Journal of Natural Sciences Research www.iiste.org
ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online)
Vol.7, No.4, 2017

# Study on Prevalence of Giardia lamblia among Patients Attending Pediatric Hospital in Kirkuk City and Its Effect on Some Hematological Parameters

Lima Tariq Youash Khana
College of Nursing/ University of Kirkuk

Pakiza Said Fouad
Pediatric Hospital / Kirkuk city

Dena Nail Haddad
Pediatric Hospital / Kirkuk city

**Abstract:**
In this study we examined 3306 stool samples during the period from January to December 2015 from children attending pediatric hospital in Kirkuk city to show the prevalence of *Giardia lamblia* infection and its effect on some hematological parameters including packed cell volume(PCV) and white blood cell count( WBC) count especially in this period because security conditions in my country and increased the emigrants whom they live in tabernacles which lacking the healthy and hygiene conditions . The results showed that the total infection of *Giardia lamblia* was 7.1% (235 of 3306). According to the sex, the highest rate of infection occurred in males 4.53% (150 of 3306) while in females was 2.57% (85 0f 3306) and the rate of infection among males was 7.53% (155 of 1990) while the rate of infection among females was 6.45% (85 of 1316). There is significant differences appeared between males and females. According to the months, the high rate of infection occurred in October between males 17.5% (35 0f 200).The result showed that the high rate of infection with *Giardia lamblia* occurred in age group from 1 month to 3 years (120 of 235). Blood tests are done which include packed cell volume( PCV) and white blood cell count. The results show there are significant differences between infected patients and healthy persons, the (PCV) value decreased and (WBC) count increased between infected and non-infected persons respectively.
**Keywords:** *Giardia lamblia*, Prevalence , Hematological parameters, Kirkuk city.

## Introduction:-

*Giardia lamblia* was first discovered in 1681 by Antony van Leeuwenhoek, who found it in his own stool . This protozoan genus Giardia (Family Giardiidae , order Giardiida) is the most common flagellates of the human digestive tract causes giardiasis, which characterized by acute or chronic diarrhea and intestinal irritation, This species is so cosmopolitan but occurs most common in warm climate, Children are special susceptible(1).

The life cycle of *Giardia lamblia* consist of 2 stages ( The trophozoite and the cyst ).The trophzoite is pear- shaped with 2 nuclei, 4 pairs of flagella and a suction disc which it attaches to the intestinal wall, The oval cyst is thick walled with 4 nuclei and several internal fibers, each cyst gives rise 2 trophozoite during excystation in the intestinal tract(2).

Transmission occurs by ingestion of the cyst in contaminated food and water with feces. As few as 10 - 25 cysts are able to cause an infection in some humans(3). Excystation occur in the duodenum, where the trophozoite attach to the gut wall but does not invade, The trophozoite causes inflammation of the duodenal mucosa leading to malabsorption of protein and fat. Many of dividing trophozoite enter the colon and encyst as a response to bile salts and other stimuli (4). Cyst can detect in the feces from 3 days to 3 weeks after ingestion contaminated food and water, depending to the host species and can survive for long time in the environment under cool, moist conditions and chlorination does not kill cysts but filteration removes them ,also they are susceptible to desiccation and direct sun light, and are killed under hot and dry conditions(5).

*Giardia lamblia* can produce a wide spectrum of clinical manifestations, from asymptomatic to acute or chronic diarrhoea with malabsorption of fat, vitamins A , B12 , iron and weight loss, nausea, anorexia, flatulence and abdominal cramps persisting from weeks or months. (6). So this study is aimed to detect the prevalence of *Giardia lamblia* in children attending pediatric hospital for the period between September to December 2015 and the parasite effect on some hematological parameters such as packed cell volume( PCV) and White blood cell (WBC) count especially in this time because security conditions in my country and increased the emigrants whom they live in tabernacles which lacking the healthy and hygiene conditions .

