Study of *EnterobiusVermiculris* infection among children Inin Karbala Governorate, Iraq

Abstract

During the period from October 2022 to March 2023, 40 samples were examined for children aged 5-12 years in primary school. The examination was done using the Scotch tape method.The results of the current study showed that the pinworm Enterobius vermicularis is widespread, with the total infection rate reaching 62.5% (61.53% in males and 62.96% in females).The results also showed that there were no significant differences in infection with the pinworm Enterobius vermicularis in terms of age and gender.

Key words: *EnterobiusVermiculris*, Abdominal pain , children

Introduction

Infection with intestinal parasites remains a public health problem. The most important of these parasites is pinworms, which are widespread worldwide. The number of people infected with enterobiasis is estimated at hundreds of millions, infecting individuals of different economic and social levels, but the most common infection is among children, estimated at 50%. (Chin, 2000; Prince, 2002.) Direct contact with infected people is one of the most common ways of rapid transmission of this parasite. For this reason, infection is prevalent among primary school and kindergarten children who are exposed to crowded conditions, lack of health care, in addition to lack of health awareness. (Beaveret al., 1994; Cook, et al., 1994)

Adult worms live in the cecum (appendix) and adjacent parts of the intestine, from which females migrate to the rectum, causing several problems, including sleep

disturbance (insomnia), nocturnal urination (urinary incontinence) at times, itching of the anus, and inflammation of the vagina and fallopian tube in females resulting from the movement of worms and their migration at night. To lay eggs outside the intestine around the exit opening (Panikeret al., 2000).The incidence of pinworm infection in Iraq, according to the statistical analysis of the Iraqi Ministry of Health during the period (1988-1998), ranked first among recorded intestinal worms, followed by hookworm, and then Yellow lumbricoides (Al-Quraishiet al., 2002).

Pinworms are among the most widespread intestinal worms due to their short direct life cycle, as they do not need an intermediate host to infect a new host. They have the ability to be transmitted to the mouth through water and food contaminated with feces containing mature eggs, and through contaminated hands, insects, and wind during hot weather (Idowa& Rowland,2006).

Aim of the study:-

Due to the lack of research on the aforementioned parasite in the Holy Governorate of Karbala and the rapid spread of the pinworm Enterobius vermicularis.

Therefore, the study aimed to do the following:

Investigating the spread of pinworm infection, Enterobius vermicularis, among children in primary schools within the Holy Governorate of Karbala.

Material and methods

For used materials and equipment.

1- Compound Light Microscope.

2- Scotch Tape.

3-Toluel.

4- Iodine I2.

5- Xylene.

6- glass slide.

7-Cover Slide cover.

Sample collection.

The study samples were collected and examined for the period between the beginning of October 2022 and the end of March 2023. The number of those examined reached 40 children (13 males and 27 females) whose ages ranged from 5 to 12 years, which is the age for kindergartens and primary schools where infection is concentrated.The examination was then conducted using the Scotch Tape method, and the required samples were collected through a Questionnaire form, which included the following information:

•the name .

• Age and gender.

•number of family members .

• Parents' occupation (education level of parents).

Examination method.

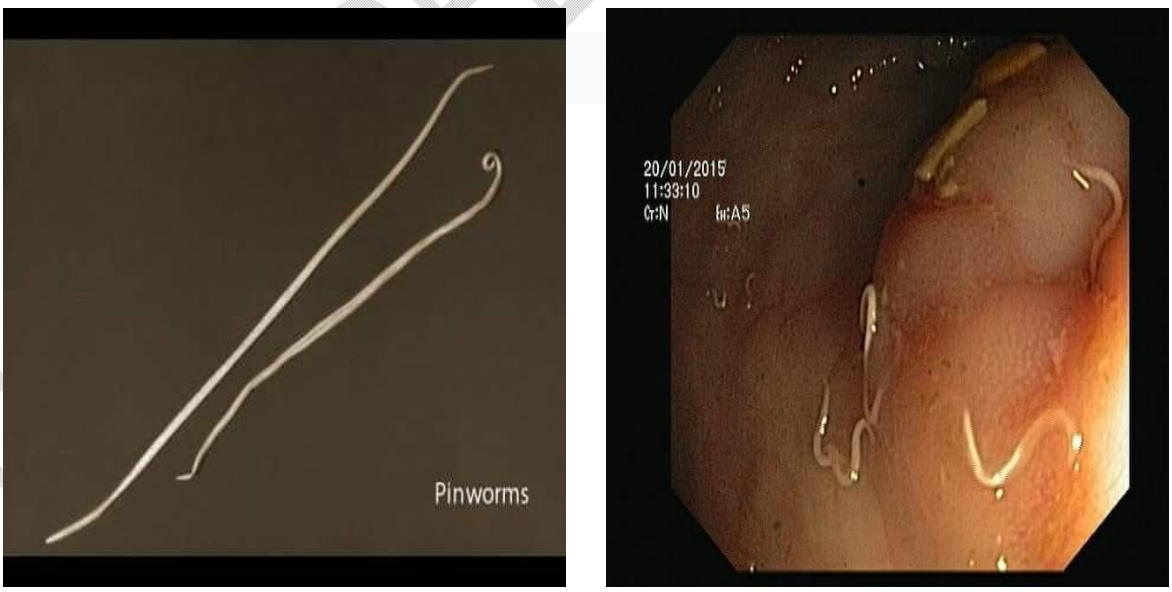
Scotch Tape Method. Where a piece of transparent tape is placed on the exit area in the morning and before defecation, then this piece is removed after wiping and spread on a glass slide and examined after clarification. A drop of Toluel and another of Iodine I2 with Xylene are placed between the slide and the tape (Al-Hadithi and Awad, (1986).

