Epidemiological Study of Prevalence of Balantidium Coli among Children Inflicted with Diarrhea in Missan Governorate; for the First Time in Missan

دراسة وبائية لانتشار طفيلي القربيات القولونية Balantidium coli لعينات من براز اطفال يعانون من الإسهال لأول مرة في محافظة ميسان

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الخلاصة

الخلفية : طفيلي القربيات القولونية هو النوع الوحيد من الهدبيات الممرض للإنسان حيث يصيب الأمعاء الغليظة ويسبب تقرحات في مناطق مختلفة.

الهدف: تهدف الدراسة الى تحديد انتشار الطفيلي ووصف مراحله وإيجاد العلاقة بين الاصابة ب Balantidium Coli وبين المعلومات الديموغرافية للأطفال المصابين.

المنهجية: تم جمع (138) عينة براز من الأطفال عن طريق المصادفة وتم إجراء الفحص الروتيني في المختبرات الأهلية و تراوحت أعمار الأطفال المصابين بين (6 أشهر10- سنوات) ومن مناطق مختلفة من محافظة ميسان، تم فحص العينات خلال ساعة بعد جمعها وباستخدام المسحة الرطبة المباشرة لعينات البرازوصبغت باستخدام Lugol`s Iodine.

النتائج:أظهرت النتائج إصابة (7) بطفيلي القربيات القولونية وبنسبة (5%) من مجموع الأطفال الذين تم فحصهم ، أعلى نسبة إصابة سجلت في الأعمار مابين (6-12) أشهر وبنسبة (8.8%)4 ، بينما سجلت اقل نسبة إصابة للأعمار مابين (3-5) سنوات، ولم تسجل أي إصابة في الأعمار مابين (6- 10) سنوات. أظهرت الدراسة وجود فروقات لنسب الإصابة بين الأعمار عند مستوى معنوي (P< 0.05) وكذلك أظهرت الدراسة عدم وجود فروقات معنوية لجنس الأطفال على معدل الإصابة بالطفيلي، أعلى إصابة بالطفيلي كانت قد سجلت في منطقة حي العامل (3 حالات) ، تم تشخيص طور الناشطة والطور المتكيس لطفيلي القربيات القولونية في براز الجرذان أخذت من منطقة حي العامل.

الاستنتاج : سجلت هذه الدراسة وجود إصابات بطفيلي القربيات القولونية لأول مرة في محافظة ميسان، لذلك نعتقد ان الوافدين وخصوصا من مناطق شرق أسيا (العمالة) مع الشركات العاملة في المحافظة ربما هم العامل الرئيس لانتشار الإصابة بالطفيلي كما ان وجود مقرات لهذه الشركات بالقرب من الأحياء السكنية قد يكون له دور في انتقال الطفيلي عن طريق مياه التصريف الصحي والمجاري وكذلك عن طريق الجرذان التي تعتبر مضائف خازنه للقربيات القولونية .

التوصيات : توصي الدراسة بوضع خطة عمل شاملة لتحديد وتعيين ومنع انتشار الطفيلي في محافظة ميسان, كذلك إجراء فحوصات للوافدين من شرق أسيا مع الشركات العاملة في المحافظة الذين ربما يكونون العامل الرئيس لانتشار الإصابة بالطفيلي

Abstract:

Background: Parasite Balantididae coli is the only kind of Alhdbeat pathogenic to humans, where infects the large intestine and causes ulcers in different regions.

Objectives: The study aims to determine the prevalence of the parasite called the stages and find a relationship between injury to Balantidium Coli and the demographic information of the infected children

Methodology: The collection of 138 stool samples from children by accident and through routine testing in the civil laboratories and age of infected children ranged from (6 months-10 years) and from different areas of the province of Missansamples were examined within an hour after collection and using the swab direct wet stool samples direct stool examination and dyed using Lugol`s Iodine.

