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## Prevalence of *Entamoeba histolytica* in district Buner Khyber Pakhtunkhwa, Pakistan

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**Abstract**

*Entamoeba histolytica* is widely prevalent in all over the world due to poor hygienic condition, and eating habits. The aim of our study was to estimate the prevalence ratio of *E. histolytica* among the patients in the District Headquarter Hospital Dagger Buner, Khyber Pakhtunkhwa, Pakistan. A total of three hundred and sixteen faecal samples were analyzed for the presence of *Entamoeba histolytica* eggs by direct microscopy. Out of 316 patients, 73 were infected with *Entamoeba histolytica*. The overall prevalence of *E. histolytica* was 23.1%. Females were more susceptible (23.6%) than males (22.7%). Age wise data was highest in the age group between 6 to 10 years (33.8%) and lowest in 30 and above years (15.3%). In month wise, the higher prevalence was observed in July (27.6%) and lower was seen in February (16.9%).

**Keywords:** *Entamoeba histolytica*, Prevalence, faecal samples, Buner, Susceptible

**Introduction**

*Entamoeba histolytica* is the protozoan parasite of human intestine which is responsible for the disease called Amoebiasis. After malaria and Schistosomiasis, it is the third most important parasitic disease of humans which cause death. An annually, approximately 40,000 to 100,000 deaths occurred worldwide [1]. It is distributed globally and also a serious problem in tropical and subtropical countries [2]. The infection level of this parasite shows that this parasitic infection is common in both sexes and in all age groups. However, the occurrence of *Entamoeba histolytica* is high in some places and in some ages. The infection rate in human had distributed worldwide, with the superlative frequency and intensity occurring in developing countries [3]. The major clinical symptom of this intestinal parasitic infection is diarrhea [4]. The major cause of transmission of this parasite occurred due to use of uncooked raw vegetable, drinking of contaminated water, unhygienic condition and poor sanitation. According to UNICEF, more than 3 billion people, which decode to half of the universal inhabitants, do not have contact with accurate sanitation [5]. Mostly the diagnosis of *E. histolytica* is still based on the microscopically finding of organisms in faecal samples [6]. Several microscopic diagnoses on the prevalence of *E. histolytica* are performed globally. Significant work has been done in different parts of the world [7] and in Pakistan [8].

**Materials and Methods**

The present study was conducted from February to July 2013. Human faecal sample (n=316) were collected from the different age group of both male and female from District Headquarter Hospital Dagger Buner, Khyber Pakhtunkhwa Pakistan. Fecal samples were examined by temporary mounts to diagnose the *Entamoeba histolytica* [9].

**Preparation of Temporary Mounts of Fecal Samples**

The faecal samples were picked up with a dropper and mixed with normal saline and placed on a glass slide. The slides were covered with a coverslip and examined under the microscope for the detection of *E. histolytica*. There are two methods of preparing temporary mounts of fresh stool: if the stool samples were loose, first a drop of stool was placed on the glass slide and then covered it with a coverslip and observed under a microscope. If the stool sample were solid or semi-solid, then 1mg of stool sample was placed on the glass slide and mixed it with a drop of normal saline. Covered the glass slide with a coverslip and placed under the microscope to examine the parasite.

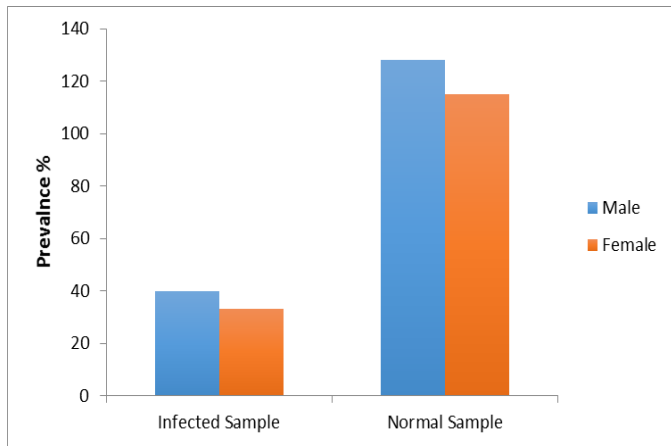
**Results**

**Incidence of *Entamoeba histolytica***

Total of 316 people was examined during the period of February to July. Out of the total, 73 (23.1%) were infected with *E. histolytica*. The percentage of the infected sample were slightly at higher risk in male (23.8%; 40/168) than the females (22.2%) (Table 1 & Figure 1).

