

The presence of protozoal cysts and helminthic ova on Vegetables collected from Baghdad markets

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Summary

The vegetables are considered as an important source of human infection with intestinal parasites.

Aims: *to try a detection of the protozoal cysts or helminthic ova from vegetables collected from Baghdad markets.*

Methods: *The study was carried out during three months 1st of September to the end of November 1999. Four different kinds of vegetables were selected for this study including tomato, onion, cucumber and celery. The vegetables soaked and washed in saline, centrifuged and the sediment examined for the presence of protozoal cysts, helminthic ova or fungi.*

Results: *Ova of **Ascaris lumbricoides** and **Enterobius vermicularis** were isolated from tomato and celery. Hookworm ova were isolated from celery leaves. **Entamoeba histolytica** cysts were present on tomato, celery and cucumber. **Giardia lamblia** cysts found on tomato and celery. In addition, the monilia (**Candida albicans**) and **Geotrichum candidum** were isolated from tomato and celery.*

Conclusion: *Vegetables may play an important role in intestinal parasites infection.*

Keywords: *Intestinal parasites, vegetables*

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Introduction

The importance of the intestinal parasites as causative agents of human disease is frequently overlooked especially in temperate climates when they are less common and their effects on the human host less marked than in the tropics and subtropics⁽¹⁾. Research institutions are devoting increasing attention to the solution of diseases caused by the parasites and their treatment⁽²⁾.

In Iraq, few studies on the intestinal parasites have been conducted during the past fifty years^(3, 4, 5, 6, 7, 8). The aim of this study is a trial to detect the protozoal cysts or helminthic ova from different kinds of vegetables collected from different markets in Baghdad city. This study was planned in views of the foregoing studies on the intestinal parasites and suggestion by many investigators that vegetables may play an important role in the transmission of these parasites causing diseases.

MATERIALS AND METHODS

This study was conducted during three months 1st September to the end of November 1999. The material for the presence of protozoal cysts and helminthic ova on the surface of raw vegetables, six markets from different areas of Baghdad city were selected. The markets includes: AL-Dora market, Karrada Al-Sharkia market, New Baghdad market, Al-Kadhimiya market, Shawaka market and Al-Hai market at Al-Sadr city.

Every market was visited only once. In each visit, one kilogram was bought from each kind of vegetables studied. The vegetables include tomato, onion, cucumber, and celery. The vegetables were brought to the laboratory, soaked separately in one liter of normal saline solution for 15 minutes and washed carefully in the same solution. The solution was centrifuged and the sediment examined for the presence of protozoal cysts or helminthic ova or any other microorganisms which might be present on vegetables like fungi.

Protozoal cysts and helminthic ova were identified morphologically by microscopical examination of direct wet films. Ova similar to that of hookworms were identified as human hookworms by culturing ova collected in Petri-dishes with charcoal

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according to the method of Headlee (9), and identified by the key given by the expert committee of WHO in helminthiasis (WHO, 1963) (10). The budding cells of monilia were identified as candida albicans by culturing on sabouraud's agar medium and subcultured in human serum or rice water for the production of germ tube. Barrel-shaped spores were identified as Geotrichum candidum by culturing on sabouraud's medium.

RESULTS

The results obtained from the examination of raw vegetables for the presence of protozoal cysts, helminthic ova and fungi were presented in table 1. From the data presented in this table, it can be seen that ova of *Enterobius vermicularis* and cysts of *Entamoeba histolytica* were recovered from celery leaves at Al-Dora market. At Karrada market, only *E. histolytica* cysts were detected from celery. On the other hand, at New Baghdad market, *Ascaris lumbricoides* ova and *E. histolytica* cysts were detected on celery leaves. In this market also, *E. vermicularis* ova were found on celery. At Al-Kadhimiya market, *A. lumbricoides* ova were found on tomato and celery, and *E. vermicularis* ova and *E. histolytica* cysts were detected from celery. Moreover, at this market, ova similar to that of hookworm were recovered from celery, which were identified after cultivation as a human hookworm *Ancylostoma duodenale*. Also, *Geotrichum candidum* was detected from tomato and celery at this market. At Shawaka market, *A. lumbricoides* ova were recovered from tomato and celery, *E. vermicularis* from celery, *E. histolytica* cysts from tomato and celery, and *Giardia lamblia* cysts and *G. candidum* from celery; in addition, monilia which was identified as *C. albicans* recovered from tomato. At the Hai market in Sadr city, *A. lumbricoides* ova were recovered from celery, *E. vermicularis* ova and *G. lamblia* cysts from tomato and celery, and *E. histolytica* cysts from tomato, cucumber and celery. Moreover, monilia (*C. albicans*) and *G. candidum* recovered from tomato and celery bought from this market. In addition, no cysts, ova or fungi detected on onion collected from the markets examined.

DISCUSSION

In Iraq, the infection with intestinal parasites is common. From this point of view, this research is carried out.

The only data related to the finding of protozoal cysts or helminthic ova from vegetables is that of Fathallah (11) , who found *A. lumbricoides* ova on onion, mint, parsley, and celery. In our study, the ova of this parasite were detected from tomato and celery. Jeffery (12) mentioned that the infection with *A. lumbricoides* often follows ingestion of egg stage in raw vegetables especially if human faeces has been used as fertilizers. This method is widely used in this

country. Moreover, often intestinal parasites including *E. vermicularis*, *E. histolytica*, and *G. lamblia* which were recovered in several occasions were not detected by Fathallah (11). In this country, it is worthwhile to mention that there is hardly anyone who has not been a victim of enterobiasis in some part of his life.

