majority of patients were born at Autumn 77 (38.5%) and Spring 75 (37.5%). While only 33 (16.5%) are presented at Summer and only 15 (7.5%) patients are presented at Winter. ADHD Inattention subtype is prevalent among 79 (39.5%) while Hyperactive/impulsive subtypes are prevalent among 66 (33%) and combined subtype is prevalent among 55 (27.5%) respectively. **Conclusion:** Attention defect hyperactive disorder affects males more than females, Patients who are less than 9 years are affected with ADHD more than those of more than 9 years. Having lower middle and upper lower socio-economic states found to be more frequently affected by ADHD than other socio-economic states. inattention subtype is more prevalent than other subtypes of ADHD. More prospective studies are needed for this topic in future.

1- INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder with a triad of symptom clusters: inattention, hyperactivity and impulsivity.^[1] At least two settings must exhibit symptoms, to consider it seriously disrupt functioning and create distress.^[2] While the cutoff age of onset was previously set at 7 years old in the DSM-IV and the International Classification of Diseases (ICD-10), the Diagnostic and Statistical Manual (DSM-V) has modified this to be below 12 years old.^[3] Even though ADHD is classified as a childhood condition, a significant fraction of those affected continue to experience symptoms into their adulthood.^[4-5] ADHD is a serious public health issue. Among adolescents aged, ADHD is considered the third most common psychiatric illnesses worldwide in terms of disability-adjusted life years (DALY), behind anxiety and depressive disorders.^[6-7]

The term "hyperactivity-impulsivity" describes symptoms that are above and beyond what is typical for a person's age or developmental stage, such as high levels of overactivity, fidgeting, inability to sit still, interfering with other people's activities, and unwillingness to wait.^[8-9] But "inattention and disorganization refer to a lack of capacity to focus on tasks, appearing to not pay attention, and missing important materials for tasks, at levels that are inconsistent with one's age or developmental level."^[10] Numerous causes of ADHD have been identified by epidemiological studies, including genetic, neuroanatomical, neurochemical, and environmental factors.^[11-13] Studies using neuroimaging suggest that prefrontal-striatal circuitry plays a role in the etiology of ADHD. According to Barkley's most well-known theory, behavioral inhibition controls four cognitive executive functions: working memory, speech internalization, self-

regulation, and reconstitution.^[14] Deficits in these domains are thought to be the root cause of ADHD. The intellectual growth of children is essential for the future wellbeing.^[15] Unfortunately, the cognitive development of children with intellectual disability is delayed. In addition to cognitive delay, children with intellectual disabilities are more likely than the general population to experience emotional, behavioral, and mental issues.^[16] ADHD manifests in three primary subtypes: predominantly inattentive (ADHD-I), hyperactive/impulsive (ADHDHI), or a combination of both (ADHD-C).^[17] Understanding ADHD in childhood and adolescence requires a comprehensive approach that considers multiple factors, such as genetics, neuropsychology, cognition, and psychosocial dynamics. Familial history of ADHD, male gender, psychological stress or depression in the mother, and smoking and alcohol use during pregnancy are all recognized risk factors.^[18-19] Other variables that have been consistently linked to the problem include low birth weight, prenatal problems, thyroid abnormalities in the mother, and dietary patterns.^[20] The study aims to look at the age distribution, clinical characteristics, and sociodemographic profiles of ADHD patients Attending Mosul General Hospital in Mosul.

2- PATIENT AND METHODS

The study is confidential and did not include any information that might be used to identify a specific individual. Ethical approval was given by Nineveh Health Directorate. It is a an observational, descriptive, case series study. All patients with ADHA who attend psychiatric and Paediatric consultation unit of Mosul General Hospitals between 10th of May 2022 to the end of June 2024 had been included. The patients (less than 12 years) and their parents are face to face interviewed by the investigators to fill the questionnaire that been made especially for this purpose. Patients with intellectual disability or severe communication difficulties were excluded from the study. By using ICD-10 criteria and appropriate scales to diagnose patients with ADHD.^[21] The MINI International Neuropsychiatric

Interview was used to measure psychiatric comorbidity (MINI KID)^[22] The Vanderbilt ADHD diagnostic rating scale was used to evaluate the severity of ADHD symptoms and their subtypes, with a focus on three subtypes.^[23] A modified Kuppuswamy scale was utilized to ascertain socio-economic status, and a proforma was employed to gather socio-demographic characteristics. The total score of Kuppuswamy SES ranges from 3 to 29 and it classifies families into 5 groups, “upper class, upper middle class, lower middle class, upper lower and lower socio-economic class.”^[24] In addition to the clinical profile, age, gender, socio-economic state of patients’ parents is documented (more than 4000\$, 2000-4000\$, 500-2000\$, 200-500\$ and less than 200\$), season of the year at time of presentation is added.^[25] Version 26 of the SPSS (Statistical Package for Social Sciences) program was used to analyse the data (IBM Corporation, USA).

Table 1: Kuppuswamy socio-economic ranges.

Class	Score
Upper class	26-29
Upper middle class	16-25
Lower middle class	11-15
Upper lower class	5-10
Lower class	< 5

3- RESULTS

The Study includes 200 participants, of them 133 (66.5%) males and 67 (33.5%) females. The study participants are distributed in two groups. Less than 9 years represent 111 (55.5%), while the age group of more than 9 which represent 89 (44.5%). As shown in table 1 and figure 1.

