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## Prevalence of Intestinal Parasites among HIV/AIDS Patients in South Western, Libya

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### Abstract:

This study was conducted at the Central Laboratory of Sebha, Libya with collaboration with Tropical Diseases Hospital and Center for Communicable Diseases of Sebha, which hostels for HIV/AIDS patients in Southern Libya during the period of February 2012 to April 2013. To determine the prevalence of intestinal parasitic infections among HIV/AIDS patients in Sebha, Libya. All the stool samples were examined for parasites in fresh mounts, formal-ether concentration technique and modified acid fast stain (Ziehl-Neelsen) technique was used and Chi-square test was used to evaluate apparent differences for significance.

In this study, sixty HIV/AIDS serologically positive patients were included to detect intestinal parasites. Forty HIV/AIDS negative (clinically healthy individuals) were used as controls. Direct smear microscopy and formalin-ether technique were used for the detection of parasites. Intestinal parasites were detected in 25 HIV/AIDS patients (41.66 %) and in 7 (17.5 %) HIV-negative subjects a difference that was statistically significant ( $p < 0.05$ ). There was no significant difference ( $p > 0.05$ ) between males and females patients and two methods used for the detection of parasites. *Blastocystis hominis* and *Cryptosporidium parvum* were commonest (18.33 %) and (15 %) respectively. The other parasites detected were *Entamoeba histolytica* / *E. dispar* (8.33 %), *Giardia lamblia* (6.66 %) and *Entamoeba coli* (5.0 %) in the stools of HIV/AIDS patients. Only one stool sample showed the egg of *Ascaris lumbricoides*. *B. hominis* and *C. parvum* were also commonest (7.5 %) and (5.0 %) among healthy individuals respectively. Diarrhea (36.66 %) was the most common complain among HIV/AIDS patients and protozoans accounted for the majority of diarrhea cases were *B. hominis* and *C. parvum*.

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There was statistically significant difference ( $p < 0.05$ ) in the prevalence of intestinal parasites among HIV/AIDS patients, who were on regular (75 %) and non-regular (26.32 %) taking Highly Active Anti-Retroviral Therapy (HAART) Routine examinations of stool samples for parasites would significantly benefit the HIV/AIDS patients for the treatment of intestinal parasitosis for their overall well being.

**Key Words:** HIV patients, intestinal parasites in HIV patients, Protozoa in HIV patients, Anti-retroviral therapy, Libya.

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### **Introduction:**

Generally young children and adolescents in developing countries display the highest prevalence of intestinal parasites and burden of morbidity [1]. Gastrointestinal involvement in HIV/AIDS patients is almost universal, and significant diseases occur in 50 to 96 % [2]. Diarrhea can be a prevailing manifestation or a life threatening complication of infection with HIV sometimes during the course of disease. A large range of protozoan, helminthic, viral and fungal organisms might cause gastrointestinal tract infections in HIV/AIDS patients. HIV/AIDS infections were fast becoming a major threat in Libya [3]. On the other hand, prevalence of enteric parasitic infections in such patients of the country was still not assessed. Hence, the objectives of this study were to determine the prevalence of enteric parasitosis in Libyan HIV/AIDS patients and to investigate the association of parasites with diarrhea knowledge of intestinal parasites among this population would be useful for reducing morbidity and improving the efficiency of antiretroviral treatment.

### **Materials and Methods:**

The study was conducted at the Central Laboratory of Sebha, Libya with collaboration with Tropical Diseases Hospital and Center for Communicable Diseases of Sebha, which hostels for HIV/AIDS patients in Southern Libya. During the period of

February 2012 to April 2013, one hundred stool samples were collected from 60 confirmed cases of HIV/AIDS with or without GIT symptoms and 40 HIV –negative subjects (clinically healthy individuals). A verbal consent, about clinical history and socio demographic information were obtained from each individual. Two stool specimens from each subject were collected from both patients and healthy controls. All the stool samples for parasitological investigation were processed immediately after collection in Central Laboratory of Sebha. All the stool samples were examined for parasites in fresh mounts, formal-ether concentration technique and modified acid fast stain (Ziehl-Neelsen technique was used for the detection of Cryptosporidial oocysts following the procedure of Cheesbrough [4].

Serological testing for HIV/AIDS patients was done using Wellcozyme ELISA (Murlex, UK) of the Tropical Diseases Hospital and Center for Communicable Diseases of Sebha. The study was approved by institutional ethics committee of Tropical Diseases Hospital and Center for Communicable Diseases. Chi-square test was used to evaluate apparent differences for significance.

### **Results:**

The results of present study are compared with some African Countries and presented in the Table 1.

**Table 1: Prevalence of intestinal parasites and HIV/AIDS patients in African Countries.**

Reference	Country	Prevalence (%) of Enteric Parasites
Hunter et al. [12]	Zambia	56.0
Tarimo et al. [7]	Tanzania	35.0
Cumbo et al. [13]	Zimbabwe	51.0
Makni et al. [8]	Tunis	48.38
Minta et al. [21]	Mali	31.25
Wumba et al. [22]	Congo	26.9
Boaitey et al. [6]	Nigeria	22.7
Alemu et al. [38]	Ghana	35.0
Abaver et al. [17]	Ethiopia	69.0
Keyyegen et al. [14]	Kenya	50.9
Nkenfou et al. [15]	Cameroon	59.5
Present study (2013)	Southwest , Libya	41.66

From the study, the overall prevalence of enteric parasitosis in HIV/AIDS patients was found to be 41.66 % (25 / 60) and 17.5 % (7 / 40) in HIV–negative healthy controls. There was statistically significant difference between them ( $p = 0.011$ ). *Blastocystis hominis* and *Cryptosporidium parvum* were the commonest (18.33%) and (15 %) respectively among HIV/AIDS patients. The other parasites detected were *Entamoeba histolytica /E.dispar* (8.33 %), *Giardia lamblia* (6.66 %), *Entamoeba coli* (50 %) and *Ascaris lumbricoides* (1.66 %).

