

Epidemiological Aspects of Attention Deficit Hyperactivity Disorder among pupils in Al-Hilla City – Babylon Province –Iraq

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Abstract

Background: Attention Deficit Hyperactivity disorder was an important issue of mental health and welfare affecting pupils at the primary school specially in conflict affected areas including Iraq.

Objectives: To identify the prevalence and the epidemiological profile of ADHD among pupils in Al-Hilla city –Babylon province/Iraq.

Methodology: This was a cross sectional study which was conducted in 4 randomly selected groups by lottery , the pupils at the primary schools located in AL-Hilla city center, the study was conducted during the academic year 2016-2017 , 100 children were randomly selected from the first three primary school grades. A structured questionnaire was used to assess the behavior of pupils by both teachers and parents after obtaining their verbal consents. The questionnaire was designed according to the formula of diagnostic criteria of attention deficit and hyperactivity disorders used by American Academy of Pediatrics.

Results: The overall prevalence of ADHD in the study group was 14%,.The male to female ratio was 3.5:1, there was a highly significant association between this disorder and the presence of family history of this health problem $p<0.001$, parents tobacco smoking habit was significantly associated with the presence of attention deficit hyperactivity disorder among their children (the combined type) $p<0.05$, there was significant relationship between poor school achievement and this behavioral problem $p<0.05$.

In conclusion, ADHD is an important health problem among pupils in Hilla city . Intervention should be made to improve health care providers and teachers' knowledge about this problem and control the modifiable risk factors.

Keywords: Attention Deficit Hyper activity Disorder , prevalence, primary school children, Babylon province

Introduction

Attention deficit/hyperactivity disorder is defined as one of the neuropsychiatric disorder occurred among children ¹. The neurodevelopmental process of childhood-onset is mostly attacked by this disorder, leading to induce the neurodevelopmental disorder among them ². Symptoms usually take place before 7 years of age , this disorder varies in prevalence in different countries. The nature for these discrepancies

across different countries is unknown. However, the differences in terms of demographical, cultural aspects and parameters used for the diagnosis in the studied countries could partially explain this . Pervious research indicated that the prevalence for this disorder was ranged from 5.4%-8.7% in most of African countries ⁴, however, 3.2% in Nigerian community ³. This trend of variations was also found in another continent like Asia. In one of the epidemiological studies conducted in Iran mention prevalence 13%, while (2.7%) among the pupils in Saudi Arabia ⁵. Results also came from a comprehensive study that was included 21 different countries demonstrated that the children who were from Japanese and Finnish populations had the lowest scores, while the score was

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the highest among those from Jamaica and Thailand ⁶. In general, the symptoms for ADHD may be decreased when the person get older ⁷. This could be stemmed from the fact that the self-control and neural connections in the brain are seen to be more developed and less influenced during puberty ⁸. Many environmental factors and other factors like life style, mother's smoking during pregnancy or an early life of childhood, stress among pregnant, and low birth weight (<1.5kg) have been implicated with incidence of ADHD. Moreover, other medical problems such as hypoxemia, encephalitis, trauma, and brain injury could increase the incidence of ADHD ⁹. There was also a considerable evidence from a study that indicated that the incidence of ADHD was higher among first-degree family members of ADHD, suggesting that this disorder could be the most genetic psychiatric disorder ¹⁰. A study conducted in Jordan revealed that teachers perception was medium, no significant differences based on specialization and years of teaching experience, and suggests the importance of training teachers on enhancing their knowledge to identify students with attention deficit hyperactivity disorders ¹¹. A recent study conducted in Iraq shows that there is an association between computer-based video games, or mobile device use and behavioral changes like hyperactivity, attention deficit disorder among Iraqi children in Diyala province ¹². Studies showed that more difficult children are likely to be particularly vulnerable to higher levels of media exposure ^{13,14}, few studies were conducted in Iraq about the ADHD problem that affecting children and adolescent ¹⁵. ADHD children are more likely to have nocturnal enuresis, daily injuries, poor school performance and sleep problems ¹⁶. A study indicated that the drug abuse among adults was found to be linked with the cases of ADHD ¹⁷. This study was carried out to identify the prevalence and the epidemiological profile of ADHD Iraqi children at Al-Hilla city –Babylon province.

