

## Epidemiological study of Giardiasis and its impact on children blood picture

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### الخلاصة:

تناولت هذه الدراسة فحص 106 عينة دم و 350 عينة براز اطفال للفترة من بداية شهر حزيران ولغاية نهاية شهر تشرين الثاني 2010. أعلى نسبة اصابة للجيارديا لامبليا كانت 49.35% للاطفال الوافدين الى مستشفى ابو غريب بينما اقل نسبة كانت 26.11% للاطفال الوافدين لمختبرات الصحة المركزية.

لم تظهر نتائج الدراسة فرقاً معنوياً في نسب الاصابة بين الذكور والاناث الذكور 31.42% والاناث 32.14%. بينت نتائج الدراسة اصابة جميع الفئات العمرية فقد سجلت فئة 6-10 سنوات اعلى نسبة اصابة 66.66%، وكانت اقل نسبة اصابة في الاطفال بعمر 1 - 3 شهر 4.08%.

اظهرت الدراسة بعض التغيرات الدموية الواضحة المرافقة للاصابة الطفيلية مثل حجم الخلايا الدموية المرصوصة اذ بلغ معدلها في المصابة 39.14% وفي السليمة 31.91%، اما نسبة خضاب الدم فقد بلغ معدله في المصابة 11.87 غم/100 ميكرو لتر والسليمة 10.05 غم/100 ميكرو لتر، اما معدل عدد خلايا الدم البيض فكان في المصابة 700 خلية/مايكرو لتر والسليمة 785 خلية/مايكرو لتر.

### Abstract:

A total of 106 blood samples and 350 fecal samples were collected from children for the period from beginning of June till the end of November 2010 for this study. The higher infection of *Giardia. lamblia* was 49.35% in patients visit Abughraib hospital while the lowest was 26.11% patients visit central health laboratories.

There is no significant difference noticed between two sexes (male, female) the infected rate in male was 31.42%, while in female 32.14%. This study showed the relation between infection rate and the age, the age of 6-10 years old showed highest infection rate were 66.66% while the lowest rate of infection 4.08 % at age of 1-3months.

The study showed a clear effect of Giardiasis on rate of packed cell volume it was in infected children 39.14 % while in non infected 31.91%

There is also effect of Giardiasis on rate of children hemoglobin it was in infected 11.87gm /100 microlitter while in non infected was 10.05gm/100 microlitter.

This study showed effect of Giardiasis on Total white blood cells it were in infected children 700 Cells/microlitters while in non infected were 785 cells/microlitter.

### **Introduction:**

Giardiasis is one of the intestinal protozoa that cause public health problems in most developing countries as well as some developed countries. For decades, *Giardia* infection has remained one of the most common causes of waterborne disease (both drinking and recreational water) in humans and almost all vertebrates<sup>[1]</sup>.

*Giardia* infections are more common in warmer climates, though they may be found worldwide and in every region. In developing countries in Asia, Africa, and Latin America, approximately 200 million peoples have symptomatic giardiasis and the majority of them are children <sup>[2]</sup>. Many infected people can be asymptomatic which leads to difficulty in the eradication and control of this disease due to the number of potential carriers of *Giardia lamblia* <sup>[3]</sup>.

Iraq is among those countries in Asia that has a problem with infectious diseases due to intestinal protozoa. There are several reports on giardiasis showing consistently high prevalence in the rural areas of Iraq <sup>[4]</sup>. The aim of this study to show the percentage of Giardiasis and blood picture changes in children.

In this study, we examined the status of *Giardia lamblia* and its impact on children blood picture at Abughraib, Alyarmuk hospital, and Central health Laboratories patients.

### **Material and Methods:**

- 1 - Modified zielnelsine stain.
- 2 - Lugol's Iodine stain.
- 3 - Turks Solution.
- 4 - Drabkens Solution.

### **Parasite examination:**

350 Stool samples were collected from children aged one week to 10 years for both sex suffer from inflammation of stomach and intestine for the period from beginning of June till the end of November 2010. The specimens were tested by simple smear, logo's Iodine stain and by used modified zielnelsine stain.

### **Blood examination:**

106 blood samples were collected from same children, each sample was examined to measure packed cell volume (pcv) by using Microhematocrit, measure

hemoglobin by using Drabkens solution, and to measure total white blood cell count by using Microhematocrit.

**Result:**

A total number of 350 patients were included in this study. The prevalence of *G. lamblia* infection was higher in patients who visited Abughraib hospital with an infection rate of 49.35% compared to 27.58% of Alurmok hospital patients while the lowest in patients who visited Central health laboratories was 26.11% (table-1).

