Abstract

**Background:** ADHD is an early onset, highly prevalent neurobehavioral disorder, with genetic, environmental and biological etiologies that persist into adolescence and adulthood in a sizable majority of afflicted children and adolescents. It is characterized by inattention, hyperactivity, and impulsivity across the life cycle and is associated with considerable morbidity and disability.

**Objective:** To study the most prevalent psychiatric disorders affecting children and adolescents during 5 years from 2008 to 2012 attending special needs center, and to estimate the prevalence of ADHD cases among psychiatric disorders.

**Methodology:** Retrospective study (phase one). Prospective study (phase two). Group (A): 25 newly diagnosed cases of ADHD receiving behavioral therapy and stimulant medication (methylphenidate capsules with a total dose of 1 mg/kg/day) in the form of long acting capsules. The total dose was between (20-60) mg. Group (B): 25 cases of ADHD receiving behavioral therapy and non stimulant medications (atomoxetine capsules with a total dose of 1 mg/kg/day). All children in this study were subjected to: Full history taking and thorough clinical examination. IQ level Stanford-Binet Intelligence Scales V (SB 5), Conners Rating Scales Conners Parent Rating Scale-Revised- Long Version (CPRS-R: L). A written consent were obtained from the special needs center to record the data. Secrecy and privacy of patient's data.

**Results:** The prevalence rate of ADHD with total number of 10800 children was 10.2%. Methylphenidate (Group A) is more effective than atomoxetine (Group B) as regard hyperactivity (P = 0.025), impulsivity (P = 0.002) and learning disability (P = 0.018). There are positive correlations between hyperactivity versus learning disability and anxiety versus psychosomatic disorder. There was no significant statistical difference between both groups as regard total IQ and different IQ items.

**Conclusion:** Atomoxetine [non stimulant] is effective in management of ADHD symptoms especially inattention. But its efficacy in management of impulsivity and hyperactivity is less than stimulant drug (methylphenidate).

**Keywords:** Psychiatric, Children, Risk factors, Prevalence, ADHD, Atomoxetine, Methylphenidate.
Introduction:
ADHD is a disorder that manifests in childhood with symptoms of hyperactivity, impulsivity, and/or inattention. This disorder affects cognitive, academic, behavioral, emotional, and social functioning. The prevalence of ADHD in children varies from 2 to 18 percent depending upon the diagnostic criteria and the population studied. The prevalence rate in school-age children is estimated to be between 8 and 10 percent, making it one of the most common disorders of childhood (Poyler et al., 2011).

ADHD is an early onset, highly prevalent neurobehavioral disorder with genetic, environmental and biological etiologies that persist into adolescence and adulthood in a sizeable majority of affected children and adolescents of both sexes (Nijmeijer et al., 2008). It is characterized by behavioral symptoms of inattention, hyperactivity and impulsivity across the life cycle and is associated with considerable morbidity and disability (Spencer et al., 2007).

Objective:
The aim of the present study is to study the most prevalent psychiatric disorders affecting children and adolescents during 5 years from 2008 to 2012 attending special needs center and estimate the prevalence of ADHD cases among psychiatric disorders and Comparison of two lines of management of ADHD.

Methodology:
Retrospective study (phase one), Prospective study (phase two).

The present study is a clinical trial randomized study that was conducted on 50 patients who were following up at the outpatient clinics of center of special needs, Faculty of Postgraduate Childhood Studies, Ain Shams University. By the standardized psychiatric evaluation they were diagnosed as ADHD according to DSM V.

The studied children were divided into two main groups:

* Group (A): newly diagnosed cases of ADHD receiving behavioral therapy and stimulant medication (methylphenidate capsules with a total dose of 1mg/kg/day in the form of long acting capsules. The total dose was between (20-60) mg.

* Group (B): cases of ADHD receiving behavioral therapy and non stimulant medications (atomoxetine capsules with a total dose of 1mg/kg/day).

All children in this study were subjected to:
1. Full history taking and thorough clinical examination
2. IQ level Stanford-Binet Intelligence Scales V (SB 5).
3. Conners Rating Scales Conners Parent Rating Scale-Revised. Long Version (CPRSR: L) to assess the severity of symptoms of ADHD as reported by parents (El Sheikh et al., 2003).

Statistical Methods:
Data was collected, tabulated and statistically analyzed using SPSS package version 12.0. (SPSS, 2011).

Ethical Aspects:
A written consent were obtained from the special needs center to use the recorded data. Secrecy and privacy of patient’s data.

Results:
Table (1) shows that ADHD is prevalent among Egyptian children and its prevalence rate is 10.2% among studied population.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Percentage</th>
<th>No. Of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>F80: Specific developmental disorders of speech and language</td>
<td>23.5</td>
<td>2538</td>
</tr>
<tr>
<td>G80: Infantile Cerebral Palsy</td>
<td>17.3</td>
<td>1873</td>
</tr>
<tr>
<td>F90: ADHD</td>
<td>10.2</td>
<td>1101</td>
</tr>
<tr>
<td>F81: Specific developmental disorders of scholastic skills</td>
<td>8</td>
<td>871</td>
</tr>
<tr>
<td>R42: Deliberate Misuse in Childhood</td>
<td>4.9</td>
<td>333</td>
</tr>
<tr>
<td>R45.6: Violent behavior</td>
<td>4.85</td>
<td>524</td>
</tr>
<tr>
<td>Q90: Down Syndrome</td>
<td>3.6</td>
<td>390</td>
</tr>
<tr>
<td>G93.0: Other disorders of brain</td>
<td>3.2</td>
<td>350</td>
</tr>
<tr>
<td>R41.83: Borderline intellectual functioning</td>
<td>3.1</td>
<td>345</td>
</tr>
<tr>
<td>F84.9: Pervasive developmental disorder, unspecified</td>
<td>3</td>
<td>326</td>
</tr>
</tbody>
</table>