Results: The results showed the injury (7) parasite Balantididae coli and (5%) of all children screened, the highest infection rate recorded in the ages between (12-6) months and by 4 (8.8%), while the lowest rate of injury for the ages between (5 3) years, and did not record any injury between the ages (10-6) years. The study showed a difference of infection rates between the ages when the level of significance (P <0.05).The study showed no significant differences for child sex on the incidence of the parasite rate, the highest infection parasite had been recorded in the Amil neighborhood (3 cases), have been diagnosed with active and mutant developed Almtkis parasite Balantididae coli in the feces of rats were taken from the Amil district area.

Conclusion: recorded this study, the presence of injuries parasite Balantididae coli for the first time in the province of Maysan, so we believe that the arrivals, especially from East Asia (employment) with operating in the province companies probably are the main factor for the spread of the parasite also that the presence of the headquarters of these companies near residential neighborhoods It may have a role in the transmission of the parasite through water sanitation systems and sewage as well as by rats that are AmadaivKhasenh for Qrabiyat coli.

Recommendations: develop a comprehensive action plan to identify, recruit and prevent the spread of the parasite in the Maysan province conducting tests arrivals from East Asia with companies operating in the province are probably the main factor for the spread of the parasite.

Keywords: Balantedium coli, fecal sample, children, diarrhea.

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INTRODUCTION

Balantidium coliis a ciliated protozoan parasite, measured (50-200µ) in length and (40-70µ) in width and it is only member of the ciliate group that is pathogenic for human which can causes Balantidiasis or Balantidial dysentery in human[1,2].

Balantidium coli is an oval, ciliated,actively motile, contain a large kidney shaped macronucleus and micronucleus maybe found near the concavity of macronucleus also contain two contractile vacuoles and food vacuoles[3].

Balantidium coli is worldwide distributed, the infection can be transmitted by the ingestion the cyst (infective stage) with contaminated food and water , person to person infection may occur including through food handlers[2].

The pigs and less commonly monkeys and rodents are the most important reservoirs for the parasite. But, it is not known if the rats Balantidium species can infect the humans. Many of the domestic and wild animals may work as reservoirs or carriers to the parasite like the cattles, buffaloes and camels in addition to pigs and monkeys[4] The cockroaches may serve as mechanical vector for transmission the Balantidium coli to the human [5].

The factors that lead to the pathogenicity of Balantidial coli are varied ,but usually related with lower the resistance of the host especially in children, therefore theBalantidium coli may be opportunistic organism and cause serious illness by invasion of mucosa and sub mucosa of the intestine [6] .

Schast (2007) reported two cases of the women who have theBalantidium coli in the urinary tract and vagina,and one of which the organism that has been implicate as causative agents of cystitis secondary toBalantidium coli dysentery[7].

The clinical feature characterized by abdominal pain, tenderness ,tenesmus anorexia and watery diarrhea mixed with mucous, blood and pus materials,poor weight gain[2].

The diagnosis depends on the demonstration of trophozoits and cysts in the diarrhea stool by microscopic examination of direct saline wet mount [8].

The treatment with Tetracycline and Metronidazole is safe and effective and probably represents the preferable of mode of the therapy [3].

The aim of this study is to know the prevalence of Balantidium coli in children from different regions in Missan Governorate .

MATERIAL AND METHODS

The fecal samples were collected accidentally in Specialist laboratories through the routine examination from(138)children female (50)and male (88), suffering from colic and abdominal pain, watery diarrhea mixed with blood and mucosa .

The children aged between (6monthes to 10years)came from five different regions(AL-Hussein Quarter, AL-MajddiaQuarter, AL-AscarryQuarter, AL-AmmelQuarter and AL-KahlaaQuarter).

15-30 grams of freshly stool were taken from each patient and put in plastic container with high tide. Each fecal sample were examine within one hour by direct microscopic examination using staining method with Logal`s iodine that described by Soulsby[(9)]for stool examination. Balantidium coli was identified on the bases of cysts and trophozoites morphological features

Statistical analysis: Descriptive statistical methods was used for data analysis and Chi – Square in ($P < 0.05$).

