

## **Prevalence of Giardia Lamblia in Stool Samples of Diarrhea Patients in Khost, Afghanistan**

**Assistant Professor Dr. Tahir Shah Nekmal**  
**Senior Teaching Assistant Dr. Mohammad Kamil Sabirzai**

Lecturers of Microbiology & Surgery Departments, Medical Faculty, Sheikh Zayed University, Khost, Afghanistan.

### **Abstract**

The present study was conducted in Khost post graduate civil hospital to determine the prevalence of Giardia Lamblia in stool samples of patients with complain of diarrhea or abdominal discomfort which were came from center and others different districts of Khost province. Three hundred sixty-eight (368) fecal samples were collected randomly from the male, female and children patients who visited OPD (outpatient department) of mention hospitals from March 2020 to August 2020. The samples were screened for the presence of parasites using microscopic techniques (formalin ethyl acetate sedimentation technique). Out of 368 sample analyzed protozoa etiological agent Giardia lamblia was detected in 34 (9.2%) which were representative of total population. Regarding sex in male 25(70%) and 9(30%) were female positive were detected. To control Giardia lamblia is by good hygiene, adequate cooking of food, and protection of food from flies, properly wash raw vegetables before serving, use of boiled water and well developed sewage system. The study concluded that the use of raw animal manure for fertilizer, irrigation of vegetables with fecal contaminated water, poor sanitary system and improper treatment of water supplies can increase the threat of contamination of water which is main source of causing giardiasis and other infections.

**Keywords:** G. Lamblia, Khost residence, Giardiasis, personal Hygiene

### **Introduction**

Giardiasis is a very common gastro-intestinal infection of humans; the World Health Organization has estimated that about 200 million people in Asia, Africa, and Latin America have symptomatic infections (WHO, 1996; Yason and Rivera, 2007). The parasite has a global distribution, but the prevalence of infection is higher in developing regions of the world, where Giardia is common in both children and adults (Cacciò and Sprong, 2014). In recognition of the burden of disease caused by the parasite, and to underline its link to poverty, the WHO has included giardiasis in the list of neglected diseases since 2004 (Savioli et al., 2006). Infection rates have been reported in both developing countries (range 8-30%) and industrialized countries (range 1-8%) (Cacciò, 2015). Rates are probably higher in individuals with diarrhea, but our current understanding is limited by the lack of reporting systems and monitoring programs in many countries, and by the high rate of asymptomatic carriage of Giardia in humans (Cacciò and Sprong, 2011). This suggests that giardiasis is strongly underdiagnosed and underreported.

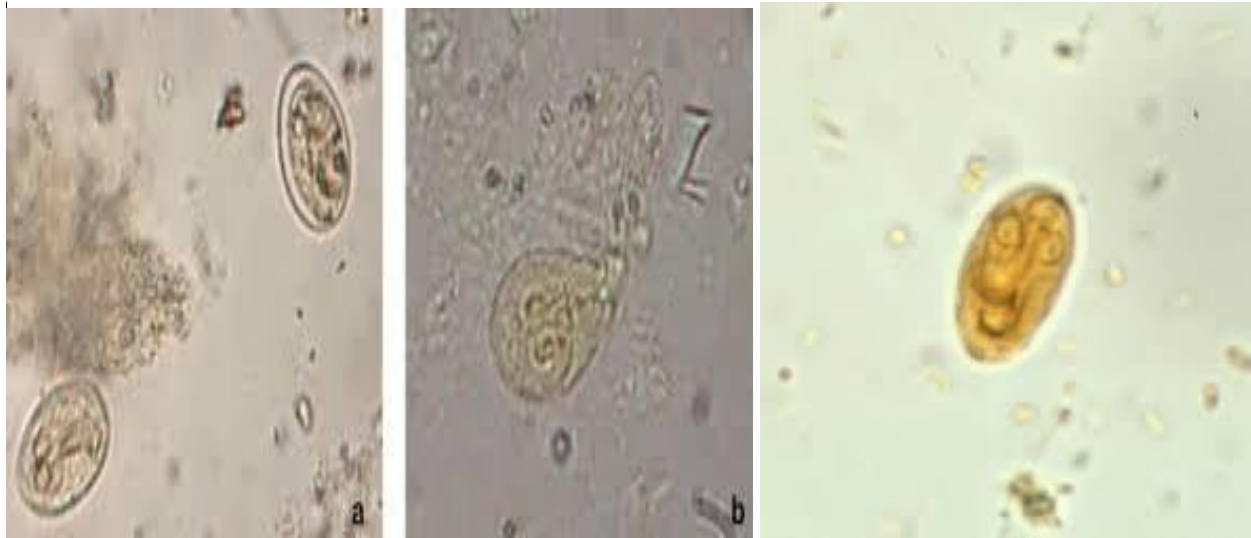
## Material Method

### Sample collection

This study was conducted from March 2020 to August 2020 on those patients which were suffering from abdominal discomfort or diarrhea. A 368 fresh stool samples were collected from different age and gender into a disposable plastic container from different departments of OPD patients in Khost post graduate provincial hospital. Stool samples were immediately transport to the parasitology lab of post graduate hospital of Khost. for analysis of stool samples Formalin- Ethyl Acetate Sedimentation Concentration sedimentation technique was performed to separate the parasite from debris and this method also increase the chance of detection of parasite when these are in low numbers. (Weber et al, 1992; Garcia L. 2007).

