Study the association between Enterobius vermicularis infection and enuresis among children in Al-Najaf city

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Abstract

Enterobius vermicularis or pinworms infection is one of the most prevalent worms found in children worldwide, nocturnal enuresis is an involuntary and un desirable bedwetting beyond age of anticipated bladder control. There is a possible association between certain infection and the propensity to develop nocturnal enuresis including intestinal helminthes infection. Prospective study included (285) randomly selected children aged range (3-14) years from both sex. The children were examined for E. vermicularis infection by adhesive cellotape anal swap. Nocturnal enuresis rates were investigated before and after mebendazole treatment in children with E. vermicularis to search for the association between E. vermicularis infection and enuresis. The overall infection infection rate reported in this study was 37.89% (108/285) divided as 53.70% infection rate for females and 46.29% for males, there are no significant differences between male and female infection. The results showed that E. vermicularis is one of the most frequent intestinal helminthes with nocturnal enuresis among children in Al-Najaf city. From the results, the percentage of children who had entrobiasis and enuresis before treatment mebendazole drug was 26.66%, whereas the percentage after treatment was 14.03%.

Key words: Pinworm, infestation, enterobiasis, children, enuresis.

Introduction

Infestation with E. vermicularis (pinworm) is known as enterobiasis this is the most prevalent worms worldwide with prevalence rates in some communities of as high as 30-50 % (1,2,3). Enterobiasis is linked to age, being most common in children of school age followed by preschool children (4). E. vermicularis common
nematodes infection which occurs throughout the world. The male threadworm is about 4mm long and is rarely seen. The female is bigger at 1 cm long and a little under1mm in diameter. It is white and pointed at each end. It lay an average 11,000 tiny eggs outside the anus, or around the vagina and urethra at night whilst the child sleeps. Eggs are accompanied by an irritant mucosa, which causes intense pruritus and scratching. The eggs get to the hands and from there to the mouth to reinfection (5). Nocturnal enuresis is common problem affecting around (15-20 %) of children than four age and affecting an estimated 5 to 7 million children in united state (6) Nocturnal enuresis is clinic entity with multiple etiology; genetic, insufficient maturation of sphincter impulsion transmission routes and organic causes, such as infections, sickle-cell anemia, diabetes insipidus and psycho-emotional disturbances (7). Among the infection causes of enuresis, E. vermicularis is sometimes cited (8). Primary nocturnal enuresis is an un intended leakage of urine at least once week in child who had never had day or night bladder control for a period greater than six months. Secondary enuresis is considered when the patient has been toilet trained for at least six months after the age of bladder control, and bladder controls subsequently lost (9,10). Recent studies have provided more information about nocturnal enuresis, and generally effective treatments are available (6). It is known that intestinal helminthes play an important role in the etiology of enuresis cases. It has been reported that enuresis was one of the show symptoms in enterobiasis (11,12). There are several drugs, which can help to eliminate E. vermicularis infections. Mebendazole is the drug of choice adults and children older than 2 years It is given as a single oral dose, and is best repeated after (2-3) weeks in case reinfection has occurred the medication must take for whole family. These drugs only kill the adult worms so attention to cleanliness is extremely important (5). Urethral / vaginal reflux has been suggested as cause for enuresis this concept is not widely accepted. The suggestion by (11) somewhat more realistic that a number of cases of secondary enuresis may be due to E. vermicularis infection (11). The debut of enuresis in the same time with the E. vermicularis infection in patient was a clue for a possible relation of causality. In spite of many researches and studies that had been performed on enuresis in general, very limited work talking about the role E. vermicularis in the causation of enuresis. This study was performed to evaluate the possible association between each other and to investigate gender, age and other related factor among children in Al-Najaf city.

Materials and methods
The study was carried out in Al-Najaf city/Iraq between (September 2013- March 2014) to investigate the prevalence of E. vermicularis and enuresis among children who had been admitted to hospitals in Al-Najaf. For this purpose (285) children were included to this study 149 female and 136 male (3-14) years in age. Examined by Scotch tape method (1). Questionnaire about enuresis was constructed and data on name, age, gender, and number of children in family. Data collection was done in cooperation with children mothers. Parasitological examination was done by placing the scotch on glass slide and examine under a microscope. A drop or two of glycerin was placed under the scotch tape to aid visualization of ova these examinations were done before and after Mebendazole treatment (1). Nocturnal enuresis rates were investigated before and after Mebendazole treatment in children with or with no enterobiasis to search for the relationship between enuresis and enterobiasis. One tablet (>2 years; 100 mg PO bid for 3 days) was given as a single dose all family treated and repeated after one week (2).

Statistical analysis
The collecting data had been analyzed and tested by using chi -square. P value less than 0.05 were considered statistically significant (2,16).

Results
A total of 285 children participated in the study, of which (136) 47.71% males and (149/285) was females, the overall infection
rate with *E. vermicularis* reported in this study was 37.89% 108 sample positive from 285 (fig. 1), divided as 53.70% infection rate for females and 46.29% for male, although there was no significant difference (p< 0.05) between both sex. Table (1) showed that the age was related prevalence of enterobiasis, that a higher percentage of the children were within the (6-8) years age group with (37.03%) infection rate, followed by the age group (3-5) years and (9-11) years infection rate (27.77), (25.0%) respectively. On the other hand, the lower infection rate was into (11-14) age group. Which indicated that there was a significant difference (p.<0.05) between the ages of children and *E. vermicularis* infection. From our results, the percentage of children who had entrobiasis and enuresis before treatment mebendazole drug was 26.66%, while this percentage decreased significantly (p<0.05) after treatment with mebendazole 14.03%(40/285) table (2). The results of this study showed no significant differences between male and female in their response to mebendazole treatment (p< 0.05), the percentage of male who had both infection before the treatment was (33/50) 66% and ( 43/58)74% in female, while after treatment the percentage became 34%(17/50) and 39.6%(23/58) in male and female respectively table (2). In the present study,108 children infected with enterobiasis, of which eight were found to be infected with single infection (one child in each family), the rest 100 children there were more than one child within the same family (two or three children) found to be infected with enterobiasis fig. (2)