**Table 1:** Gender-wise Prevalence of *Entamoeba histolytica*

Variable	No. of Infected Samples	Prevalence%
Male	40	23.8
Female	33	22.2
Total	73	46

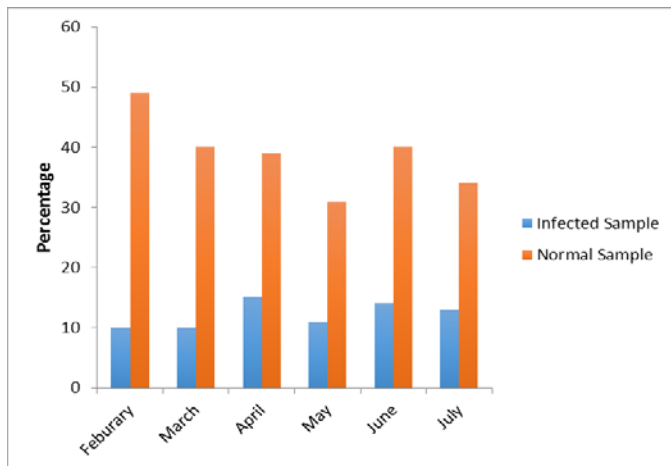


**Fig 1:** Gender-wise Prevalence of *Entamoeba histolytica*  
Month-wise Prevalence of *Entamoeba histolytica*

We also checked the prevalence of *E. Histolytica*, the highest prevalence was seen the month of July (27.6%) whilst the lowest prevalence was observed during the month of February (16.9%). (26.1%), June (25.9%), April (23.4%) and March (20.0%) respectively (Table 2 & Figure 2).

**Table 2:** Month-wise Prevalence of *E. histolytica*

Parameter	No. of Infected Samples	Prevalence%
February	10	16.9
March	10	20.0
April	15	23.4
May	11	26.1
June	14	25.9
July	13	27.6

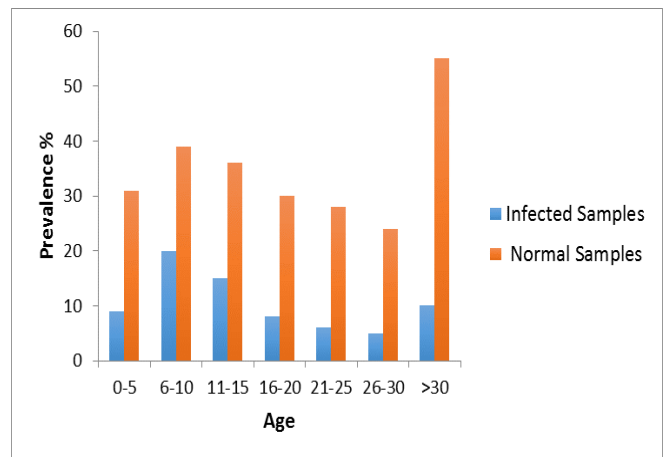


**Fig 2:** Month-Wise Prevalence of *Entamoeba histolytica*  
Age Wise Prevalence

The prevalence *E. histolytica* was higher (33.8%) in the age group 6 to 10 and lower in the age group 30 and above (15.3%). In age group 11 to 15 years (29.4%; 15/51), 0 to 5 years' age group (22.5%), and 16 to 20 years' age group (21.1%) and in the age group of 21 to 25years and 26 to 30 years were similar (17.6%) (Table. 3& Figure 3).

