ORIGINAL ARTICLE

Histopathological Diagnosis of Giardia Lamblia Infection on Upper Gastrointestinal Endoscopy in Adult Population of Karachi City

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ABSTRACT

Objective: To investigate the frequency of giardiasis in upper gastrointestinal endoscopy in adult population of Saddar area of Karachi

Methods: A prospective cross sectional study was done in the Histopathology Department of Dr. Tahir laboratory, Hamdard University Hospital, Karachi during the period of January 2016 to December 2017. Total 187 cases of duodenal biopsies were received at laboratory and were examined for diagnosis of giardiasis. All the data collected was statistically analyzed and the results were tabulated.

Results: From 187 cases, there were 22.4% (42/187) biopsies were giardiasis positive, from which 73% (31/42) of them were males and 26% (11/42) of them were females. There were 57.2% (83/145) males and 42.7% (62/145) females who were giardiasis negative. Mean age of patients with giardiasis was 30±18years while mean age of giardiasis negative patients was 55±17 years. Celiac disease was seen in 5 cases which were associated with giardiasis.

Conclusion: A considerable proportion of adults were infected with Giardia lamblia. In the light of these results, we conclude that significant number of adult population of Karachi residing in Saddar area were affected with this protozoa which is mainly due to poor sanitation, contamination of drinking water and food.

Key words: Giardiasis, duodenal biopsy, endoscopy

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INTRODUCTION:

The extend of different kinds of protozoal infections as well as Giardia lamblia are more common in developing countries as compared to developed one[1]. It is the most important cause of water borne diarrhea causing disease[2]. In 1681, Father of Microbiology, Antoine Yan Leeuwen-hook gave the description of intestinal protozoa Giardia[3].The first outbreak of giardiasis occurred in United Kingdom (Bristol) in 1985[4]. Route of transmission is through fecal-oral route through contaminated food or water or unwashed hands[5].

According to world health organization, giardiasis is more common among school going children, day care centres, travellers, hikers and those who use untreated contaminated water[6]. Lack of proper hygiene, poor sanitation and unavailability of potable water are all the factors contributing in giardiasis[7]. For giardiasis, ten giardia cysts are considered to be adequate to cause infection. After passing through the faeces, the cysts remain infectious for many months even in unfavourable climatic conditions. They have the capability to withstand in inappropriate envoirnmental conditions[5]. Use of untreated contaminated waste water used for irrigation is responsible for increased risk of gardia infection

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in occupationally exposed farmers and textile labourers in Faisalabad[8]. According to one of the study, which was conducted in rural Malaysia, the chances of giardiasis also increased in those people who consumed unwashed fruits, vegetables and uncooked crops[9]. This protozoa affects 280 millions humans per year[10]. Estimated prevalence of intestinal parasitic infection in urban slum of Karachi is approximately 52.8% from which Giardia lamblia was the most prevalent parasite followed by Ascaris lumbricoids[7]. Giardiasis is manifested by wide range of clinical presentation including from asymptomatic carrier to acute or chronic abdominal pain, bouts of diarrhea, malabsorption particularly in children which leads to poor physical and mental growth[11]. In children, chronic infection of giardia can cause malnutrition, iron deficiency anaemia, deficiency of zinc and vitamin A which leads to poor performance at school[12]. According to the recent researches, eight different genotypes have been explained from which A and B infects human[13] and many other domestic and wild animals while other genotypes are host restricted. Dogs are infected by genotype C and D. Cats are infected by genotype F. Hoofed livestocks by E while rats by G. Marine animals are infected by genotype H[13]. There is a contraversial results reported regarding clinical manifestations of genotype A and B. Some studies have found that symptoms are more related to genotype A infections while other studies reported genotype B[13].Traditionally diagnosis of giardiasis has been identified by microscopic examination of stool samples but it can also manifest a false negative result as the infective organism may be excreted at irregular intervals. Hence, upper gastrointestinal endoscopy has been suggested as a valuable tool in the diagnosis of giardiasis[14].

METHODS:

Prospective cross sectional study was conducted from January 2016 to December 2017 at histopathology department of Dr. Tahir lab Hamdard University Hospital Karachi. A total of 187 duodenal biopsies of symptomatic cases (chronically presenting with diarrhea, constipation, abdominal pain, nausea, vomiting, abdominal distension, flatulence and anorexia) suspected for celiac and giardiasis were received. Demographic data including age & gender were recorded.

