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Prevalence of Attention Deficit Hyperactivity among Children Attending Outpatient Clinic in Psychiatric Teaching Hospital in Erbil City

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Abstract
Background and objectives: Attention deficit hyperactivity disorder is one of the common psychiatric disorder in childhood and it affects on children socially and academically. The aim of this study is to find out the prevalence of Attention deficit hyperactivity disorder among the studied population, describe its association with certain socio-demographic characteristics, and to identify factors that might affect the disease.**Methods**: A cross sectional study conducted among 400 children aged more than six year attending outpatient clinic of Psychiatric Teaching Hospital in Erbil city, from the 1st of April 2015 to the 30th of April 2016. The questionnaire was completed through direct interview. A Chi square test of association was used to compare proportions. A P value of $\leq$ 0.05 was considered as statistically significant**Results:** The overall prevalence of Attention deficit hyperactivity disorder was 35 (8.75%). Among males 22 (9.2%) were had ADHD. The prevalence of ADHD was significantly associated with paternal and maternal high education (28.9%) and (24%) respectively. Among the medical diseases trauma and mental retardation showed significant association with the prevalence of the disease as they may have no role as a factor or as a cause of the disease. While family history of medical disease were positive in only 4 (7.8%). **Conclusion:** The prevalence of Attention deficit hyperactivity disorder was higher among boys. It showed significant association with higher educational level and higher socioeconomic status of the family.
Keywords: Attention Deficit Hyperactivity disorder, prevalence, Hawler psychiatric teaching hospital.

Introduction

Attention deficit hyperactivity disorder (ADHD) is characterized by inattentiveness, impulsivity, and over activity. It is possible to have one of these features without the other.[1,2] Behaviors of ADHD may overlap or coexist with other mental health conditions.[3]ADHD has long be recognized in children and for many the disorders persist into adulthood. There is a growing concern that the adult with ADHD who have the least favorable outcome, are among those who end with prison.[4] Genetic factor appear to play an important role. Extremely low birth weight (<1000 gram), and environmental conditions, such as head trauma and exposure to lead, are also associated with symptoms of ADHD.[3] Meta-analysis of candidate-gene association studies have shown strong association between ADHD and several genes involved in dopamine and serotonin pathways. There is evidence of a familial predisposition.[5,6]

The diagnosis of ADHD requires the identification of a specific behaviors that meet the criteria of the diagnostic and statistical manual of mental disorders, fourth edition, revised (DSM-IV-R),[3] Since certain medical conditions, psychological disorders, and stressful life events can cause symptoms that mimic ADD/ADHD.[7]The management of ADHD involves a comprehensive treatment program. There needs to be multi professional collaboration including the parents.[2] Drug treatment and dietary manipulation. The specific class of medication most commonly prescribed for ADHD is stimulants. like Ritalin (methylphenidate) or Adderall (an amphetamine) have few side effects.[8] include appetite suppression and weight loss, headaches, and mood effects.[9] As more information about ADHD accommodations becomes available, school professionals can support students with ADHD.[10]

Justification of study: As well as ADHD is relatively common condition among children, no study done before to elicit the extent of the problem in Erbil city. Children with ADHD develop emotional problems and poor school performance, which have bad impact on their future social life associated with unemployment, substance abuse, and even crime.

The aims of study to know the prevalence of ADHD among children who attend outpatient clinic in Psychiatric Teaching Hospital in Erbil city. Specific objectives to:

1. Find out the prevalence of ADHD among studied population.
2. Describe the association between ADHD and certain socio-demographic characteristics.

3. Identify factors that might affect the disease.

Patients & Methods:

Study design: Cross-sectional study design.

Study Setting, and duration:

This is a hospital-based study conducted at the outpatient clinic of Psychiatric teaching Hospital in Erbil city. The study period was from the 1st of April 2015 to the 1st of April 2016.