**Table 3:** Age Wise Prevalence of *Entamoeba histolytica*

Variable	No. of Infected Samples	Prevalence%
0 – 5	09	22.5
6 – 10	20	33.8
11 – 15	15	29.4
16 – 20	08	21.1
21 – 25	06	17.6
26 – 30	05	17.2
> 31	10	15.3



**Fig 3:** Age-Wise Prevalence of *Entamoeba histolytica*

**Discussion**

Prevalence of intestinal parasites in a population is generally related to the level of poverty, type of living conditions, personal and environmental hygiene, adequacy of health services, sanitation and availability of clean water supply. The current survey was carried out in the different geographical region of District Buner Khyber PakhtoonKhwa, Pakistan based on the prevalence of *Entamoeba histolytica* species among diarrheal patients. There was no published data found related to the prevalence of *E. histolytica* species from District Buner. According to the above result, the overall prevalence of *E. histolytica* was 22%. 11% prevalence of *E. histolytica* in school going children of Delhi, India [10]. *E. histolytica* has recorded 11.2% prevalence in 383 randomly selected adults in the endemic area of Amoebiasis in Vietnam [11]. The stool samples from different regions were observed from Belem, Para State, Brazil and the overall prevalence of *E. histolytica* was noted 29.35% [7]. In Pakistan, various published data show that *E. histolytica* was frequently present in different regions. *E. histolytica* was found 8% prevalence during the investigation of the intestinal parasite in Northern area of Pakistan [12]. A research survey was conducted on different human intestinal parasite in a different area of Karachi; the overall prevalence of *E. histolytica* was 48.86% [8]. 5.95% prevalence of *E. histolytica* were reported during studies on endo-parasite in children under 15 years old in Muzaffarabad [13]. Amoebiasis depends on many risk factors such as overcrowding, poverty, contaminated water and food, using of raw vegetable, poor sanitation, etc. [14]. The relationship between sex and *Entamoeba histolytica* in humans was calculated. The

prevalence was slightly higher in male (23.8%) than female (22.2%). It has been reported that the overall prevalence 22.7% in male and 19.7% in females during a survey in different rural areas of Nigeria <sup>[15]</sup>. A research report was presented in Sudan; during the investigation, they noted that males (31.9%) have high prevalence than females (27.5%) <sup>[16]</sup>. Another survey on the prevalence of *Entamoeba histolytica* in the Philippines, reported that there was no such difference in sex distribution <sup>[17]</sup>. The Same result was also published by other research group <sup>[18]</sup>. Males are more susceptible to parasitic infection than females because the male has lower immune response and high rate of infection <sup>[19]</sup>. Other reasons are male have more outdoor works in villages and expose to the more unhygienic environment <sup>[20]</sup>. The relationship between sex and *Entamoeba histolytica* in humans was also calculated. According to the present result, the highest prevalence was observed in age group of 6-10 year (33.8%) and 11-15 year (29.4%) while lower infection rate was noted in another age group of 0-5 year (22.5%), 16-20 year (21.1%), 21-25 year (17.6%), 26-30 year (17.2%) and >31 year (15.3%). The highest prevalence (41%) in the age group of 6-14 years during a survey on *E. histolytica* in Karnataka <sup>[21]</sup>. A similar result was also found in children < 15 years with prevalence (27%) in Northern areas of Pakistan <sup>[22]</sup>. A survey conducted in Malaysia on the prevalence of *E. histolytica*, the highest infection rate (52%) was found in the age group 0-19 year <sup>[23]</sup>. The results indicate that parasite is more prevalent in young age group because children have lower resistance as compared to adults. Parasitic infection is mostly found in younger people who expose to the overcrowded environment such as school, playground, etc. <sup>[24]</sup>. Children are more susceptible to infection and have an immature immune system. Mostly, children do not wash their hand before a meal and lack of personal and faecal hygiene condition <sup>[25]</sup>. Seasonal variation was also studied between month and *E. histolytica*. During the present study, the highest prevalence was observed in the month of July (27.6%) and lowest in the month of February (16.9%). The infection rate was increased month wise from May to July, this may be due to the hot season followed by diarrheal diseases due to drinking of contaminated water <sup>[26]</sup>.

## Conclusion

*Entamoeba histolytica* can be a re-emerging serious infection when it finds favorable environmental and host factors conditions. It may be the time now for the need to *E. histolytica* vaccine to guard against this severe *Entamoeba histolytica* infection. It is recommended that there is an urgent need of identification and confirmation of the factors responsible for the spread of the disease in our community through a prospective study designed and development of a comprehensive health education program and treatment of the infected persons to eliminate this menace from the community.

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