Table (2) shows that there were significant statistical difference between both groups as regard hyperactivity, impulsivity and learning disability. This means that methylphenidate is more effective than atomoxetine as regard these items.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>SE</th>
<th>T-Test</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct Disorder</td>
<td>Group 1</td>
<td>25</td>
<td>51.32</td>
<td>6.653</td>
<td>1.211</td>
<td>-4.98</td>
<td>0.001*</td>
</tr>
<tr>
<td></td>
<td>Group 2</td>
<td>25</td>
<td>52.36</td>
<td>8.504</td>
<td>1.701</td>
<td>2.45</td>
<td>0.018*</td>
</tr>
<tr>
<td></td>
<td>Group 3</td>
<td>25</td>
<td>51.04</td>
<td>5.209</td>
<td>1.040</td>
<td>-2.45</td>
<td>0.018*</td>
</tr>
<tr>
<td></td>
<td>Group 4</td>
<td>25</td>
<td>54.48</td>
<td>4.709</td>
<td>0.92</td>
<td>-2.45</td>
<td>0.018*</td>
</tr>
<tr>
<td></td>
<td>Group 5</td>
<td>25</td>
<td>41.84</td>
<td>3.363</td>
<td>0.673</td>
<td>6.61</td>
<td>0.522</td>
</tr>
<tr>
<td>Conners Psychomotor</td>
<td>Group 1</td>
<td>25</td>
<td>42.72</td>
<td>5.748</td>
<td>1.150</td>
<td>3.28</td>
<td>0.002*</td>
</tr>
<tr>
<td></td>
<td>Group 2</td>
<td>25</td>
<td>49.68</td>
<td>6.774</td>
<td>1.335</td>
<td>-3.28</td>
<td>0.002*</td>
</tr>
<tr>
<td></td>
<td>Group 3</td>
<td>25</td>
<td>53.32</td>
<td>5.266</td>
<td>1.653</td>
<td>-3.28</td>
<td>0.002*</td>
</tr>
<tr>
<td></td>
<td>Group 4</td>
<td>25</td>
<td>48.20</td>
<td>9.014</td>
<td>1.830</td>
<td>0.551</td>
<td>0.594</td>
</tr>
<tr>
<td></td>
<td>Group 5</td>
<td>25</td>
<td>50.86</td>
<td>4.247</td>
<td>0.840</td>
<td>-2.31</td>
<td>0.023*</td>
</tr>
</tbody>
</table>

There are positive correlations between hyperactivity versus learning disability and anxiety versus psychomotor disorder.

Discussion:
The prevalence of ADHD in the studied population including 10,800 children was 10.2%. The estimated prevalence of 10.2% is in accordance with reported prevalence of 2 to 14% among school-age children from other parts of the world (5chul & Schwab-Stone, 2000). Similar rates were reported by Visser et al. (2007) among US youth aged 4 to 17 years (7.8%), by O'Leary et al. (1985) in Italy (7.6%), by Andres-Cascosse et al. (1995) in Spain (8.0%).

The prevalence of ADHD in a sample of primary school children was 8.7% in Nigeria, 9.4% in Qatar and 10.15% in Venezuela (Adewuya & Famuyiwa, 2007; Brenner et al., 2006). However, it was found to be higher than that of Karhani et al. (1989) of 2.9% among 4811 candidates aged 12 years old.

The ADHD prevalence rate was 3.3% reported by Breton et al. (1999) on a (6-14). Guillemette et al. (2007) studied meta analysis of 171756 subjects from all world regions were included resulting in the ADHD...
worldwide-pooled prevalence of 5.29%.

In this study the mean age of diagnosed cases was 9.45 years which is similar to that reported by Froehlich et al. (2007). Similar results by Bauermeister et al. (2007) among children aged 4 to 11 in a representative community sample (N = 1896) in Puerto Rico which resulted a mean age of diagnosed cases to be 10.5 years.

The mean IQ of the diagnosed cases of ADHD was within average namely 97.1 for phase (1) and 96.6. These results are similar to Kevin Antshel et al. (2006) who concluded that ADHD children are within the province of normal IQ.

Stimulants are the first line treatment for ADHD and include methylphenidate and amphetamines. (Pliszka, 2007). Both types of stimulants block the reuptake of DA and norepinephrine (NE) into the presynaptic neuron, and amphetamines also promote the release of DA and NE into the extraneuronal space. Atomoxetine, an FDA-approved, non-stimulant, second-line medication for ADHD, blocks the NE transporter, which also takes up DA in the prefrontal cortex (PFC), thus increasing concentration of DA and NE in the PFC. Other non-stimulant agents approved for ADHD include the alpha 2-adrenergic agonists, clonidine and gufetamine, which mimic the effect of NE on alpha 2-adrenergic receptors in the PFC (Prince, 2008).

Our study revealed that Atomoxetine (non-stimulant) is effective in management of ADHD symptoms especially inattention. But its efficacy in management of impulsivity and hyperactivity is less than stimulant drug (Methylphenidate).

Conclusion:
ADHD is a highly prevalent disorder in children in Egyptian population. The prevalence rate in a community based sample reaching 10.2%. The IQ of the ADHD affected subjects was within the normal range in both the community based sample and the clinic oriented sample. Atomoxetine (non-stimulant) is effective in management of ADHD symptoms especially inattention. But its efficacy in management of impulsivity and hyperactivity is less than stimulant drug (Methylphenidate).

References:

(Common Childhood Psychiatric Disorders...