ENTEROBIASIS AND ITS RELATIONSHIP WITH ENURESIS AMONG ONE OF ORPHANGE CARE CHILDREN IN BAGHDAD- IRAQ

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Abstract

The prevalence of Enterobiasis and Enuresis were screened in this study, to evaluate the possible relationship between each other, and to investigate age, gender related factors in fifty one orphanage Iraqi children their age (3-12) years, before and after albendazole treatment. The results showed that *Enterobius vermicularis* is one of the most frequent parasites in orphanages, the overall infection rate (84.31%) was reported in this study, and gender is less related with the prevalence of enterobiasis , the infection rate in males(55.81%) was higher than females(44.18%) , although there was no significant relation ($p \leq 0.05$) between gender and infection rate of enterobiasis , while a significant relationshp between enterobiasis and nocturnal enuresis were investigated ($p \leq 0.05$) , the percentage of children who had pinworm infection and enuresis was 58.82% before treatment, while the percentage after treatment with Albendazole was 11.76%. Questionnaire interviews were used to determine which of the children suffered from some clinical symptoms gathered with enuresis.

الخمج بالدوده الدبوسية و علاقته بالتبول اللاأرادي في اطفال احدى دور رعاية الأيتام / بغداد–العراق

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الخلاصة

تم التحري عن انتشار الأصابة بالدوده الدبوسية و علاقتها المحتملة بالأصابة بالتبول الليلي مع التعـرف على دور عاملي العمر والجنس في تلك العلاقة في واحد وخمسين طفل تتراوح اعمارهم من (٣–١٢) سنة مـن احدى دور رعاية الأيتام العراقية قبل وبعد العلاج بالابندازول . اوضحت الدراسة ان الخمج بالدوده الدبوسـية شائع في دور الأيتام ، حيث بلغت معدل الأصابة الأجمالي (٨٤,٣١%) ، وقـد كـان معـدل الأصـابة فـي الذكور(٥٥,٨١%) اعلى من معدل الأصابة في الأناث(٤٤,١٨%) على الرغم من عدم وجود علاقـة معنويـة ($p \leq 0.05$) بين عامل الجنس و الخمج بالديدان الدبوسية ، بينما كانت هناك علاقة معنويه ($p \leq 0.05$) بين كـل من الخمج بالدوده الدبوسية والتبول اللاأرادي الليلي ، حيث بلغ نسبة الأطفال الذين يعانون من الخمج بالـدوده الدبوسية والتبول اللاأرادي الليلي قبل العلاج بعقار البيندازول ٥٨,٨٢% بينا كانت النسبة بعـد العـلاج بـنفس

العقـــار ١١,٧٦%. تم عمل استبيان للأطفال المصابين بالتبول الليلي لتحديد بعض الأعراض الصـــحية المصاحبة للأصابة.

Introduction:

Enterobius vermicularis (Pin worm) is an intestinal nematode of humans and its principal mode of transmission is direct contact between infected and uninfected persons [1]. Infestation with pin worm is known as enteriobiasis. this is the most prevalent worms found in children worldwide with an estimated 14% of the population in the United States , 29% (Denmark) , 39% (Thialand) , 50% (England) , ,61% (India) and 25.71% in Iraq [2,3].

Pin worm infestation is linked to age being most common in children of school age, followed by preschool children. Adults are the last common age-group to experience enterobiasis, with the exception of mothers whose children are infested [4].

Human infections occur when the eggs in the infective stage are accidentally ingested in a contaminated environment [1]. Symptoms may take weeks or even months to be noticeable after the eggs are ingested [2]. While one third of those infested are asymptomatic, others begin to notice troubling vague and non specific symptoms [5].The most common symptoms of enterobiasis are anal, perianal puritis, stimulated by movement of female, and the albuminous substance that surrounds the eggs [6]. Other manifestations are anorexia , abdominal pain , irritability , disturbed sleep , insomnia , and restlessness [4]. A high prevalence of enterobiasis can be detected in children with low socioeconomic status, and this infection affects the general health as well as the intelligence of the infected children [7].

There are several drugs, which can help to eliminate pin worm. One of the most common drugs is mebendazol. It is usually taken in a single dose or perhaps in two doses two weeks apart. The whole family must take the medication; otherwise is not be very helpful. These drugs only kill the adult worms so attention to cleanliness is still extremely important. Petroleum jelly or anti-itch creams and ointments must be applied 2-3 times per day to reduce the itching that that continues the cycle of infection [8].

The word enuresis is derived from a Greek word that means "to make water". InNorth America , the term is used to refer to wetting by night or day, and night time wetting is referred to as nocturnal enuresis (NE). Nocturnal enuresis can be divided into primary nocturnal enuresis (PNE) and secondary nocturnal enuresis (SNE). If child has experniced a minimum 6 month period of continence before the onset of the-bed wetting, the NE is considered SNE [9]. Bed wetting (NE) is a socially disruptive and stressful condition which affects around 15-20% of children older than five, and up to 2% of young adults, and it is considered an important childhood problem that has been associated with a wide variety of child disorders, and with socio-environmental of the family [10].

