Journal homepage www.jzs.univsul.edu.iq
Journal of Zankoy Sulaimani
Part-A- (Pure and Applied Sciences)

Prevalence of Intestinal Parasites in Houses Mice (*Musmusculus*) among Different Localities of Erbil City, Kurdistan Iraq

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Article info

Original: 10 May 2016
Revised: 1 June 2016
Accepted: 5 June 2016
Published online:
20 December 2016

Key Words: Houses mice, intestinal parasites, Erbil-Kurdistan, Iraq.

Abstract

Parasites of small mammal's (houses mice) living in human areas cause a tremendous burden of vector borne disease. Small mammals infected with parasites can readily facilitate parasitic transmission to humans and other susceptible animal hosts. The objective of our study is to determine the presence of intestinal parasites in mice collected from five different popular localities in Erbil city during the period of (2014-2015). Out of total (60) mice (*Musmusculus*) examined, 34(56.6%) of which were infected with (1-3) species of intestinal parasites. In this study eight species of intestinal parasites were detected and identified as follow as: Four types of intestinal protozoans: *Entamoebamuris* 6(17.6%), *Trichomonasmuris* 3(8.8%), *Giardia muris* 4(11.7%) and *Emeria sp*.2(5.8%),two types of Cestodes: *Hymenolepis nana*8(23.5%) and *Hymenolepisdiminuta* 3(8.8%), and twotypesof mice pinworm: *Aspiculuristetraptera*4 (11.7%) and *Syphaciaobvelata* 4 (11.7%). Among total mice (34) infected with intestinal parasites, infection with helminthes were more prevalence 19(55.8%) than protozoans15(44.1%). According to the multiple infectionwith the parasites, we found that mice infected with the single infections 20(58.8%) were higher than both double 10(29.4%), and triple 4(11.7), and about sex of mice involvement, we found that females were highly infected 21(61.7%) than males13 (38.2%). The results of the present study showedthat the prevalence of the parasites in mice collected from Hayaskary were highlyinfected (29.4%) compared with the other localities of the study areas.

Introduction

Rodents are the most widely distributed and the largest group of small mammals in the worldwide. They harbor several parasitic diseases with medical and veterinary importance, its play an important role as reservoir hosts for vector borne diseases agents [1]. The house mice *Musmusculus* easily adapts to living near people. It lives in a wide range of climatic conditions in a great variety of habitats, feeding on most human food. Rodents are important vectors of many pathogenic microorganisms and can also act as important reservoirs for parasitic zoonosis, [2]. Increased rodent population in an area can be directly related to the increased zoonotic diseases in human population [3]. In addition to be infested with zoonotic helminthes, rats and mice are infected with several zoonotic bacteria [4]. Rodents have a greater ability than most other animal species to harbor many zoonotic agents, given their broad distribution and their close contact with different animals and humans, [5]. The goal of current study is to investigate the presence of intestinal parasites obtained from houses mice trapped in the five more public localities in Erbil city, capital of Kurdistan regional-Iraq. In Iraq, relatively, few studies have been done on intestinal parasites of houses

mice; therefore, the objective of the present study is an additional knowledge about intestinal parasites in houses mice in Iraq.

Materials & Methods

A total of 60 mice live-captured (*Musmusculus*, Linnaeus 1758) were collected from popular localities in Erbil city during the period of 2014-2015. Trapping of live mice were carried out during the period by using Lure Traps. Mice were collected from five regions in Erbil City (Mantikawa, Hayaskary,Binsylawa, Saydawa and Tayrawa) and examined in the laboratory parasites in college of education salahaddinuniversity, looking for presence of intestinal parasites (helminthes and protozoa). The captured mice were euthanized and their sexes were recorded. Nematodes were preserved in 5% formalin solution and placed under a drop of lacto phenol on temporary mount and Cestodes were fixed in AFA solution and stained by acetocarmine and cleared in xylol for identification. The protozoans parasites preferred after fixed with using private solution. The detected intestinal parasites of infected mice were identified after staining by using some known books of parasitology[6,7,8]

Table 1: Shows the prevalence of intestinal parasites during examination of 60 mice in five localities in Erbil city.

Localities of The study	No. of mice examined	No. of mice infected (%) Total (%)	Males (%)	Females
Mantikawa	12	7 (58.3)	3 (42.8)	4 (57.1)
Hayaskary	12	10 (83.3)	4 (40.0)	6 (60.0)
Binsylawa	12	5 (41.6)	2 (40.0)	3 (60.0)
Saydawa	12	5 (50.0)	1 (20.0)	4 (80.0)
Tayrawa	12	7 (58.3)	3 (42.8)	4 (57.1)
Total (%)	60	34 (56.6)	13 (38.2)	21 (61.7)

Table 2: Shows the distribution of intestinal parasites in 34 infected mice among five localities of Erbil city.