RESULTS:

Through the examination of (138) fecal samples from the children accidentally by using direct stool examination and staining with Logal`s iodine .only (7) children showed infection with Balantedium coli with percentage (5%), There is no significant difference according to sex of children on the rate of infection, Females(42.8)and Males(57.1).

The highest infected rate was found in ages between (6-12) months in percentage (8.8%), while the lowest infection was found in ages between (3-5)years in percentage (4%).The infection with Balantedium coli was not recorded in ages between (6-10)years, fig(1).

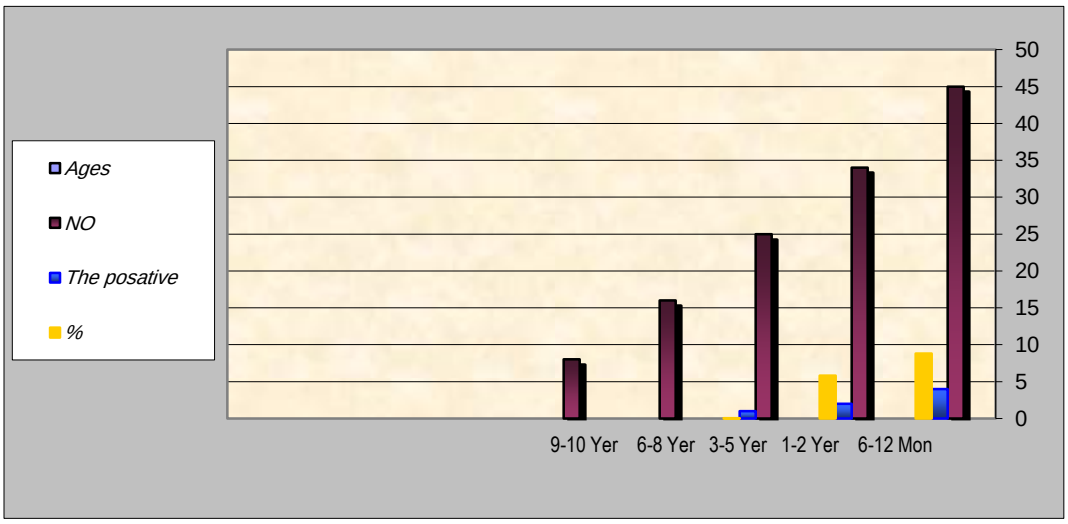


Fig (1) relationship between the children ages and the infection by Balantidium coli[NO:138].

Most cases of the infected children with Balantedium coli were found in AL-Ammel.Q(3cases) Table (1).The trophozoite and cyst stage were isolated from the fecal samples of the rats in AL-Ammel.Q.

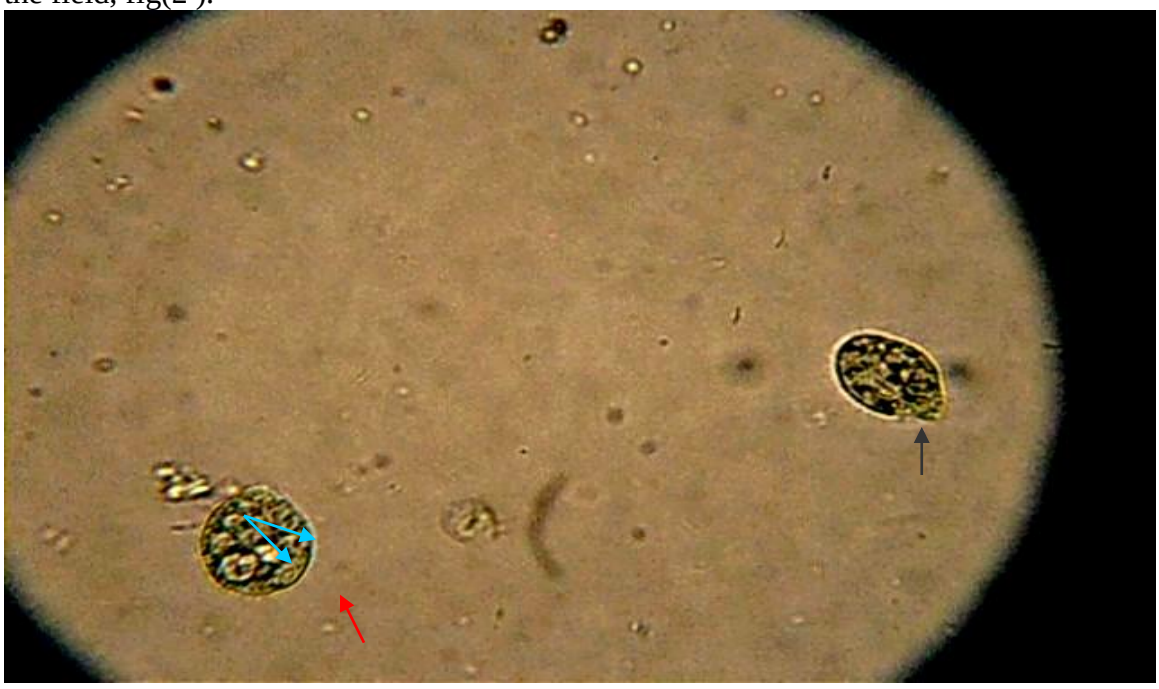
Table(1) Number and percentage of infected children with Balantidiun coli from different regions in Missan governorate[NO:138].

