Nocturnal Enuresis Among Overweight Children

ZEINAB BAKRY, M.D. 1; ABD EL-HADY ABBAS, Ph.D. 2; ASMAA MAHMOUD, Ph.D. 3 and GULSEN SALEH, M.D. 4

The Departments of Pediatrics, Clinical Nutrition 1; Child Health & Nutrition and Head of Children Growth Unit2; Childhood Studies, Clinical Nutrition 3 and Community Medicine 4, National Nutrition Institute, Cairo, Egypt.

Abstract

Overweight continues to be a leading public health concern all over the world. Some studies showed a positive relationship between body mass index and different urological disorders. Other showed that obesity correlates with a lower voiding diary completion rate and lower efficacy of treatment in children with nocturnal enuresis or dysfunctional voiding.

This study was based on an observation that many overweight children who were attending the National Nutrition Institute (NNI) childhood obesity clinic were suffering from nocturnal enuresis. This work was designed to evaluate the relationship between overweight and nocturnal enuresis.

The study comprised 114 children aged 4 to 12 years, 53 overweight and 61 non-overweight children as a control group. Anthropometric measures were achieved in the form of weight and height. Body mass index was calculated. Medical history was taken carefully in details and children with primary enuresis were excluded from the study.

Children were clinically examined; those with genetic or endocrinal abnormalities, as well as, those who were suffering from psychological disorders were excluded from the study. Statistical analysis was done using SPSS statistical package version 13.

Our results revealed that 13 (24.5%) of the overweight children (above +2 SD BMI/age) suffered from nocturnal enuresis, compared to 6 (9.8%) of the normal weight children (below +2 SD BMI/age and above −2 SD BMI/age). The difference was statistically significant Chi (1) = 4.41 and p value = 0.032.

We recommend that nocturnal enuresis management should consider life style changes including weight reduction and different sport activities.

Key Words: Nocturnal enuresis – Nutrition – Overweight – Obesity – Children – Urological disorders.

Introduction

ACCORDING to the National Center for Health Statistics in USA, about 34% of children and adolescents are overweight or obese. Childhood obesity is not only a cosmetic problem, but also, a serious health problem facing our children. The prevalence of obesity has increased at an epidemic rate and obesity has become one of the most common health concerns in both developed and developing countries [1].

In Egypt, the report of National Nutrition Institute (NNI) in 2004 revealed that 5.6% of preschool (2-6 years) and 8.2% of school age children (6-12 years) were obese or overweight [2].

Many of the complications of obesity are seen in children, including fatty liver disease, gallstones, hyperlipidemia, insulin resistance and type 2 diabetes. Sleep apnea, psychological problems and nocturnal enuresis were strangely observed [3].

This study was designed to evaluate the relationship between overweight and nocturnal enuresis.

Material and Methods

A total of about 114 overweight and non–overweight children of both sexes aged 4 to 12 years, who attended the outpatient pediatric clinic of the National Nutrition Institute were examined. Children with primary enuresis due to any genetic or endocrinal cause were excluded. In addition, children with secondary enuresis due to psychological causes were also excluded.

The study was concerned with secondary nocturnal enuresis only i.e. after the child went through an extended period of dryness at night, approximately 6 months or more.

The examined children were subjected to medical history questionnaire stressing on symptoms of nocturnal enuresis, as well as, a psychiatric
questionnaire. Laboratory investigations included urine analysis, renal functions and blood glucose level (fasting and 2 hours post-prandial).

Weight and height were measured for all the studied children according to the procedures described by Jelliffe et al. [4]. BMI were calculated and plotted on BMI for age and sex specific percentiles using Anthro software 3.0.1. Children were classified into 2 groups; overweight (above +2 SD BMI/age) and normal "control" group (below +2 SD BMI/age and above -2 SD BMI/age).

**Statistical analysis:**

Statistical analysis was performed in the form of descriptive statistics using SPSS statistical analysis program (Version 13).

**Results**

Among a total number of 114 examined children of both sexes, there was 53 overweight children (above +2 SD BMI/age) representing 46.5%, compared to 61 of normal "control" children (below +2 SD BMI/age and above –2 SD BMI/age) representing 53.5% of the total number (Table 1).

Table (1): Sample description.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal &quot;Control&quot;</td>
<td>61</td>
<td>53.5</td>
</tr>
<tr>
<td>Overweight</td>
<td>53</td>
<td>46.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>114</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The resulting statistical values (mean and standard deviation) of the body mass index (BMI) for age, percentile and Z-score were shown in Table (2).

Table (2): Body Mass Index [BMI] statistical values.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N.</th>
<th>BMI For Age</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal &quot;Control&quot;</td>
<td>61</td>
<td>12.80-23.80</td>
<td>15.78</td>
<td>2.1469</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.04-97.75</td>
<td>43.66</td>
<td>30.6328</td>
<td>2.20</td>
<td>1.1558</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3.37-2.00</td>
<td>-0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>53</td>
<td>19.50-34.59</td>
<td>24.71</td>
<td>3.0139</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>98.12-99.9</td>
<td>99.41</td>
<td>0.4916</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.08-4.17</td>
<td>2.69</td>
<td>0.4582</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regarding nocturnal enuresis, the statistical analysis demonstrated that 19 children suffered from nocturnal enuresis, representing 16.7% of the whole sample (114 children). However, 13 (24.5%) of the overweight children (above +2 SD BMI/age) suffered from nocturnal enuresis, compared to 6 (9.8%) of the normal weight children (below +2 SD BMI/age and above –2 SD BMI/age). The difference was statistically significant Chi (1) = 4.41 and p value = 0.032 (Table 3).