Studies on the association between *Enterobius vermicularis* infection and nocturnal enuresis among children are limited in Iraq. So we tried in this survey to investigate this relationship between *Enterobius vermicularis* and enuresis among children in Iraqi orphanage institute because the child care centres, and other institutional setting often have more cases of pin worm infection [11].

Materials and MethodsSubjects:

The current study was carried out in Baghdad / Iraq between June 2008- August 2008 to find the prevalence of enuresis and enterobiasis among children living in Dar AL-Tofola orphanage Institute AL-Salihya/ Baghdad. Fifty one orphan children were included in this study (21 female and 30 male) range from 3-12 years each of them have a good toilet training. Questionnaire about enuresis was constructed and data on age, gender anal itching, and inflammation was gathered. Data collection was done in cooperation with children nurses.

Stoll collection and examination

Stool collection by digital (finger) rectal exam technique was done of collecting eggs or worms as described by [8,12], briefly: the position of the child body for this test may be asked to lie on the left side of his chest with right knee and right thigh drawn up and asked him to inhale slowly as insert a lubricated and gloved finger into his anus to collect a stool sample. The sample is placed on a microscope slide and examined as soon as possible [4, 8].

Enuresis investigation & treatment

Nocturnal enuresis rates were investigated before and after Albendazole treatment in children with and with no enterobiasis to search for the association between enuresis and pin worm infection. Data collection was done in cooperation with children's nurse. Albendazole (Zentel) , 400 mg was given orally as single dose for the purpose of treatment , all residents living on the same institute were treated also by one-dose of Levamisole (HCL) Katrex as worm expeller.At the end of treatment (after 14 days), stool samples were taken from all of children and examined by microscope.

Statistical analysis

Experimental data were presented in terms of observed numbers and percentage frequencies, and then analysed by Statistical Package for Social Sciences (SPSS 10.01) using the Chi-square test, P value $\leq$ 0.05 was considered statistically significant.

Results and Discussion:-

Enterobius vermicularis is one of the most frequently encountered nematodes. It is highly contagious and parasitizing the human intestinal tract. It is known that the transmission of enteroparasites depend on the presence of infected individual , sanitation deficiencies and , principally , the socio economic and cultural condition of the population [13].

The present data showed that the overall prevalence rate of enterobiasis among children from 3-12 years who lived in orphanage institute in Baghdad / Iraq was 84.31% (figure 1) , the number of positive sample were 43 out of 51 child , this results considerd higher than the previous results by Kitvatanachai *et al*. [14] who got total infectivity rate 15.95 % in Thailand orphanages while other epidemiological studies reported 60% in Egyptian orphanages [15] and 94% in Turkish orphanages [16], the main reason for these high rates of *E.vermicularis* infection among orphan children inside orphanages may be related to the direct contact between them , especially when this parasites confirmed previously as most prevalent parasite in overcrowded areas or in families with many members [1,16]. *E. vermicularis* appears a highly successful parasite in countries where the socio-economic and environmental conditions are thought to be less hygienic, it is easily transmitted among family members through inhalation, contaminated hands and fomites [17, 18].Other factors that are often believed to be related to the high transmission of *Enterobius vermicularis* in this orphanage are the area of the bedroom, the age of children, and behavioral patterns. The results also showed that the infection rate in males 55.81% (24/43) was higher than females 44.18% (19/43) , although there was no significant relation ($p \leq 0.05$) between gender and infection rate of enterobiasis (figure 2) , this results was agreed with other previous studies by [14 ,15 ,19] , the non significant differences can be explained as both gender were lived in the same place and had the same chance in playing and eating as well as sharing the same toilets , so the exposure to infectious agent may not varied very much between genders .However, *Enterobius vermicularis* has been reported to cause pathology in the genital and reproductive system of females [20].

Table (1) showed the age related prevalence of *Enterobius vermicularis* , the maximum infection rates 43.88% , 20.98 and 20.98 were seen in age group 4 , 5 and 6 years respectively , children infected with pinworm scratch themselves; eggs are picked up under their fingernails and then deposited on toys, books, or back into the mouth, if the child is a thumb-sucker or nail-biter [21]. Results also showed that percentage of asymptomatic infection was 16.27% (7/43) , while the symptomatic infections were seen as following :infection with itching only 25.5% (11/43) , infection with inflammation only 11.62% (5/43) and 46.5% (20/43) was the percentage of infections with itching and inflammation table (2). In this study, we attempted to determine the relationship between enuresis and *Enterobius vermicularis* infection among Iraqi orphanage children, and up to our knowledge, studies on this relation is limited in Iraq. Nocturnal enuresis rates were investigated before and after Albendazole treatment in children with and with no enterobiasis.

The percentage of children who had both pinworm infection and enuresis were 58.82% (30/51) before treatment, while this percentage decreased significantly ($p \leq 0.05$) 11.76% (6/51) after treatment with Albendazole Figure 3. Similar association between nocturnal enuresis and pinworm infection revealed by Culha and Duran

[22] who investigated that there were a significant decrease of the prevalence of nocturnal enuresis occurred depending on the decrease of the prevalence of *Enterobius vermicularis* after treatment with mebendazole. Other similar results were reported also by [23, 24], urethral / vaginal reflux has been suggested as cause for enuresis [22].