Table 2: Distribution of study population according to the age and gender.

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
Less than 9	76	38	35	17.5	111	55.5
More than 9	57	28.5	32	16	89	44.5

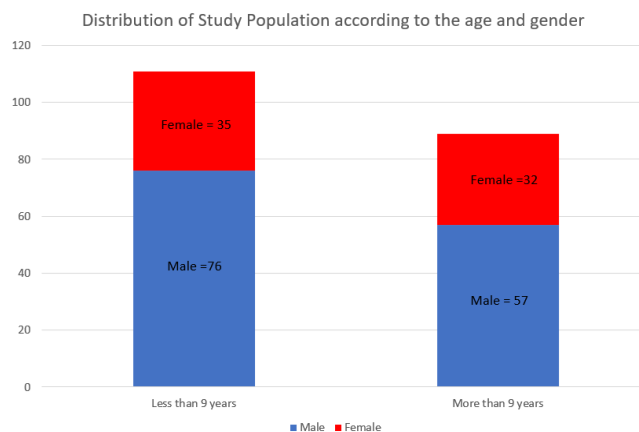


Figure 1: Distribution of study population according to the age and gender.

Table 3 show distribution of the study population according to socio-economic state. It's evident that ADHD is prevalent among 97 (47.5%) of lower middle class, followed by upper lower class among 55 (27.5%), then upper middle, lower and upper classes among 27 (13.5%), 18 (9%) and 3 (1.5%) respectively.

Table 3: Distribution of study population according to socio-economic states.

Socio-economic state	No.	%
Upper class	3	1.5
Upper middle class	27	13.5
Lower middle class	97	47.5
Upper lower class	55	27.5
Lower class	18	9
Total	200	100

Table 4 explores the distribution of the study population according to the season of birth of patients. The majority of patients were born at Autumn 77 (38.5%) and Spring 75 (37.5%). While only 33 (16.5%) are presented at Summer and only 15 (7.5%) patients are presented at Winter.

Table 4: Distribution of study population according to seasons of birth.

Season of the year	No.	%
Winter	15	7.5
Spring	75	37.5
Summer	33	16.5
Autumn	77	38.5
Total	200	100

Table 5 illustrates more details about ADHD subtypes, ADHD Inattention subtype is prevalent among 79 (39.5%) while Hyperactive/ impulsive subtypes are prevalent among 66 (33%) and combined subtype is prevalent among 55 (27.5%) respectively.

Table 4: Distribution of study population according to subtypes of ADHD.

Subtypes of ADHD	No.	%
ADHD Hyperactive/ impulsive subtype	66	33
ADHD Inattention subtype	79	39.5
ADHD Combined subtype	55	27.5
Total	200	100

4- DISCUSSION

The current study evaluated the gender and age distribution, clinical characteristics of ADHD patients in Mosul-Iraq.

In this study, the majority of patients are males (within both more and less than 9 years age groups), with a male-to-female ratio of approximately 1.98:1; this is in line with the consensus that males are more likely to be diagnosed with ADHD, with higher male-to-female

ratios found by Hassan Mirza et al from Oman^[26] and Alyx Taylor et al from China.^[27]

From the other hand; the age group of less than 9 years found to have more ADHD than the age groups of more than 9 years which is runs with Utkarsh Karki et al study finding.^[28]

Moreover; the study found the ADHD patients' parents with lower middle and upper lower socio-economic states are more prevalent than other socio-economic states which is parallel to study conducted at Kashmir by Malik et al⁰. Additionally; ADHD patients found in this study born more frequently at moderate and nice weather of Autumn and Spring season than cold and hot season of Winter and Summer respectively with is consistent with Azam Hamidzadeh et al study findings.^[29]

Regarding subtypes of ADHD, the study found that inattention subtype is more prevalent than hyperactive/ impulsive and combined subtypes which is comparable to a systematic review and meta-analysis conducted by Mohammad Al-Wardat et al at Middle East and North Africa region which was founded that from a sample of 461596 individuals with ADHD, the estimated proportions of the ADHD subtypes were 46.7% for attention deficit, 33.7% for hyperactivity/impulsivity and 20.6% for the combined subtypes.^[30]

Because Iraq has such a wide range of demographic and cultural characteristics, the study's primary limitation is how much it can be applied to other cities in the province of Iraq and, consequently, to the entire country. A nationwide studies concerning the prevalence, risk factors, signs, and symptoms of this condition, as well as its treatment across the country, is imperative in order to advance children's health, given the disorder's substantial impact on children's overall health. Another limitation is the relatively small sample size and the chance that children with milder symptoms of ADHD who may not have accessed the psychiatric of paediatric consultation units of Mosul General Hospital service might have been missed. Moreover; The study's scope is limited to presenting characteristics and demographics, without delving into the long-term outcomes, treatment responses, or potential changes in symptomatology over time. Lastly; the cross-sectional nature of the study prevents establishing causal relationships or understanding the dynamic trajectories of ADHD symptoms and presentations.

5- CONCLUSIONS AND RECOMMENDATIONS

Attention defect hyperactive disorder affects males more than females, Patients who are less than 9 years are affected with ADHD more than those of more than 9 years. Having lower middle and upper lower socio-economic states found to be more frequently affected by ADHD than other socio-economic states. inattention subtype is more prevalent than other subtypes of ADHD.

More prospective studies are needed for this topic in future.

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Conflict of interest

About this study, the authors disclose no conflicts of interest.

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