Residence of the patients	No of children	No of infection	Percentage of infection
AL- HusseinQ	34	1	2.9
AL- MajddeaQ	14	1	7.1
AL-Ascarry Q	8	1	12.5
AL- Ammel Q	63	3	4.7
AL- Kahlaa Q	19	1	5.2
The total	**138**	**7**	**5%**

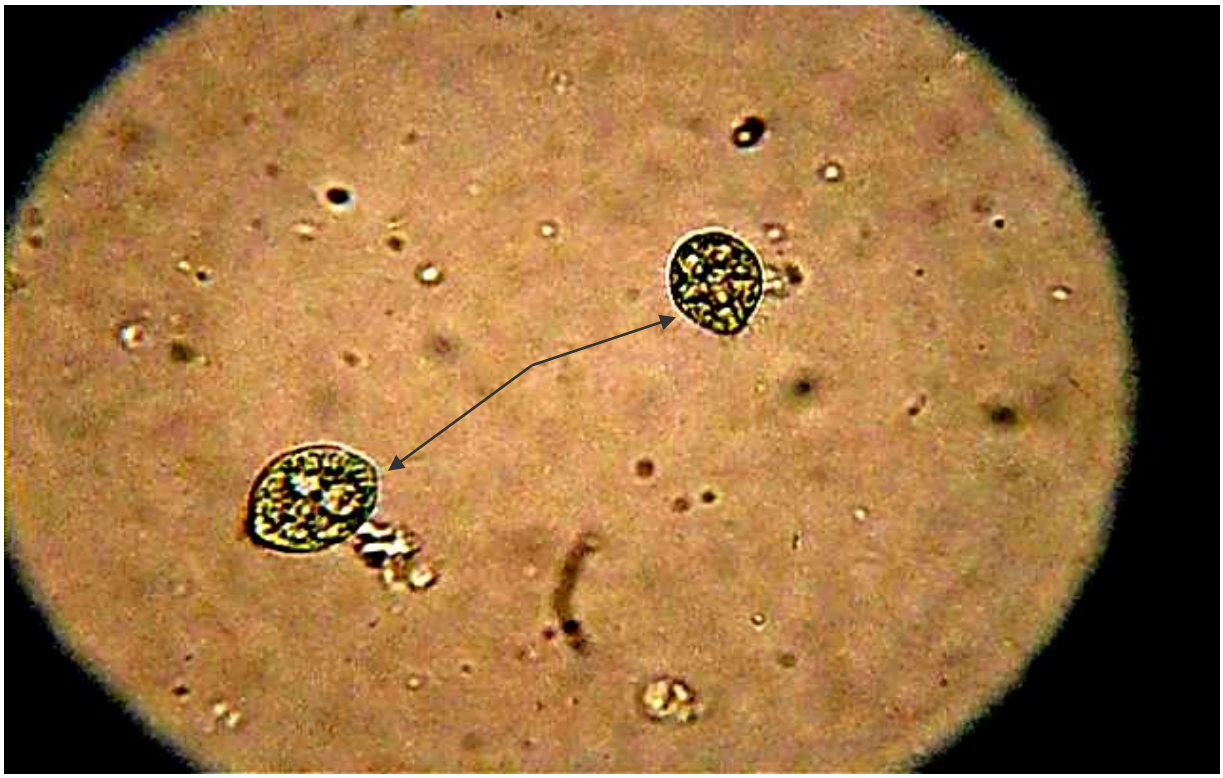
Description of the Parasite

Both the trophozoite and cyst stages were noted by using direct stool examination with lugol`s iodine staining:

1) The trophozoite stage appeared oval in shape with brown in color, covered with cilia that more obvious around the mouth orifice, actively motile and moving very rapidly across the field, fig(2).