Methodology

One hundred primary school- age children were randomly selected by systematic random technique {50 males and 50 females), from four primary schools which were selected by simple random sampling from 48 elementary schools in Al Hilla city - Babylon province during the academic year 2016-2017. A random sampling was used among all students from grade 1 to 3 in the 4 elementary schools A structured questionnaire was used to assess the behavior of school children by both teachers and parents after obtaining

their verbal consents. The questionnaire was translated into Arabic language by 3 well known translators. This questionnaire was designed according to the formula of diagnostic criteria of attention deficit and hyperactivity disorders used by American Academy of Pediatrics (AAP).

The questionnaire included 18 items ; 9 of them are for information about attention deficit disorder and the other 9 are for information about hyperactivity and impulsivity disorders. Each item has 4 grades : nil – sometimes – usually – always. The way used in dealing with the data in the questionnaire is by giving score for each grade such as 1 ; 2 ; 3 ; 4 respectively and the diagnosis is made when the marks of child score for each type of the disorder is equal to or more than 22.5 marks. The child was considered as ADHD pupil when diagnosed by both teachers and parents for each type :attention deficit , hyperactive or both (combined). School children were considered as low school performing when they fail one academic year or more according to teachers and school records. Regarding tobacco smoking , smoker are those who currently smoke more than five cigarettes per day or at least one water pipe per week, while nonsmokers are those who never smoke or had quitted smoking since two years from the time of the study. Descriptive and inferential statistical analysis were applied using statistical package for social science (SPSS).Chi square test was used to assess the statistical difference between variables, $p < 0.05$ was considered as a level of statistical significance.

Results

Table (1) shows that the overall prevalence of ADHD among elementary school children in their early year is 14%,the males are highly predominant 22%. The male to female ratio is 3.5:1. Table (2) explains that this behavioral problem is more common in young age (7 years) and less among older children but this difference does not reach significant level , chi-square is 2.8251. The p -value is .243527. The result is *not* significant $p > .05$. Table (3) reveals that there is a statistically significant association between parents tobacco smoking habit and having children with ADHD problem $p < 0.05$. Table (4) depicts the very high significant statistical association between ADHD and the presence of positive family history of this behavioral problem among Iraqi children

Chi square= 34.9045 df=1 $p < 0.001$.

Table (5) shows that there is a statistically significant association between poor school achievement and development of attention deficit hyper activity disorder among the study group $p < 0.05$.

Table 1 (Distribution of ADHD among the study group by gender

Gender	Healthy NO (%)	ADHD NO (%)	Total NO (%)
Male	39 (78)	11 (22)	50 (100)
Female	47 (94)	3 (6)	50 (100)
Total	86 (86)	14 (14)	100 (100%)

* Chi square value = 5.34

* df = 1

* $p < 0.005$

Table (2) Frequency distribution of school children with ADHD by age

Age (Years)	Numbers of pupils	Number of (ADHD) pupils	Percentage
7	35	8	57
8	35	4	29
9	30	2	14
Total	100	14	100

The chi-square statistic is 2.8251. The p -value is .243527. The result is *not* significant $p > .05$.

* df = 2

Table (3) frequency distribution of the study group according to parents smoking habits.

Smoking of the parents (fathers)	ADHD NO (%)	Healthy children NO (%)	Total NO (%)
Smoking Positive	10 (71)	31 (36)	41 (41)
Smoking negative	4 (29)	55 (64)	59 (59)
Total	14 (100)	86 (100)	100 (100)

*Chi square = 6.231

* df=1

* p<0.05

Table (4) frequency distribution of family history of ADHD and normal school children.