Sampling technique:

The estimated sample size was 384 and rounded to 400 patient calculated based on this formula[11]:

$$N= \frac{Z^2 * P(1-P)}{C^2}$$

N= required sample size

Z= confidence level of 95% which is equal to 1.96

p= estimated prevalence we have no previous study we do not know the prevalence hence we assume it as 50%

C= confidence interval at 5% equal to 0.05

$$N= \frac{1.96^2 * 0.5(1-0.5)}{0.05^2}$$

Inclusion criteria

Children aged six years and above was included in the study. DSM-IV criteria adapted for diagnosis of ADHD.[3]

Exclusion criteria: Age below six years and above 18 years.

Ethical consideration

The study proposal submitted to the Ethics Committee of the College of Medicine at Hawler Medical University and a facilitation letter from Erbil Directorate of Health (DOH) obtained. All participants informed about the study before giving a consent to participate. The information will be kept confidential and would not be used for other purpose.

Data collection

One to two visits per week was performed to the out- patient clinic of psychiatric teaching hospital in Erbil city, each visit 10-15 patients were taken. The interview has been done with parents or any caregiver and it lasts for about 10 minute.

The questionnaire

The data was collected by designing an appropriate questionnaire form constructed for this purpose and filled by the researcher through direct patient interview .

The questionnaires include:

- Socio-demographic data including (age, gender, socioeconomic status, educational status of parents) .
- Factors such as: birth weight and family history, history of trauma and the presence of other mental or psychiatric disorder .
- Antenatal problems, and drug history.

Statistical Analysis

For analyses, a statistical Package for Social Sciences (SPSS version 19) was used for data entry and data analysis. A chi square test used to find the significance of association between different factors. A P value of ≤ 0.05 was considered statistically significant.

Results

The mean age of patients was 8.8 ± 2.76 years, with minimum age 6 years and maximum 17 years. Table 1 shows that the prevalence (9.9%) among children aged 6-10 years was higher than the prevalence (6.9%) among children aged 11-15. None of those aged >15 years were affected (p=0.406).

Table 1: Association of age groups with ADHD, N=400

Age category	Not ADHD		ADHD		Total		P value
	Frequency	%	Frequency	%	Frequency	%	
6-10	274	90.1%	30	9.9%	304	100.0%	0.406
11-15	81	93.1%	5	6.9%	86	100.0%	
>15	10	100.0%	0	.0%	10	100.0%	
Total	365	91.25%	35	8.75%	400	100.0%	

As shown in Table 2, the prevalence of ADHD among the participants was 8.75%, which was the third after mental retardation (41%) and autism (10.5%) respectively.

Table 2: Frequency distribution of mental diseases N=400

Disorders	Frequency	Percent
Mental retardation	165	41.25
Enuresis	42	10.50
ADHD	35	8.75
Autism	30	7.50
Hyperactivity	26	6.50
Stuttering	19	4.75
Epilepsy	11	2.75
Low IQ	8	2.00
Depression	7	1.75
Behavioral disorder	6	1.50
CP	6	1.50
PTSD	6	1.50
Obsessive disorder	5	1.25
Schizophrenia	5	1.25
Learning disability	4	1.00
Poor attention	3	0.75
Psychosis	3	0.75
Aggression	2	0.50
Anxiety disorder	2	0.50
Conversional disorder	2	0.50
Phobia	2	0.50
Sexual abuse	2	0.50
Speech problem	2	0.50
Tampertantram	2	0.50
Bipolar disorder	1	0.25
Drug abuse	1	0.25
Panic disorder	1	0.25
School refusal	1	0.25
Trauma	1	0.25
Total	400	100

The gender variation showed (9.2%) of males had ADHD, while (8.1%) of females had ADHD. The highest prevalence of ADHD was among those with father and mother higher education, (28,9%) and (24%) respectively.

The most of ADHD cases 17 (19.1%) were from high socioeconomic status (SES) and 27 (11.8%) were from urban resident, while (22.6%) of the cases with preserved social structure were ADHD cases , as shown in Table 3.