There is no significant difference in the rate of male and female infections it was in male 31.42% and 32.14% in female (table-2).

This study showed a relation between infection rate and the age, the age of 6-10 years old showed highest infection rate were 66.66% while the lowest rate of infection 4.08% at age of 1-3 months (table-3).

The study showed a clear effect of Giardiasis on rate of packed cell volume it was in infected children 39.14% while in non infected 31.91% (table-4).

There is also effect of Giardiasis on rate of children hemoglobin it was in infected 11.87gm/100 microlitter while in non infected was 10.05gm/100 microlitter (table -5).

This study showed effect of Giardiasis on Total white blood cells it were in infected children 700 Cells/microlitters while in non infected were 785 cells/microlitter (table-6).

<b>Territory</b>	<b>Total stool samples</b>	<b>Infected samples</b>	<b>Percentage %</b>
<b>Abughraib hospital</b>	77	38	49.35%
<b>Alurmok hospital</b>	116	32	27.58%
<b>Central health laboratories</b>	157	41	26.11%
<b>Total</b>	350	111	31.71%

**Table-1: The percentage of infected samples**

<b>Sex</b>	<b>Total samples</b>	<b>Infected samples</b>	<b>Percentage %</b>
<b>Male</b>	210	66	31.42%
<b>Female</b>	140	45	32.14%
<b>Both</b>	350	111	31.71%

**Table-2: The percentage of infected samples according to sex**

Age	Total sample	Infected samples	Percentage %
1-3 months	49	2	4.08%
3-6 months	44	9	20.45%
6-1 years	63	10	15.87%
1-2 years	65	20	30.76%
2-3 years	39	12	30.76%
3-6 years	42	26	61.90%
6-10 years	48	32	66.66%

**Table-3: The percentage of infected samples according to age**

Total blood samples	Infected %	Non infected %
106	39.14 ± 5.02	31.91± 0.74

**Table 4: The effect of infection on percentage of packed cell volume**

Total samples	Infected gm/100 microlitter	Non infected gm/100 microlitter
106	11.87± 1.55	10.05± 0.21

**Table 5: The effect of infection on percentage of hemoglobin**

Total samples	Infected gm/100 microlitter	Non infected gm/100 microlitter
106	7.00 ± 0.33	7.85 ± 0.59

**Table 6: The effect of infection on percentage of Total white blood cells**

### Discussion:

In this study 27.7% of children were infected with *G. lamblia* this finding was similar to previous studies done in Thailand [5].

Infection rate was lower 24.2 % in Central health laboratories and higher 37.6% in Abughraib hospital, this finding was reasonable because the samples taken from children who are sick and suffering from diarrhea and the significantly higher prevalence among children below 10 years appears to be associated with their behavior, Children usually practice less strict hygiene and engage in more play activities with soil, They are also prone to contaminated food and drink [6].

There is no significant difference noticed between two sexes (male, female) the infected rate in male was 31.42% while in female 32.14% and this do not agreed with Mercao & Arias [7] opinion when they said that infection percentage of

male was greater than in female because of their activates and agreed with Al-Jeboori.

This study showed that a relation between infection rate and the age, the age of (6-10) years old showed highest infection rate were 66.66% and this closed to AL-Eissa [8] which attributed to their activates.

While the lowest rate of infection 4.08% at age of (1-3) months old because at this age they are kept under their mother care and attention [9].

The study showed a clear effect of Giardiasis on rate of packed cell volume it was in infected children 39.14 % while in non infected 31.91%.

There is also effect of Giardiasis on rate of children hemoglobin it was in infected 11.87gm /100 microlitter while in non infected was 10.05gm/100 microlitter and this agreed with Dutta [10].

This study showed effect of Giardiasis on Total white blood cells it were in infected children 700 Cells/microlitters while in non infected were 785 cells/microlitter and this not agreed with Gurrant [11], which referred to increase of white blood cells to (2000) cells/microliters, because the children at the acute phase of disease.

### **Conclusion:**

*Giardia lamblia* infection is common disease among children in different age group it cause gastrointestinal tract symptoms like abdominal pain and diarrhea sometimes they are only carriers without symptoms.

The most common age group to be affected is 6-10 year, the infected cause changes in PCV and Hb but no change in WBC count

### **Recommendation:**

- 1- Perform a survey study on school children to detect the incidence of Giardiasis at age 6-12 year.
- 2- Study asymptomatic children and food handler to detect the carriers.
- 3- Teach children sanitation of food and water to avoid infection with Giardia.

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