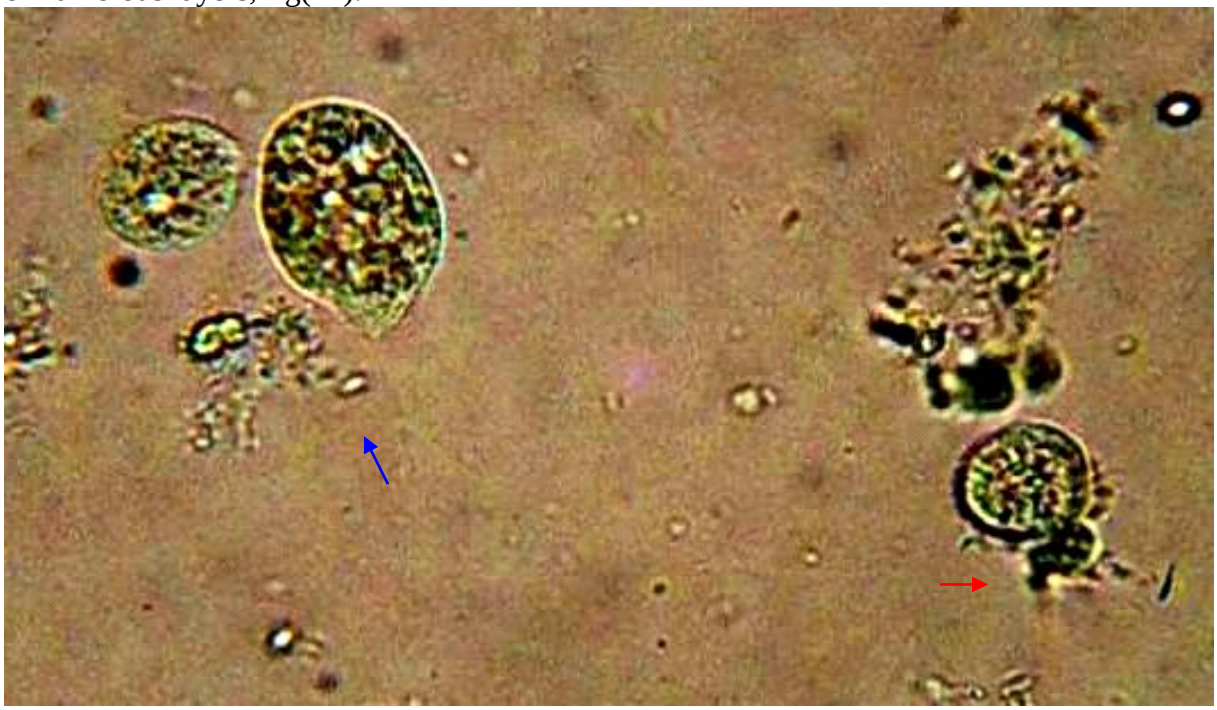


Fig(2) the trophozoite stage of Balantidium coli which appear oval in shape and covered with ciliathat more obvious around cytostome →, contain contractile vacuoles and cytopyge →.[400x]



Fig(3) the trophozoite stage of Balantidium coli which is covered with cilia (characteristic feature of this parasite), [400x]

2) The cyst stage appeared rounded with brown color and bounded by shell that composed of numerous layers, fig(4).