Table 3: Association of socio-demographic features with ADHD, N=400.

Variables		Not ADHD		ADHD		Total		P value
		Frequency	%	Frequency	%	Frequency	%	
Gender	Male	217	90.8%	22	9.2%	239	100.0%	0.695
	Female	148	91.9%	13	8.1%	161	100.0%	
Father educ	Illiterate	88	97.8%	2	2.2%	90	100.0%	<0.001
	Read and write	67	94.4%	4	5.6%	71	100.0%	
	Primary school	86	93.5%	6	6.5%	92	100.0%	
	Intermediate and school	97	89%	12	11%	109	100.0%	
	Higher education	27	71.1%	11	28.9%	38	100.0%	
Mother edu	Illiterate	91	95.8%	4	4.2%	95	100.0%	0.007
	Read and write	69	97.2%	2	2.8%	71	100.0%	
	Primary school	103	88.8%	13	11.2%	116	100.0%	
	Intermediate and school	83	89.2%	10	10.8%	93	100.0%	
	Higher education	19	76%	6	24%	25	100.0%	
SES	Low	177	97.8%	4	2.2%	181	100.0%	<0.001
	Medium	116	89.2%	14	10.8%	130	100.0%	
	High	72	80.9%	17	19.1%	89	100.0%	
Residence	Urban	201	88.2%	27	11.8%	228	100.0%	0.012
	Rural	164	95.3%	8	4.7%	172	100.0%	
Social struc	Preserved	65	77.4%	19	22.6%	84	100.0%	<0.001
	Disturbed	300	94.9%	16	5.1%	316	100.0%	

Among all cases with ADHD, only one case had family history of ADHD (33.3%), while 5 (4.9%) had family history of psychological disease, and 4 (7.8%) had family history of medical disease, hence family history showed no significant association with the prevalence of ADHD, as shown in Table 4.

Table 4: Association of family history with ADHD, N=400

Family history		Not ADHD		ADHD		Total		P value
		Frequency	%	Frequency	%	Frequency	%	
Medical disease	**Yes**	47	92.2%	4	7.8%	51	100.0%	0.060
	No	318	91.1%	31	8.9%	349	100.0%	
ADHD	**Yes**	2	66.7%	1	33.3%	3	100.0%	0.130
	No	363	91.4%	34	8.6%	397	100.0%	
Psychological dis	**Yes**	97	95.1%	5	4.9%	102	100.0%	0.111
	No	268	89.9%	30	10.1%	298	100.0%	

Medical history of the ADHD revealed that 33 (8.7%) had birth weight > 2000 gm. History of trauma was positive in 2 (2.9%) of cases, while 14 (8.3%) of cases had history of medical disease. History of antenatal drug using was positive in 6 (10.7%) of cases, while 9 (4.5%) had history of mental retardation(learning disability), as shown in Table 5

Table 5: Association of medical history with ADHD, N=400

Variable		Not ADHD		ADHD		Total		P value
		Frequency	%	Frequency	%	Frequency	%	
Birth weight	**>2000 gm**	346	91.3%	33	8.4%	379	100.0%	0.385
	<2000 gm	19	90.5%	2	9.5%	21	100.0%	
History of trauma	**Yes**	68	97.1%	2	2.9%	70	100.0%	0.048
	No	297	90%	33	10%	330	100.0%	
Child history of me	**Yes**	155	91.7%	14	8.3%	169	100.0%	0.941
	No	210	90.9%	21	9.1%	231	100.0%	
Antenatal drug usin	**Yes**	50	89.3%	6	10.7%	56	100.0%	0.629
	No	315	91.6%	29	8.4%	344	100.0%	
Mental retardation	**Yes**	189	95.5%	9	4.5%	198	100.0%	0.003
	No	176	87.1%	26	12.9%	202	100.0%	

Discussion

Attention deficit hyperactivity disorder is a common psychiatric problem which should diagnosed and managed socially and academically.