Type of Parasites	Localities of the mice collected and infected Mantikawa	Hayaskary	Binsylawa	Saydawa	Tayraw	Total (%)
E. muris	1	2	1	1	1	6(17.6)
G.muris	1	1	0	1	1	4(11.7)
T.muris	1	1	0	0	1	3 (8.8)
Emeriasp.	0	1	0	0	1	2 (5.8)
H.nana	1	2	1	2	2	8 (23.5)
H.diminuta	0	1	1	0	1	3(8.8)
A.tetraptera	1	1	1	1	0	4 (11.7)
S.obvelata	2	1	1	0	0	4 (11.7)
Total(%)	7(20.5)	10(29.4)	5(14.7)	5(14.7)	7(20.5)	34(100)

E=*Entamoeba*, G=*Giardia*, T=*Trichomonas*, H=*Hymenolepis*, A=*Asicularis*, S= *Syphacia*

Table 3: Shows the distribution of single, double and triple infections with intestinal parasites in infected mice in Erbil city.

Type of infection	No. ofinfection (%)
Single	20 (58.8)
Double	10 (29.4)
Triple	4 (11.7)
Total	34(100%)

Results and discussion

In current study out of total (60) mice examined, 34 (56.6%) of which were infected with intestinal parasites 13 (38.2%)males and 21 (61.7%) females (table 1). The study included five more popular localities in Erbil city, which were as follow as:Mantikawa,Hayaskary,Binsylawa,Saydawaand Tayraw. The recent study indicatedthat themice examined in Hayaskary areawere highly infected10(29.4%) with the intestinal parasites compared with the others (table2). seven species of intestinal parasites were detected in current study and these identified as follow as: one type ofCestodes:*Hymenolepis nana*11 (32.3%) and two type of nematodes as mice pinworm:*Aspicularistetraptera* (11.7%) and *Syphaciaobvelata* (11.7%), and four species of intestinal protozoans were identified as follow as: *Entamoebamuris* 6(17.6%), *Trichomonasmuris* 3(8.8%), *Giardia muris*4(11.7%) and*Emeria sp*. 2(5.8%), table 2. The first study about rodent intestinal parasites in Iraq was done bySenekji, 1940 *[9]*, he found that 2.1% of 1000 patients examined in Iraq were infected with *H.nana*. Previously some studies in Iraq recorded so many types of parasites in houses mice[10], [11] [12].

The first study in Erbil city was done byHussein,1986[10], during the examination of 232 micecollected from different localities in Erbil city Kurdistan Iraq. Two typesofcestode intestinal parasites was detected in present study identified as *H. nanaand H.diminuta*with thehighly percentages of infection 8(23.5%) and 8.8% respectively, table2. A cestode tapeworm requires at least two hosts in order to survive and complete its life cycle, the primary host often carries the larvae that live in the tissue of the host; they are then transmitted to the secondary host, developing to adult stage in the intestine of this final host. Recent studies have shown that *H. nana* was commonly found in mice high frequently. Many cestodes tapeworms are host specific and some may only require one host to complete their whole life cycle [13]. In the present study we found the infection with *H. nana* (32.3%) were higher than that recorded by [14], in the same area which were (14.3%). The cestode *Hymenolepis nana* has very medical importance in children infections among the world, and was recorded previously in Iraq for the first time by [15] during the examination of patients attended to the therapeutic clinic of the medical institute in Baghdad city with percentage (2.6%), and was recorded in children at the first time in Erbil city by [16], during the examination of stool samples of 512 patients representing four sections of the population in Erbil city, and by [15] with percentage (3.0%), and by [16], in school children of Erbil city Northern Iraq. the results of this cestode that recorded in our study were higher compared to the study recorded previously by (1) in mice of suburban areas of Hamadan City in Iran they found *H. nana*(16.67%).About contamination of vegetable with the eggs of *H.nana,* recently Saida and Khider[18],they foundduring the examination of parasitic agents (stages) in six leafy vegetables collected from different markets of Erbil City, they found that (10.2%), of vegetables were contaminated with the eggs of the parasite. In this survey we recorded two types of intestinal nematodes *Aspicularistetraptera* and *Syphaciaobvelata* with percentage (11.7%) of each one. The finding of these two nematodes were lower than recorded previously in houses mice in the same area by [10], with the incidence of infection (19.0%) and (17.1%) respectively. Four types of intestinal protozoa were recorded in this study, with total of infection 15

(44.1%), out of total of these protozoa recorded *Entamoebamuris* 6(17.6%)and *Giardia muris* 4 (11.7%) were higher prevalence than *Tritrichomonasmuris* and *Emeria sp.*3(8.8%) and 2(5.8%) respectively. Previous study these intestinal protozoans was recorded in rodents of Erbil city,[19],they recorded many types of intestinal protozoans parasites which were higher than finding of our study andthese were as follows:*Trichomonasmuris*(56%)with the higher incidence, followed by *Scyphaciamuris* (24%), *Giardia muris* (12%), *Hexamitamuris* 8% and the least percentage of infection was (4%) for *Entamoebamuris.* About multiple parasitic infections we found thatthe single type was highly prevalence 20 (58.8%) table 3, compared with those of double and triple infections10(29.4%) 4(11.7%) respectively, the finding of our study is agreement with previously recorded in the same area,[19] they found that single parasitic infections were higher than double and triple infections.