Statistical analysis:-

Statistical analysis was conducted using the Chi-Square-Test (Al-Rawiet al., 1992) under a probability level of 0.01.

Results:-

During the study period from October 2022 to March 2023, 40 samples of children aged 5-12 years were examined in the Parasitology Laboratory in the Department of Life Sciences - College of Education for Pure Sciences, using the Scotch Tape Method, where the total number of infected children reached 25 children (8 males and 17 females) The total infection rate was 62.5% (61.53% of males and 62.96% of females). The results were calculated statistically using the Chi-Square-Test as shown in Tables (1, 2, 3). Below the probability level (0.01), the results of the analysis showed that there were no significant differences in pinworm infection between infected children in terms of gender and age.



Pic 1. Picture shows pinworms (male and female).

Table No. (1): Percentage of males infected with pinworms in the Holy Governorate of Karbala.

Age (years)	Number of	Number of people infected	pinworms

	people tested		Percentage%
6-5	6	2	33,33
7	2	2	100
8	1	1	100
9	1	1	100
10	2	1	50
11	1	1	100
12	0	0	0
Total	13	8	61,53

Table No. (2) Percentage of females infected with pinworms in the Holy Karbala Governorate

Age (years)	Number of people tested	Number of people infected	pinworms Percentage%
6-5	9	6	66,66
7	1	1	100
8	2	2	100
9	3	1	33,33
10	4	2	50
11	3	2	66,66
12	5	3	60
Total	27	17	62,96

Table No. (3): Percentage of males and females infected with pinworms in the Holy Governorate of Karbala

Age (years)	Number of people tested	Number of people infected	pinworms Percentage%
6-5	15	2	53,33
7	3	3	100
8	3	3	100
9	4	2	50
10	6	3	50
11	4	3	75
12	5	3	60
Total	40	25	62,5

Discussion :-

Pinworms are intestinal parasites that are of medical importance to humans, as they cause anal itching, abdominal disorders, and appendicitis, and the infection may reach the colon and genital area.(Beaveret al., et.al, 1994; cooket al., 1994; song, et.alet al., 2003)

Enterobiasis is less widespread in tropical regions because children rarely wear underwear and bathe frequently, and eggs are constantly destroyed in hot weather compared to cold regions where people wear underwear and use many layers of bedding, which facilitates the transmission of the infection. (Panikeret al., 2000).

The results of the current study showed that the total infection rate with pinworms was 62.5% (61.53% males and 62.96% females) Table No. (3), which is close to the infection rate recorded in Al-Esawi (2010) in Babil Governorate, which is (49.03%) and (2006), AL-Quraishi in Babil and Najaf Governorate (37.12%). On the other hand, the total infection rate for the current study was higher than what was found in both (AL-Jeboori&Shafiq, 1976) in the University district and Sadr City in

Baghdad by (3% and 10%, respectively (Jassanetal, 1986)) in Kirkuk city (6.6%).) and Mahdi & Jassim (1987)) in the city of Basra (0.6%), Al-Khafaji (1999) in the Hashemite District in Babylon (11.9%), Al-Kubaisi (2000) in the city of Hilla (10.4%), and Al-Musawi (2004) in the city of Karbala (2.9%).The reason for the similarity and difference in the infection rates recorded in the current study with the previously mentioned studies is due to several reasons, including the similarity of the environmental and climatic conditions of the country in general, in addition to the difference in sample size and variation in the ages at which the study was concerned.

The low infection rate recorded in previous studies is also due to the use of the direct swab method. 'Only, which does not reveal to the researcher the presence of pinworm eggs due to the lack of eggs that are shed with exit, given that the worm does not lay eggs in the intestinal area, but rather migrates outside the rectum and lays its eggs around the exit opening, so the number of eggs mixed with exit is relatively small (Al-Hadithi and Awad, 2000).