DSM IV criteria was adapted for the diagnosis of ADHD. 400 participant of both male and female gender concluded in this study, their age was six years and above, whom attended the outpatient clinic in Hawler Teaching Hospital. The overall prevalence was 8.75%, which is near the prevalence of an Egyptian study done for pupils who attended a kindergarten and primary school in a public and a primary school in which the prevalence was 9.5%.[12] Another study done in Tabriz/Iran for primary school children, showed a prevalence of 9.7%[13] which was also near current study's result. In comparison with other study done in France for children age between 6-12 year, the prevalence of ADHD was 3.5% and 5.6%[14] which was even lower than present result. Other study carried among elementary school's children in Assiut city/Egypt, had shown a prevalence of 6%,[15]which is lower than current prevalence.

Several other studies showed a very higher prevalence such as a study done also in Egypt conducted on 600 children 5-12 years who attended the general pediatric outpatient clinic in which the prevalence of ADHD was 19.7%.[16] another study which was done in Saudi Arabia for male primary school children in Dammam city which showed the overall prevalence of ADHD 16.4%.[17] These variations may be due to some factors such as, cultural causes, the diagnoses and screening that depended and the sample size.

Despite the percentage of ADHD among boys were more than among girls in the current study but it showed no statistically significant association with ADHD's prevalence. This is may be due to the sample size and the population study. While the parent education was significantly associated with prevalence of ADHD, in which near one third of cases with parental higher education were ADHD cases (28.9%) for father education and (24%) for mother education. This result is similar to a study done in Egypt in which showed also high prevalence of ADHD cases with parental higher education (23.8%) and (20.9%) for paternal and maternal education respectively.[16]

The current study showed a higher proportion of ADHD among higher socio-economic status (19.1%) and urban resident (11.8%), in which it showed significant association with the ADHD's prevalence. A similar result found in a study hold in Saudi Arabia[17] which showed a higher proportion (54.4%) of ADHD among medium socio-economic status and inconsistent with the study done in Egypt which showed a significant association between the prevalence of ADHD with a low socio-economic status.[16] The same study from Egypt also showed higher ADHD prevalence in urban, similar to the current study's result.

In the present study, birth weight showed no significant association with ADHD's prevalence, this may be due to the limit edge of weight which chosen (2000 gm as a cut-point), while in other studies[5,6] in which significant association were observed, they put 2500gm as a cut-point. We put this limit weight depending on an information about factors affecting on ADHD disorder from an article in which it depends on a very low birth weight as a factor (≤ 1000 gm).[3] In our hospitals, very rarely a neonate live with this weight that is why we chose 2000gm as a cut-point to be compatible with our society.

History of trauma also showed a significant association with the prevalence of ADHD which revealed that history of trauma may have no role in the occurrence of the disease this is not due to the chance, and the same for mental retardation (learning disabilities), nine cases (4.5%) had mental retardation.

Conclusions

In conclusion, the overall prevalence of ADHD is 8.75% among children attended the outpatient clinic in Hawler Psychiatric Hospital. The mean age was 8.8 years ± 2.76, with minimum age 6 years and maximum age 17 years. ADHD's prevalence is significantly associated with some socio-demographic features like paternal and maternal education, high socioeconomic status, and urban resident. Also significant association was found with history of trauma and mental retardation, while it showed no significant association with family history of ADHD, psychological disease, and medical disease.

Conflicts of interest

The author reports no conflicts of interest.