*B.hominis* and *C.parvum* were also commonest (5 %) and (7.5 %) respectively among healthy individuals. Double (6.66%) and Triple (3.33%) infections were recorded among HIV/AIDS patients, where as in control subjects single infection (12.5 %) of parasite was prevalent. Diarrhea (36.55 %) was higher in HIV/AIDS patients. *B. hominis* and *C.parvum* infections were found exclusively more among patients with diarrhea. There was a statistically significant difference ( $p = 0.005$ ) in the prevalence of intestinal parasites among HIV/AIDS patients, who are taking regular (26.32 %) and non-regular (75 %) highly active antiretroviral therapy (HAART) therapy in this center.

#### Discussion:

Gastrointestinal tract is a largest lymphoid organ in the body for human immunodeficiency virus (HIV), the etiologic agent of acquired immunodeficiency syndrome (AIDS) and it is an important site for HIV induced immunodeficiency. The resulting predisposing the gastrointestinal tract to a spectrum of various pathogens including parasites [5].

The prevalence of intestinal parasites among HIV/AIDS patients in Libya has not been documented so far. Data before this time are not available for comparison. The results of this study showed a high prevalence of intestinal parasites (41.66 %) among HIV/AIDS patients. Almost similar prevalence rates of intestinal parasites have been reported in other parts of African Nations as it was 35 % in Ghana [6] and 35% in Tanzania [7] and 48.38 % in Tunis [8]. Moreover, almost similar prevalence of enteric parasites also has been reported in Brazil [9], Turkey [10] and Malaysia [11]. However, results differ from some African Countries, where a higher rate of intestinal parasites was found as it was 56% in Zambia [12] 51 % in Zimbabwe [13] and 50.9% in Kenya [14], 59.5 % in Cameroon [15], 56.7 % in South Africa [16] and 59 % in Ethiopia

[17]. Higher prevalence of intestinal parasites also reported as it was 50 % in Sultanate of Oman [18] 69.7 % in Saudi Arabia [19] and 52.2 % in Australia [20]. Significantly lower prevalence of intestinal parasites has been reported in some part of the world as it was 31.25 % in Mali [21], 22.7 % Nigeria [22, 6], 26.9 % in Congo [22] and 17.4 % in Iran [23].

In the present study, *B. hominis* was found to be most common (18.33 %) among HIV/AIDS patients. This finding is similar to the results reported in Canada [24], Cuba [25] and Iran [26], which reported highest incidence of *B. hominis* among these patients. Rolston and Rodriguez [27] also found that this organism was prevalent and considered as potential pathogen in HIV/AIDS patients. Recently case reports documenting that *B. hominis* to be an opportunistic pathogen in immunocompromised patients including those with HIV/AIDS individuals [24, 25, 28, 29]. Moreover, *B. hominis* has been reported commonest protozoa among immunocompetent Libyan population [30, 31].

In Libya, limited studies have been carried out for the diagnosis of cryptosporidiosis [32-35] who described the incidence of *Cryptosporidium* spp. varies from 3.19 to 13 % among immunocompetent Libyan children. Among opportunistic protozoan parasites in the present study, *Cryptosporidium parvum* oocysts were detected in nine patients (15 %). Studies in Tunis [8] and Iran [36] have reported almost same prevalence rates of this organism. However, in other studies in Turkey [10], Ethiopia [37] and India [38] *Cryptosporidium* spp. was the most common parasite among HIV-patients.

The other protozoan infections (*Giardia lamblia*, *Entamoeba histolytica* /*E. dispar* and *Entamoeba coli* have not been found to be opportunistic in HIV/AIDS infected patients

[2]. In the present study, *E. histolytica* / *E. dispar* and *G. lamblia* were detected from the stool specimens of HIV/AIDS patients. Similar observations have been found in Cuba [25], India [39], Turkey [40], Ethiopia [2] and Nepal [41], who reported infection of *G. lamblia* and *E. histolytica* / *E. dispar* among HIV patients.

In the present study, diarrhea was most common (36.66 %) symptom among HIV/AIDS patients. Several reports have documented that diarrhea was the most common clinical manifestation in HIV patients. This might be caused by various etiological agents [36]. The results of this study showed that *B. hominis* and *C. parvum* were most common pathogen among HIV / AIDS patients suffering from clinical diarrhea. Various studies have reported a high prevalence of these organisms among HIV/AIDS patients [2, 35, 37, 38, 41].

The results of this study suggest that enteric parasitosis in HIV/AIDS infected patients are different from those in HIV/AIDS –negative persons in Southwest, Libya. This may be due to differences in immunological profiles susceptibility of studied individuals and as well as factors related to sanitation and environmental conditions. Moreover, HIV/AIDS patients, who were taking regular HAART treatment, have significantly improved the outcome of HIV/AIDS subjects in terms of incidence of intestinal parasites, probably due to reconstruction of cellular immunity of these patients. Routine examination of stool samples for parasites would significantly benefit the HIV patients by contributing in reducing morbidity and improving the efficiency of antiretroviral treatment therefore, public health measures and adherence to HAART should be strengthened to improve the quality of life of HIV/AIDS patients in Libya.

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