Enterobiasis has a global spread, as it affects school-age children. In general, the life of the worm is characterized by what is called re-infection or auto-infection, where the infection occurs directly from the outlet to the mouth through hands contaminated with worm eggs. Infection may occur directly from one person to another, and lack of personal hygiene, such as not washing hands after defecation, before eating, and when preparing food, plays a major role in the rapid and high spread of the worm (Okyay et.al..2004).As for pinworm infection and its relationship to the age group of those infected, it was found that the infection rate was highest in children aged 7 and 8 years (100%), while the lowest rate of infection with the parasite in children aged 9 and 10 years was (50%) Table No. (3),

and this may be due to To the lack of personal hygiene and not following healthy habits such as washing hands after defecation, as well as extending their fingers to their mouths and biting their nails with their teeth.As for pinworm infection and its relationship to sex, it has been shown that the infection rate in females is higher than in males (61.53%, 62.96%), respectively, Table No. (1.2) due to the anatomical and structural difference between the sexes (Al-Hadithi and Awad, 1986).

No significant differences in infection were observed with respect to age and gender, due to the presence of the same chance of infection of both sexes and different ages with the aforementioned parasite

In conclusion:In light of the results obtained from the current study, the following conclusions were reached:

A widespread spread of pinworms, as the total infection rate for children aged (5-12) years in the Holy Karbala Governorate reached (62.5) using the adhesive tape method and the results of the current study showed that infection in females (62.96%) was higher than in males (61.53%). As well as there were no significant differences in the rates of total pinworm infection among the children examined in terms of age and gender.

Conclusions

In light of the results obtained from the current study, the following conclusions were reached:

1- A widespread spread of pinworms, as the total infection rate for children aged (5-12) years in the Holy Karbala Governorate reached (62.5) using the adhesive tape method.

2- The results of the current study showed that infection in females (62.96%) was higher than in males (61.53%).

3- There were no significant differences in the rates of total pinworm infection among the children examined in terms of age and gender.

Reference

Arif, A.E. & Hassoun, A.S.(1969). An intestinal parasite survey amongst food handlers in Baghdad. 1966-Bull. End. Dis., 11(1-4):7-27.

AL-Esawi‹N.N(2010).Assessment of the activity of Bentonite clay in Ascaridid galli and Enterobiusvermiulavis infection and it is relationship with Enuresis phenomenq among children in Babylon provinve M.se. Thesis. coll. sci. Babylon univ:90.pp.

AL-Jeboori,T.l&shafiq, M.A(1976).Intestinal parasite in Baghdad:asurvey in two districts .J.fac.Med.Baghdad , 18(3&4):161-170.

AL-Quraishi ,M.ch (2006).The relationship between the infestation with Enterobiusvermiulavis and Enuresis in children , Med.J.Babylon ,3(1-2):164-168.

AL-Quraishi,M.Ch.(2002).Ageneral study about human helminthes and their geographical distribution in the republic of Ph.D. college of sciences. Kazan Univ. 160 PP.

Bailey V.M. &Khamis ,f.(1958)An intestinal Parasite survey in qrual district of Baghdad, Bull.End.Dis,2(3&4):152-155.

Bailey, V.M. (1956) A cursory examination and comparison of stool examination methods. Bull. End. Dis., 1(4):295-297.

Beaver,P.C.:jung,R.C.&Cupp,E.w.(1994) clinical parasitology 9thed .pp0302-306 .lea &febiger , USA.

Chin , J.(2000) , contnol of communicable disease :Manual , 17thed :Amer. Public health Assoc , Washington :624 pp.

Cook ,G.C.(1994). Enterobiusvermiulavis infection Gut 35 ed :1159-1162.

Idow ,O.A.&Rowland,S.A.(2006).Oral fecal parasites and personal hygiene of food handlers in Abeokuta ,Nigeria.African Health Sciences,6(3):160-164.

Jassan ,B.A.: AL-Dujali ,A.A&Saleh,M.M(1986) prevalence of intestinal parasites in school children of Kirkuk city, Iraq.J.Biol. sci.Res, 17(2): 119-125.

Mahdi ,N.K.&Jassim,A.H(1987).Intestinal parasitic infections of primary school children in three regions of southemIraq.Mad.J.Basrah Univ.,(1):85.61.

Okyay, P.; Ertug, S.; Gultekin, B.; Onen, O.& Beser, E (2004).Intestinal parasites prevalence and reiated factors in School children,a western city Sample-Turkey. Bio. Med. Central. J., 4:64.

Panidis,s,paramythioti,D,panagiotou,D.,batsis,salonikdis,s., kaloutsi, V. &Michalopoulos,A.(2011).Enterobiusvermicularis infection in amiddle – agedman, Med-J.Greece,9(3):15-16.

Prince, A.(2002). Infectious diseases. In:Behrman, R. E. &. Kliegman, R. M. (Eds.) Nelson essentials of pediatrics, 4th ed., W. B. Saunders. Philadelphia: 359-468. Senekji,H.A.;Boswell, c. &beattie,c.p. (1939).The incidence of intestinal parasites in Iraq. Trans. Roy. Soe. Trop. Med. Hyg, 33(3): 349-353.

Song.H.J.cho,C.H.,Kim,J.S,:choi,M.H.&Hong,s.T.(2003). Prevalence and risk factors for enterbiasis among preschool children in Aneteropolitan city in Korea .parasitol.Res,91:46-50.