## Materials and Methods:

Stool samples were collected from 3306 patients including 1990 males and 1316 females attending pediatric

hospital in Kirkuk city from 1st January to 31th December 2015. Stool sample was obtained from each patient in a plastic container, we examined it macroscopically by naked eyes and microscopically by direct general stool examination by using physiological saline and lugol's iodine solution with high power (40x) for detection of trophozoites and cysts stages for *Giardia lamblia* ( 7).

The Packed cell volume was estimated using microhaematocrit centrifuge.

White blood cells was counted by using Improved Neubauer chamber (hematocytometer).

The results were analyzed statistically using ANOVA ( Tukey test) was done to show the significant difference between infected and non-infected persons.

**Results and Discussion:-**

The current study showed that the total rate of infection with *Giardia lamblia* was 7.1% (235 of 3306) . According to the sex, the results showed no significant differences between males and females that infected with *Giardia lamblia.*The males is more infected with *Giardia lamblia* than females, The percentage of infected males 7.53% (150 of 1990) while in females 6.45% (85 of 1316) Table 1. This result is agree with ( 8) and (9) and disagree with (10), this may be due to both sexes are liable for infection with *Giardia lamblia.*

**Table (1): Distribution of *Giardia lamblia* according to the sex.**

| Sex | Male | Female | Total |
|---|---|---|---|
| **Examined samples** | **1990** | **1316** | **3306** |
| **+ve samples** | **150** | **85** | **235** |
| **%** | **7.53** | **6.45** | **7.1** |

According to the months the study showed that the highest rate of infection with *Giardia lamblia* occurred in October17.5% (35 0f 200) and this result is agree with (8) and (9), this may be due to increased of migration from regions that invasion by terrorist and the migrants live in poor hygiene and drinking contaminated water.

According to the age , the study showed that the highest rate of infection occurred with *Giardia lamblia* in groups between 3 months – 3 years 40.42% (120 of 235)and the reason of this high prevalence may be due to weakness of immune system lead to exposure to different pathogens such as bacteria, viruses, fungi and parasites (10), in addition poor health hygiene and education , low socioeconomic status especially among migrants and absence of playing areas so the children play near waste materials in places of their residences which enhanced infectious diseases(11).These result is agree with (12) and (13).

**Table (2): Distribution of *Giardia lamblia* according to the age.**

| Age | Examined samples | + ve samples | % |
|---|---|---|---|
| **1 month-3 years** | **1202** | **120** | **10.81** |
| **3 - 6 years** | **1130** | **73** | **6.46** |
| **6 – 9 years** | **653** | **30** | **4.59** |
| **9 – 12 years** | **321** | **12** | **3.73** |

Table ( 3 ) shows the changes in hematological parameters includes packed cell volume( PCV%) and white blood cells (WBC) count in patients infected with giardiasis and non-infected persons. The current study revealed decreased in (PCV) value in infected patients in comparison with non-infected persons, the average of infected patients is (29%) and the value ranging between( 28- 38%), while in non-infected persons the average is (40%) and the value ranging between (36- 41%) and there is significant differences between infected and non-infected groups. This result is agree with (14), and the reason is due to that giardiasis causes malabsorption of vitamins and fat in small intestine which lead to iron deficiency anemia and interfere with the growth of children causing developmental disorder which proved by (15) and (16).

Also the study showed there is significant differences in (WBC) count between infected patients with giardiasis and non-infected persons, the results revealed increased in (WBC) count in infected patients (9660 cell/$mm^3$) and decreased in non- infected persons (6960 cell/ $mm^3$), this result is agree with (17) because the function of white blood cell is fights pathogens such as bacteria, viruses ,fungi and parasites ,so white blood cells count elevated as immune response against parasitic infection(18).

**Table (3): Comparison of packed cell volume(PCV) and white blood cell (WBC) count between infected patients with *Giardia lamblia* and non-infected persons.**

| Hematological parameters | Infected patients | Non-infected persons |
|---|---|---|
| **PCV % ± SD** | **28.8 ± 3.9665** | **40 ± 1.5645** |
| **WBC count cell/$mm^3$ ± SD** | **9660 ± 942.4** | **6960 ± 1591.0** |
| **t- test (p≤ 0.05)** | **significant** | **significant** |

**References:**

1- Geraled , D.S., and Larry , S.R. (2005). Foundations of Parasitology . McGraw – Hill. Companies . New york .