In relation to microorganisms other than intestinal parasites, monilia which was identified as *C. albicans* was recovered from tomato and celery in two markets, namely Shawaka and A-Hai markets. Fathallah (11) found this fungus on tomato from three markets. It is well-known that moniliasis is very common in this country especially in children below five years of age (unpublished data)(13). Meanwhile, geotrichosis due to *G. candidum* is also found in adult and children. This intestinal fungus was also found on tomato and celery from three markets studied.

From the data obtained in this study, it can be said that there is apparently a definite relationship between intestinal parasites infections and the type and amount of vegetables consumed. In addition there are some people who eat raw vegetables without washing. In Iraq, in the cultivated fields, facilities for the disposal of human excreta were almost non-existent. The corners of cultivated lands were commonly used as defecation sites. In addition, the practice of using human excreta as a fertilizer is also responsible for contamination of vegetables. It is obvious therefore, that the pollution with protozoal cysts, helminthic ova and intestinal fungi is everywhere in the defecation sites, which cause the contamination of vegetables in the field and the pollution is accelerated by flies, animals and human feet and hands. Moreover, the customs and habits of the human host may also affect the presence of specific diseases due to intestinal parasites. In Iraq, the habits of eating uncooked vegetables which may be contaminated with or contain the infective stage of various intestinal parasites leads to a high incidence of infection especially amoebiasis where their cysts were detected on vegetables especially on celery from all the markets visited. In the light of these findings, it can be said that vegetables may play a great role in intestinal parasites infection. It is recommended that vegetables should be washed carefully with warm water and soap followed by washing with tap water several times to reduce the infection with intestinal parasites.

REFERENCES:

- 1- Strong, R. P. "Stitt's diagnosis, prevention and treatment of tropical disease ", 1944, 7th Ed. The Blakston Co., Philadelphia.
- 2- Belding, D. L. "Text Book of parasitology",
- 3- 1965, 3rd Ed., Appleton-Century Croft, New York.

- 4- Senekji, H. A., Boswell, C. and Beattie, C. P. The incidence of intestinal parasite in Iraq. *Trans Roy. Soc. Trop. Med. Hyg.* 1939, 33: 349.
- 5- Al-Dabagh, M. A., Shaheen, A. S., Zaki, D. A. and Abdullah, M. Giardiasis in group of preschool age children in Iraq. *J. Fac. Med. Baghdad*, 1967, 9: 73-83.
- 6- Niazi, A. D., Al-Issa, T. B. and Khamis, F. Studies on the prevalence of *Entamoeba histolytica* in Iraq. *Bull End. Dis. Baghdad*, 1976, 17: 127-141.
- 7- Al-Jeboori, T. I. and Shafiq, M. A. Intestinal parasites in Baghdad. A survey in two districts. *J. Fac. Med Baghdad*, 1976, 18: 161-170.
- 8- Abbas, E. M., Mhaisen, F. T. and Al-Tae A. Incidence of intestinal parasites among pupils of ten primary schools in Baghdad city. *Ibn Al-Haitham J. pure and Appl. Sci.*, 2000, 13: 11-19.
- 9- Kadir, M. A., Al-Nooman, N. N. and Al-Samaraie, H. M. A study on protozoal diarrhea in Samarra district. *J. Fac. Med. Baghdad*. 2000; 42: 678-686.
- 10- Headlee, M. W. The epidemiology of human *Ascaris* in the metropolitan area of New Orleans, Louisiana. *Amer. J. Hyg.* 1936; 24: 479.
- 11- W.H.O. "African conference on Ancylostomiasis", 1963. CCTA/Tech. Rep. Ser. No. 255: 29
- 12- Fathallah, Z. I. The presence of human parasites in vegetables collected from different markets in Baghdad city. Thesis, Dip. Comm. Med., Coll. Med. Uni. Baghdad, 37pp.1988.
- 13- Jeffrey, O. M. Study of intestinal helminthes infection in a coastal South Carolina area. *Public Health Rep.* 1963, 78: 45 Abst. In: *Trop. Dis. Bull.*, 1964.
- 14- Guirges, S.Y. Intestinal parasites in patients attending Medical City Teaching Hospital in Baghdad with special reference to dysentery due to free-living amoebae. 2005. (Under publication).

Markets	Intestinal parasites						
	<i>A. lumbricoides</i>	Hookworm	<i>E.vermicularis</i>	<i>E.histolytica</i>	<i>G.lamblia</i>	Monilia	<i>G.candidum</i>
Al-Dora	-	-	(+) ⁴	(+) ⁴	-	-	-
Karrada Sharkia	-	-	-	(+) ⁴	-	-	-
New Baghdad	(+) ⁴	-	(+) ⁴	(+) ⁴	-	-	-
Kadhimiya	(+) ^{1,4}	(+) ⁴	(+) ⁴	(+) ⁴	-	-	(+) ^{1,4}
Shawaka	(+) ^{1,4}	-	(+) ⁴	(+) ^{1,4}	(+) ⁴	(+) ¹	(+) ⁴
Al-Hai	(+) ⁴	-	(+) ^{1,4}	(+) ^{1,3,4}	(+) ^{1,4}	(+) ^{1,4}	(+) ^{1,4}

(1) Tomato

(2) onion

(3) cucumber

(4) celery

Table (1): Incidence of protozoal cysts, helminthic ova and fungi isolated from vegetables from six different markets of Baghdad city