Recommendations

- Parents, teachers, health care services, and the community should work to prepare a correct environment for children in their developmental stages.
- Advise for further studies to take larger sample size and a more detailed questionnaire to detect more factors that affect the disorder

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Reference

1. Lipsky MS, Mitchell S. King Family Medicine, Blue Prints, 3rd ed. Philadelphia: Lippincott Williams and Wilkins; 2011. P. 239.
2. Beattie RM, Champion MP. Essential revision notes in pediatrics for the MRCPCH, 2nd ed. Parkgate Estate: Egerton court; 2006: P. 91.
3. Rappley MD. Attention Deficit-Hyperactivity Disorder. N Engl J Med 2005; 352 : 165-75. [cited on Feb 6 2015] Available from: (WWW.NEJM.org).
4. Rasmussen K, Almvik R, Levender S. ADHD, Reading disability, and personality disorders in prison population. J Am Acard psychiatry Law 2001; 29 (2):186-93 [cited on Dec 15 2015].
5. Heidi MF, Michael IR, Attention Deficit-Hyperactivity Disorder in Children and Adolescents. N Engl J Med 2014; 370: 838-846. [cited on March 9 2015] Available from: (WWW.NEJM.org).
6. Peter H, Alan J, Pedro M, Benedetto V, John AM, James AM, et al. Attention Deficit- Hyperactivity Disorder in People with Generalized Resistance to Thyroid Hormone. N Engl J Med 1993; 328:997. [cited on March 9 2015] Available from; (WWW.NEJM.org).
7. Melinda S, Lawrence R, Jeanne S. ADHD in children: (Internet) last updated August 2015. Available from: (http://www.HELPGUIDE.ORG/articles/ADD-ADHD).
8. Martin B. Treatment for Attention Deficit Disorder (ADHD): (Internet) last reviewed : By John MG, Psych.D. On 6 Oct 2015. Available from
(http://WWW.Psych central.com/lib/treatment for Attention Deficit Disorder(ADHD).
9. Stephen MD. Attention Deficit Hyperactivity Disorder (ADHD) treatment & management: (Internet) Updated Apr 07, 2016; Available from: (http://emedicine.medscape.com/article/treatment of ADHD).
10. Achterberg RS. Attention Deficit Hyperactivity Disorder (ADHD) in schools: strategies for teachers and school counselors (master thesis): Menomonie, WI: university of Wisconsin- stout; Dec 2008. Available from: (http://adhd.org.sa).
11. Naing L, Winn T, Rusli BN. Practical Issues in Calculating the Sample Size for Prevalence Studies. Archives of Orofacial Science 2006; 1: 9-14.
12. Farid MN, Sabbour SM, Osman MH. Prevalence and risk factors of Attention Deficit Hyperactivity among school children. The Egyptian Journal of Community Medicine 2008; 26: 13-23. Available from: (http://article-sciencepublishinggroup.com/pdf).
13. Amiri S, Fakhari A, Maheri M, Mohammed A. Attention deficit/hyperactivity disorder in primary school children of Tabriz, North-West Iran. Pediatric periapt Epidemiol 2010; 24: 597-601. Available from: (http://article-sciencepublishinggroup.com/pdf).
14. Lecendreux M, Konofal E, Faraone SV. Prevalence of Attention Deficit Hyperactivity disorder and associated features among children in France. J Atten Disord 2011; 15: 516-24. Available from: (http://www.ncbi.nlm.nih.gov/pubmed).

15. El-Tallawy HN, Hassan WH, El-Behary A, Shehata GA. Prevalence of Attention Deficit Hyperactivity Disorder Among Elementary Schools Children in Assiut City-Egypt. Egypt J. Neurol. Psychiat. Neurosurg 2005; 42:517-26. Available from: (http://www.ejnpn.org/article).
16. El-Nemr FM, Badr HS, Salem MS. Prevalence of Attention Deficit Hyperactivity disorder in Children. Science Journal of Public Health 2015; 3: 274-80. Available from: (http://article-sciencepublishinggroup.com).
17. Al-Hamed HJ, Taha AZ, Bella H. Attention Deficit Hyperactivity disorder (ADHD) among Male Primary School Children in Dammam, Saudi Arabia : Prevalence and Associated Factors. J Egypt Public Health Assoc 2008; 83: 165-82. Available from: (http://adhd.org.sa).