7thEd. PP. 89- 93.
2 – Brooks, G.F.; Carroll, k. C. ; Butel ,JS. ;Morse, S. A. and Mietzner, T. A. Jawetz . Melnick and Adelberg .(2013). Medical Microbiology. McGrew- Hill Companies. 26 th Edition. PP. 719- 720.
3- Acha PN and Szyfres B (Pan American Health Organization [PAHO]). Zoonoses and communicable diseases common to man and animals. Volume 3. Parasitoses. 3rd ed. Washington DC: PAHO; 2003. Scientific and Technical Publication No. 580. Giardiasis; p. 52-56.
4 – Ensink, JH.; Vander, HW. and Amerasinghe, FP. (2006). *Giardia duedenalis* infection and wastewater irrigation in Pakistan. Trans. Soc. Trop. Med, Hyg., 100: 538-542.
5- The Center for Food Security & Public Health. Lowa Stast University.
http://www.cfsph.iastate/edu.
6. Mohammad, Y.; Saminullah, S. and Azmat, T. (2008). Frequency of *Giardia lamblia* Infection in Children with Recurrent Abdominal Pain. J. Pak. Med.Asso., 58 (4): 171 – 174.
7 -WHO.(1991).Basic laboratory methods in medicals parasitology.1st.Ed .Printed in England. Macmillan/Clays.
8- Ibrahim, A. Q.(2012). Prevalence of *Entamoeba histolytica* and *Giardia lamblia* in children in Kadhmiyah Hospital. The Iraqi J. Vet. Med. 36 (1):32– 36.
9- Hussien, AW.B.(2009). Sudy of prevalence intestinal parasite in patient visit some hospital of Baghdad. Anbar. J. Sci. 3(2): 1- 11.
10- Al-Saeed1, AT.; and Issa, SH. ( 2006). Frequency of *Giardia lamblia* among children in Dohuk, northern Iraq. Eastern Mediterranean Health Journal. 12( 5): 555-561.
11- Ulukanligil, M. and Seyrek, A. (2004). Demographic and socio-economic factors affecting the physical development, haemoglobin and parasitic infection status of school children in Sanliurfa province, Tur. Pub. Health, 118: 151-158.
12 - Al-Khaysee, GH.and Sultan, AA. ( 2008). The factors that effect the epidemiology of *Entamoeba histolytica and Giardia lamblia* among population of Khalis and Baledrose.Diala. J. , *27: 92-99.*
13 - AL-Shaheen, Z. et al. ( 2007). A study on prevalence of *Entamoeba histolytica* &*Giardia lamblia* infection among patient attending qurna hospital in Basrah. *J.Vet.Res*.,6(2):30-36.
14- Muhsin, S. N. (2004). A comparison between microscopical and ELISA technique in diagnosis of Giardia lamblia infection with epidemiological and biochemical among children under ten years in Tikrit district. M.sc. thesis. College of Science/ University of Tikrit.
15- Juma'a, EAM. (2006). Effect of *Giardia lamblia* infection on some biochemical changes of the human. Msc. thesis, Technical College/ Kirkuk.
16- Simsek, Z, et al. (2004).Effect on Giardia infection on growth and psychomotor development of children aged 0-5 years. J Trop Pediatr. 50:90-93.
17- Obaid, H. M.(2014). The Effect of *Entamoeba Histolytica* and *Giardia lamblia* Infection on Some Human Hematological Parameters. J. Natural .Sci. Res. 4(12): 44-48.
18- Heukelbach, J., et al. (2006). Leukocytosis and blood eosinophilia in a polyparasitised population in northeastern Brazil. Trans R Soc .Trop. Med *Hyg*., 100: 32-40.