Family history	ADHD NO (%)	Healthy NO (%)	Total NO (%)
Positive	11 (79)	9 (10.5)	20 (20)
Negative	3 (21)	77 (89.5)	80 (80)
Total	14 (100)	86 (100)	100 (100)

* Chi square= 34.9045

* df=1

* p<0.001

Table 5 - Frequency distribution of school children with ADHD and their school performance .

School performance	ADHD NO (%)	Healthy NO (%)	Total NO (%)
Low school performance	8 (57)	16 (18)	24 (24)
Normal	6 (43)	70 (82)	76 (76)
Total	14 (100)	86 (100)	100 (100)

* Chi square=9.8036

* df=1

* p<0.05

Discussion

The overall prevalence of ADHD (combined type) among school children in early years in the current study was 14%. This prevalence was less than that reported by other study conducted on Iranian children of the same age group in which the incidence was 25.8% when the parents' evaluation was considered, while it was when their teacher's evaluation was taken into account.¹⁸ The prevalence of this study is higher than that observed in pupils ranged between 6 until 12 years old in AL-Saudi Arabia (11.6%)¹⁹. and higher than the prevalence

reported in Egypt (12.6%) which was measured among children in four primary schools in AL- Mansura province²⁰. And even lesser than that reported that among primary school children in Egypt which was reported to be 6.9%²¹ ADHD is more prevalent in male children in this study with ratio 3.5:1.

This finding was in the line with previous studies²¹⁻²⁴. The study reveals that there is a significant association between having ADHD problem and positive family history, ADHD is a condition that results from the interaction among three premises, namely, genetic, environment, and developmental traits. However, the genetic promise could cover most of the cases²⁵. A relationship is identified between ADHD and parents tobacco smoking habits this finding depicts the possible role of the environmental pollution. A study reported the

role of Research indicated that mother's smoking during pregnancy or an early life of childhood had increased the incidence of ADHD for a child¹¹. In addition, a study indicated that the born girls who were exposed to nicotine in their prenatal life had higher chances to develop hyperactivity and/or impulsivity symptoms^{26,27}

Zhu and his colleagues demonstrates that the born babies came from smoker mums and non-smoker dads had higher risk of ADHD than those came from the vice-versa, highlighting the role of mother's smoking in the development of ADHD²⁸. The adverse effects of tobacco smoke could be derived from their ingredients that are accounted to be more than four hundreds molecules. Nicotine is among them that was shown to be closely related in the neurodevelopmental disorder²⁹ De Zeeuw et al³⁰ investigated the brain volumes using the imagining scan from anatomic magnetic resonance indicated that the patients with ADHD that was prenatally exposed to the smoking from their mums had smaller cerebellum volume compared to those had no smoking .This study shows a significant association between poor school achievement and having Attention Deficit Hyperactivity Disorder this may be related to poor attention, this finding goes in line with findings of other researchers who explain many reasons for poor school achievement. Good education could be one of the effective approaches that enhance the development of our children. In addition, Schools with poor educational programmers do not only influence on our child's self-esteem, but it could increase the stress of the child's parents³¹

Conclusions

the findings of this study indicated that the prevalence of ADHD is relatively high ; it is associated with low school performance , ADHD is more prevalent in boys, the prevalence is high among children with positive family history of this disorder and those whom parents are tobacco smokers therefore, considering the importance of students' mental health, the urgent needs of early diagnosis, effective prevention and management at least of high risk group, training of teachers and school health staff using a bottom line approach(District Team Problem Solving approach), Further comprehensive large scale analytic studies are suggested to deal with this neglected mental health problem. A close collaboration between schools' authorities and parents is recommendable, and the early diagnosis is crucial.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon – Hammurabi College of Medicine, Iraq and all experiments were carried out in accordance with approved guidelines.

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