### Microscopic Identification of Parasite

For Microscopy of the samples processed immediately without preservation. Two types of direct wet film preparation were done for each sample, 1 slide using normal saline (0.85%) for detecting the actively motile trophozoite and Lugol's iodine (5%) for demonstrating structures. All samples were examined microscopically by using 10 × and 40 × lenses) for the presence of cysts and trophozoites of *G. lamblia*. The microscopic examination was done 3 times on each sample for confirmation. The criteria for positive *Giardia* were active motile flagellated trophozoites and thick hyaline wall of cyst stages.



Cyst and Trophozoite forms of *Giardia lamblia*

Cyst form of *Giradia lamblia*

## Result

Three hundred and sixty-eight (368) OPD patients from center and different districts of Khost province presenting diarrhea or abdominal discomfort were examined for *G. lamblia* infection. Out of 368 stool samples observed microscopically 34 (9.2%) were found positive presence of *G. lamblia*. Out of these numbers, protozoa etiologic agent giardia causing diarrhea was identified in 34 (9.2%) and the prevalence of giardia in male 70 % is higher compared to female 30% (Table 1).

Table 1. Shows overall, male and female prevalence of Giardia lamblia.

| Samples | Overall Positive (%) | Male positive (%) | Female Positive (%) |
|---------|----------------------|-------------------|---------------------|
| 368     | 40 (9.2%)            | 25 (70%)          | 9 (30%)             |

Seasonal or month wise variation of Giardia lamblia from March to Aug.

| Months and Numbers of infected Patient | Total samples | Positive sample  |
|--|---------------|------------------|
| March                                  | 50            | 2( 5 %)          |
| April                                  | 60            | 2(.5%)           |
| May                                    | 55            | 4(1.8%)          |
| June                                   | 60            | 7(1.9%)          |
| July                                   | 65            | 9 (2.4%)         |
| August                                 | 78            | 10( 2.7%)        |
| <b>Total</b>                           | <b>368</b>    | <b>34 (9.2%)</b> |

### Discussion

Intestinal parasitic infections affect people all over the world, high prevalence rate found in those that are living in crowded area with low socioeconomic status, poor environmental hygiene condition, and inappropriate waste disposable, unsafe water supply unclean personal lifestyles (Adamu et al., 2006; Noor Azian et al., 2007). In developing countries these are the major reason of illness and deaths (Adamu et al., 2006). Water born flagellated parasite Giardia lamblia continue to be most frequent protozoan agent of intestinal disease world-wide, People who generally reside in rural or under developed areas are more susceptible to the ingestion of infective parasites as compared to those who live in urban/suburban or well developed areas where sanitation is presumably better; hence possess a lower chance of infection (Wongjindanon et al., 2005).

In present study, a total of 368 stool samples were collected from gastroenteritis patients, out of these samples 34 (9.2%) were identified positive microscopically. Tariq Mohd Tariq (2013) reported 9% stool samples were positive in children for G. lamblia infection in the Laboratory of French Medical Institute of children Kabul hospital this reported finding is same comparable to our findings. One another study was done by Korzeniewski Krzysztof et al, 2014) in Ghazni

Provincial hospital of Afghanistan and reported 38.3% prevalence in stool samples in children & 55.6% in adult is high prevalence rate compare to our finding may be due to crowded area with low socioeconomic status, poor environmental hygiene condition, and inappropriate waste disposable, unsafe water supply unclean personal lifestyles of Ghazni province civilian. Shakkoury and Wandy (2005) reported 29.6% prevalence rate of Giardiasis among population in Amman and Younas et al., 2008 in Peshawar 30.96% these reported finding to some extent is high to our findings may be due to overcrowded environment with low socioeconomic status of mention population. Prevalence of Giardia lamblia was reported in different areas of Pakistan in Punjab 24.2% (Chaudhry et al., 2004), in another study which was done by Shaikh et al., and 2009 in Sukkur, Pakistan reported the prevalence of giardia 36.19% which is higher than our findings. Saeed and Issa et al 2010 reported 50.0% Giardia lamblia infection in Iraq, in Minawali Pakistan, giardia intestinal was recorded 37.7% (Khan Abrar Ul Haq et al June 2015), similar results were reported in Nawabshah Sindh (Akhund 1994), Argentina (Kang et al., 1998) and in rural Southern India (Gamboa et al., 1998), which are high as compared to our findings.

Rajeswori et al 1994 studied G. intestinal and reported G.lamblia (14.7%) in southern India which is little high compare to our finding. Omar Amer et al 2017 studied and reported 3.1% Giardia infection rate in 2011 and 2.19% in 2012 in Riyadh Region, Saudi Arabia, and in Muzafabad Pakistan city 11.8% (Chaudhry et al., 2004) and Yakoob et al., 2010 study conducted at the Aga Khan University showed that overall infection of giardia were 8.7% by microscopic method and PCR respectively, these reported results are lower than our findings, this difference could be due to variation in climate and living conditions.

In our study the prevalence of Giardia lamblia was higher in males than females' other study was done by Korzeniewski Krzysztof et al, 2014) also reported the higher incidence of these parasites in males. Possible reason may be that the males have more outside activities like offices shopkeeper and hoteling as matched to females with the result they are more exposed to unhygienic environmental conditions as studied by (Sayyari et al., 2005).

There are many other factors affecting the prevalence of G. lamblia consisting of sanitary condition and environmental conditions such as location of sampling, animal diversity in the areas, climatic condition, season, volume of sample, rainy seasons and population of the animals in the areas etc. That's how the propagation of G.lamblia is high in developing countries than that of developed countries (Agha rodina & Teoderesco 2002). The study area keeps these conditions which are encouraging the transmission of giardia intestinal.

## **Conclusion**

These results demonstrate that Giardia lamblia is the most prevalent intestinal parasitic problem and environmentally resistant cysts could be widespread and thus an effective hygienic management system is needed to prevent them from serving as the source of infection for human beings.

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