The results also showed no significant differences ($p \leq 0.05$) between female and male in their response to albendazole, the percentage of female who had both enterobiasis and nocturnal enuresis before treatment was 63% (14/22) and 55.17% (16/29) in male, while the percentage became 10.5% (2/19) and 12.5% (4/32) in female and male respectively after treatment

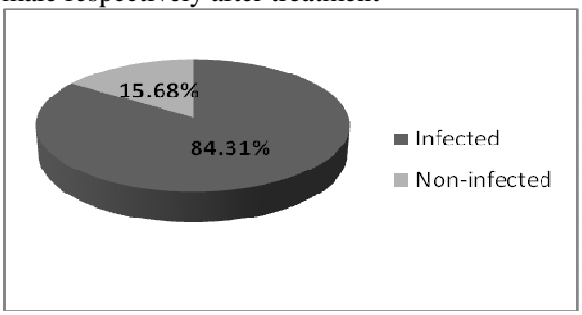

Figure 1: Infection rate of *Enterobius vermicularis* among orphanage children in Iraqi institute

(figure 4). our results disagreed with others who demonstrated significant differences between male and female in enuresis after treatment [22] this differences may due to the large number of children that participated in their studies , as well as females may take a very big concerns especially when some investigators initiate their study on vulvovaginitis which may associated with pin worm infection and other pathogenic agents [25 ,26].

Despite medication; enterobiasis has not been eradicated completely in this study this may be that some eggs take more than 14 days to mature. Alternatively , some children re-infected due to nail biting , inadequate hand washing or perianal cleaning. It may be necessary to treat such repeatedly infected children with two to three doses of medication at sequential 14 days intervals.

In conclusion our findings revealed that *Enterobius vermicularis* is a high prevalent parasite among orphanage children, as well as relation between noctournal enuresis and pinworm infection was confirmed in this study. So children with enuresis have to be screened for *E.vermicularis* infection, especially in orphanages, schools and kindergarten.

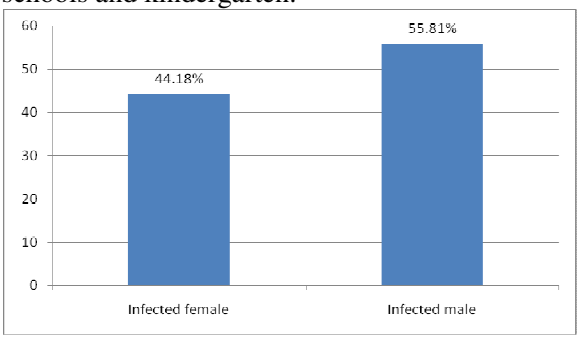

Figure 2: Infection rate of *Enterobius vermicularis* in male and female According to gender

Table 1: age related prevalence of *Enterobius vermicularis*

Age group/ years	*Total number*	*infected*	*Non infected*
3	8	6	2
4	18	15	3
5	9	9	0
6	12	9	3
8	2	2	0
11	1	1	0
12	1	1	0
Total	51	43	8

Table 2: symptomatic and asymptomatic patien

Asymptomatic patient	Symptomatic			
	Itching	inflammation	Itching + inflammation	total
7	**11**	**5**	**20**	**43**
16.27%	**25.5%**	**11.62%**	**46.5%**	**100%**

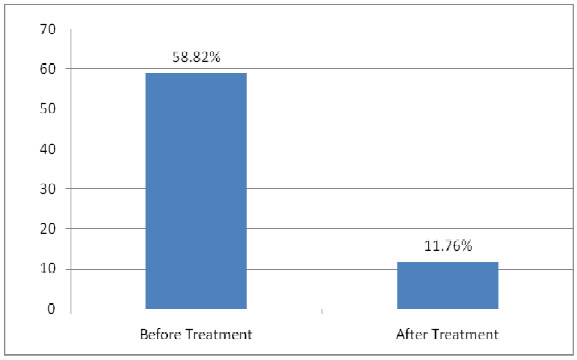

Figure 3: The percentage of pinworm infected orphan children with enuresis before and after treatment in Iraqi orphanage institute

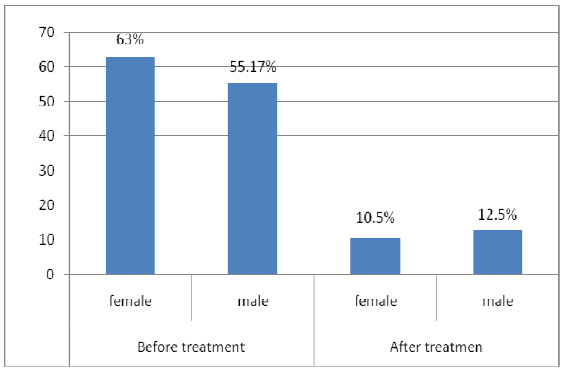

Figure 4: The percentage of pinworm infected female and male with enuresis before and after treatment in Iraqi orphanage institute

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