Conclusion and recommendations

In this study we found that increasing number of rodent population in these five area of Erbil city especially in Hayaskary district, were highly infected compared with the other localities of the study areas.These parasites can be directly related to the increased zoonotic diseases in human population and his livestock, so our recommends are to control these rodents periodically especially in mini shops, supermarkets and houses, to decrease the risk of these rodents from human infection we need control these animals periodically and continuously.

References

[1] Ali, Y., Ali E., Iraj M. Sadegh R., and Hooman R. *"Helminth Infections of House Mouse (Musmusculus) and Wood Mouse (Apodemussylvaticus) from the Suburban Areas of Hamadan City, Western Iran"*. Iran J.Parasitol. Vol. 9, No.4, pp 511–518. (2014).

[2] Stojcevic, D., Z. Mihaljevic and A. Marinculic. *"Parasitological survey of rats in rural regions of Croatia"*. Vet. Med. Czech, Vol. 49, pp 70-74. (2004).

[3] Bradshaw, J. *"Know your enemy"*. Environ. Health. Vol. 107, pp 126-128. (1999).

[4] Mushtaq-Al-Hassan, M., I. Hussain, B. Shehzadi, M. Shaheen, M. S. Mahmood, A. Rafique and M. Mahmood-ul-Hassan. *"Occurrence of some zoonotic microorganisms in faecal matter of house rat (Rattusrattus) and house mouse (Musmusculus) trapped from various structures"*. Pakistan Vet. J., Vol. 28, pp 171-174. (2008).

[5] Klimpel, S., Förster, M., and G. Schmahl.*"Parasites of two abundant sympatric rodent species in relation to host phylogeny and ecology"*. Parasitol. Res. Vol. 100, pp 867-875. (2006).

[6] Soulsby EJL. *"Helminths, arthropods and protozoa of domestic animals"*. Sixth Edition.Pub.Bailliere, Tindall & Cassel Ltd., London, UK. pp824. (1969).

[7] Yamagoti, S. "*SystemaHelminthum*". Vol. II. The cestodes of vertebrates, 860 pp.New York and London. Int. science Publishers, Inc.(1959).

[8] Yamagoti, S. *"SystemaHelminthum"*. Vol. III. The Nematodes of vertebrates, Part I, pp 679, part II, PP.681-1261. New York and London. Int. science Publishers, Inc. (1961).

[9] Senekji, H.A. *"Bacteriology and parasitological survey of rates in Iraq"*. Trans. R. Soc.Trop. Med.Hyg., Vol. 33, pp 655-657. (1940).

[10] Hussein, M.M. *"A Survey of Some Endoparasites of House Rodents in Erbil Area"*. M.Sc. thesis, Science College, Salahaddin University-Erbil, pp.85, (1986).

[11] Jawdat ,S . Z .and Mahmoud ,S. N *"The incidence of cestodan and acanthocephalan Kamiya, parasites of some rodents in Iraq"*. Bull. Nat. Hist. Res. Center. Iraq. Vol. 7, No. 4, pp 55-71. (1980).

[12] Al-Hadithi , I.A. ;Habash ,A. H. and Alwan ,M. J.*"The incidence of helminth parasites of digestive tract of Rattusnorvegicus from Basrah area,Iraq"*. JBSR. Vol. 16. No. 2, pp 137-154. (1985).

[13] Heyneman, D. *"Medical microbiology"*. (Cestodes.Ins.Baron. Ed.). (4th ed.). Galveston (TX): University of Texas Medical Branch at Galveston.Chapter 89. Retrieved from: http:// www.ncbi.nlm.nih.gov/books/NBK pp 8399. (1996).

[14] Bailey, V. M. A. *"Cursory examination and comparison of stool examination methods"*. Bull. End. Dis., I, pp 295 - 298. (1956).

[15] Kadir, M.A.; Kader, A.A. and Faraj, K.K. *"Survey study of intestinal parasites among different population of Erbil city"*. J. Fac. Med. Bagh., Vol. 29, No. 4, pp 455-458. (1987).

[16] Ahmed, Q.M. *"Prevalence of intestinal parasites among food handlers and primary school children in Erbil province with initial cultivation of E.histolyticaSchandinn,1903"*. MSc Thesis.Salahaddin University-Erbil (2006).

[17] Molan, A.L. and Farag, A.M. *"Prevalence of intestinal parasites in school children of Erbil – Northern Iraq"*. Saud. Med. J., Vol. 10, No. 2, pp 107-110. (1989).

[18] Louis A. Saida and Khder N. Nooraldeen.*"Prevalence of parasitic Stages in Six Leafy Vegetables in Markets of Erbil City, Kurdistan Region-Iraq"*. Zanco Journal of Pure and Applied Sciences Vol.26, No.2, pp 25-30. (2014).

[19] Rezan K. Ahmed, Qaraman M.K. Koyee and Zohair I.F. Rahemo. *"Intestinal Parasites of Experimental Rodents with, Testing the Efficacy of Diagnostic Methods"*. Int. Res. J. of Pharmaceuticals, Vol. 02, Issue 03, pp. 77-81. (2012).