Fig(4) shows A: Cyst stage of Balantidium coli → which appeared converted by thick shell, also we can see B: Trophozoite stage during engulfing the food materials. [400x]

DISCUSSION

According to the data and our knowledge, this study is considered the first record of Balantidium coli in the Missan Governorate, and should be mentioned that there were limited studies that deal with the disease in Iraq especially in children.

During the stool examination that was obtained from (138) child, only in a study cases showed infection with Balantidium coli of all examined cases[7]. This results agreed with that observed low percent with Balantidium coli (2.14%) in a study performed on (1350) children from the urban and rural areas in AL-Najaf Governorate[8].

In study was performed in Peruvian Amazon show a high percentage of infection with Balantidium coli (6%) of all population [10].

In one large study done in America for (3600)patients suffering from diarrheal disease, the incidence of Balantidium coli was recorded only in (0.44%), this low incidence of the infection and failure to transition the disease experimentally suggest that man has a high resistance to the Balantidium coli[3].Most cases of infection were found in ages between (6-12)months, while the low percent was recorded in ages between (3-5)years, in contrast the infection were not recorded in ages between (6-10)years.

These results agreed with previous study that observed the increase of the risk of infection with Balantidium coli rapidly in ages between (>6-12) months because at this time the infants start crawling and have the habit of putting the objects in their mouths, also added that the low infection in ages more than 12 months because the children begin to walk and have less ability to contaminate the hands as with crawling[8].

Balantidium coli infection has been reported from areas where poor environmental sanitation and low level of personal hygiene, and the high prevalence and epidemics of infection have occurred in mental institutions and children less than 5 years in Canada and United states [11].

The most cases were recorded in AL-Ammel.Q. The increase of the infection in this area most likely due to low socio-economic level, and the absence of proper sewage disposal system and contamination of tap water with the parasite.

The presence of parasites in the human feces, and increase of rodents in sewage water may give an indicator to the lack of toilet facilities in most homes, and the prevalence of Balantidium coli in human most often in individuals exposed to the poor environmental hygienic condition [12, 13].

The contamination of the drinking water may be considered an important mode for the transmission the cyst stages which may remain in drinking water supplies and damp soils for prolonged period [14].

Through the examination of fecal samples it is shown that the trophozoite stage is more visible and mostly found in all infected patients in comparison with the cyst stage.

These results agreed with another studythat said the diagnosis of Balantidium coli depend upon the demonstration of trophozoite stage in diarrheal stool which is large in the size with cilia, and large nucleus[3].

The trophozoite stage can potentially invade and penetrate the mucosa layer with cellular infiltration in the area of developing the ulcers [13].

Umesh(2007) referred that the Balantidium coli has the ability to secret Hyaluronidase enzyme which helps the parasite to invade mucosa and form lesions similar to these of amoebiasis leading to the perforation of the colon and, hepatic abscesses and appendicitis[15].

The Balantidium coli prefer an alkaline or neutral habitat and avoid acidic environments .Therefore, the parasite may invade the respiratory tract**[11].**

Balantidiasis is rarely found in Iraq because the normal reservoir (pigs) is seldom found.

CONCLUSION

This study the infection with Balantidium coli in Missan may came from the contaminated water, vegetables that enter from different countries ,also the arrivals to Iraq especially from East Asia with companies working inside the country may play important role in the distribution of the disease , in addition the presence of the seat center location of these companies near to the residential districts may cause transmission of the parasite through the rodents and sewage water where the trophozoite and cyst stages were diagnosed in feces of the rats in AL-Ammel.Q .

RECOMMENDATION

Develop a comprehensive action plan to identify, recruit and prevent the spread of the parasite in the Maysan province conducting tests arrivals from East Asia with companies operating in the province are probably the main factor for the spread of the parasite**.**

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