Table (3): Relationship between overweight and nocturnal enuresis.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Nocturnal enuresis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Normal &quot;Control&quot;</td>
<td>6</td>
<td>9.8</td>
</tr>
<tr>
<td>Overweight</td>
<td>13</td>
<td>24.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
<td>16.7</td>
</tr>
</tbody>
</table>

Chi (1) = 4.41 and p value = 0.032

**Discussion**

The dramatic increase of childhood overweight became one of the major problems threatening our children health. Many complications occurred affecting their performance, psychology and even their future. The life style of children has been changed to a sedentary type of living. Playing with computers, watching televisions for many hours, neglecting activities and sports, as well as, unhealthy way of eating high caloric diets, all these habits have been implicated in the higher percentage of overweight and obesity in children.

Recently, many studies have been made correlating the relationship between body mass index and urological diagnosis. Some theories had been postulated to explain the association of nocturnal enuresis with obesity. Various studies had been made dealing with nocturnal enuresis from different points of view. Diet and personality might be a part of the etiology of some urological disorders. It was possible that changing the lifestyle might benefit the urological patients who were obese [5].

The current study aimed to demonstrate one of the important complications that occur as a result of increasing weight. The results revealed a positive statistically significant relationship between overweight and nocturnal enuresis in children aged 4 to 12 years, with exclusion of genetic or endocrinial abnormalities, as well as, psychiatric disorders.

The American Psychiatric Association, defined nocturnal enuresis as repeated urination into bed or clothes, occurring twice per week for at least 3 consecutive months in a child of at least 5 years of age and not due to either a drug side effect or a medical condition. Even, if the case did not meet these criteria, their definition allowed psychologists to diagnose nocturnal enuresis if the wettings lead the patient to have clinical significant distress [6].
Punishment rates due to episodes of urine leakage are alarming. Children and adolescents with enuresis who live with low-educated people can be considered a population at risk of suffering domestic violence [7].

Most bed wetters have little or no psychological problems that could contribute to the condition. But, it is a fact that the act itself can cause emotional problems, especially in children who might consider themselves abnormal because of this. Even when bedwetting is not psychological in origin, it can cause emotional problems. The situation is undeniably embarrassing and uncomfortable. It may prevent a child from enjoying such peer activities as a party, or cause him or her to be the subject of ridicule from friends [8].

Another theory explained the problem from genetic vision; proving that bedwetting has a strong genetic component. Children whose parents were not enuretic had only a 15% incidence of bedwetting. Moreover, if one or both parents were bed wetters, the rates jumped to 44% and 77% respectively. Genetic research showed that bedwetting is associated with the genes on chromosomes 13q and 12q (possibly 5 and 22 also). There was a significant hereditary component. Most enuresis sufferers take measures against urine losses. There is no test to prove that bedwetting was only a developmental delay. Genetic testing offered little or no benefit to a bedwetting patient [9].

Sleep apnea stemming from an upper airway obstruction has been associated with bedwetting. Snoring and enlarged tonsils or adenoids are a sign of potential sleep apnea problems. Sleep apnea is one of the common complications that occur in obese children and may be accompanied by nocturnal enuresis. Sleep disturbances in children are typically under-reported and may lead to behavior problems, enuresis, learning difficulties or even sleep apnea. Also deep sleeping may be another cause of nocturnal enuresis [10].

Another theory declared that; there is significant correlation between hypercalciuria, osmolar excretion and diuresis suggesting that it is a co-morbid factor rather than a primary pathogenic factor. Consequently, the results of some studies relating nocturnal enuresis to primary hypercalciuria cannot be confirmed, suggesting instead an association with nutritional intake [11].

Constipation due to excess carbohydrates in meal and lack of vegetables, fruits and fibers was noticed in these children and may be another cause of nocturnal enuresis. Increased intra abdominal pressure due to fat accumulation and decreased bladder capacity also attributed in that complication [12].

Neurological developmental delay was the most common cause of primary nocturnal enuresis. Most bedwetting children were simply delayed in developing the ability to stay dry and have no other developmental issues. Infections and disease are more strongly connected with secondary nocturnal enuresis. Less than 5% of all bedwetting cases were caused by infection or disease, the most common of which is a urinary tract infection [13].

Conclusion:

Nocturnal enuresis was shown to have different etiologies. Therefore, all causes must be put in consideration to manage a case of nocturnal enuresis in an overweight child. This must include dietary management by eating healthy food in proper time, as well as, changing the life style by increasing activities and participating in different regular sports. Psychological family support will help in raising the self confidence of such children to overcome their problem.

References


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