**Table (1): The rate of infection with *E. vermicularis* and enuresis among children.**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age group</th>
<th>Female (n=58)</th>
<th>Male (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infection with <em>E. vermicularis</em></td>
<td>Enuresis and <em>E. vermicularis</em></td>
<td>Infection with <em>E. vermicularis</em></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>3-5</td>
<td>15</td>
<td>25.86</td>
<td>12</td>
</tr>
<tr>
<td>6-8</td>
<td>22</td>
<td>37.93</td>
<td>18</td>
</tr>
<tr>
<td>9-11</td>
<td>13</td>
<td>22.41</td>
<td>7</td>
</tr>
<tr>
<td>12-14</td>
<td>8</td>
<td>13.79</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>53.70</td>
<td>43</td>
</tr>
</tbody>
</table>

**Table (2): The rate of infection with *E. vermicularis* and enuresis among children before and after treatment.**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Before treatment with Mebendazole (100 mg once)</th>
<th>After treatment with Mebendazole (100 mg once)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Female (n=149)</td>
<td>43</td>
<td>28.85</td>
</tr>
<tr>
<td>Male ( n=136)</td>
<td>33</td>
<td>24.26</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>26.66</td>
</tr>
</tbody>
</table>

Fig. (1): The infection rate of *E. vermicularis* among children in Najaf city.

Fig. (2): Distribution of *E. vermicularis* infection among families.

*mean one child infected in each family.* **mean two or more children in same family.
Discussion

Enterobiasis is one of the commonest human parasitic infections in the world (1). Children are more commonly affected than adults, the disease more prevalent in temperate regions and are facilitated by factors such as family grouping and overcrowding in schools, as well as inadequate personal and community hygiene (13). The present study showed that the overall E. vermicularis infection among children from (3-14) years was 37.89% (fig.1), this result considered higher than previous results by Kadir and Amin who got total infectivity rate about 29.5% in Sulaimania/Iraq (14) and other study in Baghdad reported 13.2% infected children with enterobiasis (15), while it less than what was registered in other study (84.31%) among 51 children from 3-12 years who lived in orphanage institute in Baghdad /Iraq (16) and among 80 children in Turkey orphanage institute was (71.3%) (2), the differences can be due to the difference in patient sampling, the ways to identify E. vermicularis infection and the duration of the study. The results also showed that the infection rate in females was (53.70%) which is higher than males (46.29%) table (2), although there is no significant difference (p< 0.05) between both sexes, this result was agreed with other studies (2,12,16). This suggests that both of them are equally exposed to parasitic infection, and lead to say that the children sex not essential factor in the determine the ability of children for infection (11,16). Table (1) showed that the age was related prevalence of enterobiasis, that a higher percentage of the children fall within the (6-8) years age group with (37.03%) infection rate, followed by the age group (3-5) years and (9-11) years infection rate (27.77), (25.0%) respectively. On the other hand the lower infection rate falls into (11-14) age group. Which indicated that there is a significant difference (p<0.05) between the ages of children and E. vermicularis infection. So age is a risk factor for enterobisis in both sexes, all ages may be affected but the prevalence is highest between the ages 3 to 8 years (15,17). Adult are least common age group to experience enterobiasis, with the exception of mothers whose children are infested hygiene (18). From our results, the percentage of children who had both enterobiasis and enuresis were 26.66% (76/108) before treatment, while this percentage decreased significantly (p<0.05) after treatment with mebendazole 14.03% (40/285). Studies on the association between E. vermicularis infection and nocturnal enuresis among children are limited in Iraq. In a study conducted by (16) the percentage of children who had pin worm infection and enuresis was 58.82% (16). Similarly, from studies conducted in our country among the enuretic children, in the study of (14) the enterobiasis was present in 61.42% in the enuretic children. In another study (2) investigated the frequency of E. vermicularis in 80 children and reported a significant decrease of the prevalence of enuresis occurred depending on the decrease of the E. vermicularis infection after mebendazole treatment (2). Pinworms has been reported to cause pathology in the reproductive system and genital of female and male with primary or secondary enuresis not only in children, but by other study confirmed that and considered E. vermicularis as a possible etiologic factor in any female and male with enuresis (8,19). The results of this study show no significant differences between male and female in their response to mebendazole treatment (p<0.05), the percentage of male who had both infection before the treatment was (33/50) 66% and (43/58)74% in female, while after treatment the percentage became 34% (17/50) and 39.6% (23/58) in male and female respectively table (2). This results agreed with others study who demonstrated non significant differences between female and male after treatment in spite of the difference in the type and the number of sample (16), and this result disagreed with other study who find significant differences between female and male in enuresis after treatment (2). Ectopic location of E. vermicularis infection leads to enuresis episodes every time when a psyche motional factor was added. The frequent passage of the females through the urinary sphincter may be
that is restricted to the temperate regions of the world, and may be a cause of enuresis or at least a contributory factor in the development of this complaint (12).

Conclusions

*E. vermicularis* infection considerable affection on the human health special for children and has a sensible role in the etiology in enuresis, this study as message for each family and institutions who care with children to non-carelessness infection with this helminthes and each enuretic children should be screened for enterobiasis, in addition to intensive work in different aspects including education of the populations and improving adenence personal and communal hygiene behavioral.

References