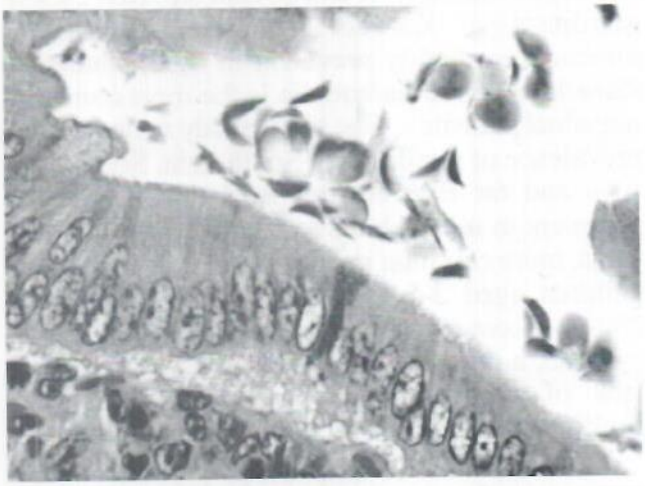
Biopsy samples were processed within two hours. Hematoxylin and eosin stain was used for the diagnosis of giardiasis and celiac disease. Additionally, periodic acid Schiff stain (PAS) was used for the confirmation of the diagnosis.

RESULTS:

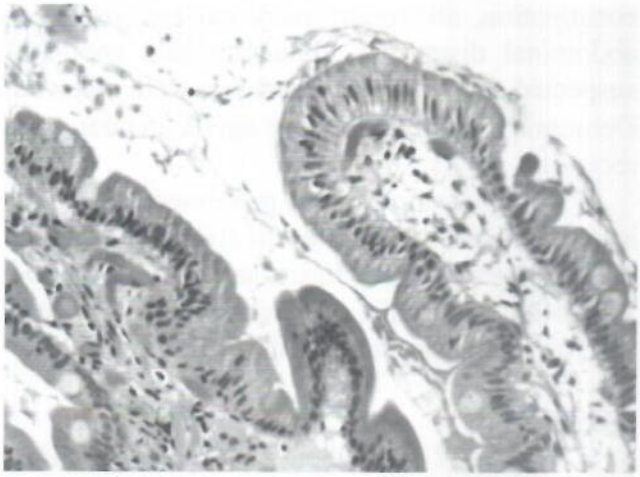
From 187 cases, there were 22.4% (42/187) biopsies were giardiasis positive,73% (31/42) of them were males and 26% (11/42) of them were females. There were 57.2% (83/145) males and 42.7% (62/145) females who were giardiasis negative. Mean age of patients with giardiasis was 30±18years while mean age of giardiasis negative patients was 55±17 years. Celiac disease was seen in 5 cases which were associated with giardiasis.

Table I. Symptoms of Cases with & without Giardiasis.

Symptoms	Girdiasis Postive (n=42)	Girdiasis Negative (n=145)
Abdominal Pain	30	20
Diarrhoea	15	20
Constipation	10	10
Weight loss	05	02



Duodenal biopsy showing trophozoites of giardia lamblia (PAS stain)



Duodenal biopsy revealing trophozoites of giardia lamblia (Hematoxylin & Eosin stain)

DISCUSSION:

Giardiasis is neglected but treatable disease worldwide[15]. Most of the times it is difficult to diagnose giardiasis on routine stool sample examination and it can be missed because of variable cyst excretion and remains neglected[16]. One of the study in Peshawar reported 15.9%, 11.3% and 3.8% rate of isolation of giardia lamblia in first, second and third stool samples respectively[17]. Though, sensitivity of single stool sample is only 30-50%[18] but biopsy remains the second option as it is more specific and it also gives the information of mucosal alteration and villous architecture.

In present study, we found significant frequency of giardiasis which is around 22.4%.Our finding is in accordance with the finding of Mehraj V et al who also reported 28.9% giardiasis in Karachi[7]. Intestinal protozoal infection are highly prevalent in urban slums of Karachi and Giardia lamblia is the most common intestinal parasite[7]. One of the study reviewed the prevalence of giardiasis in South Asia, South East Asia and far East and reported that it is more prevalent in urban slums as compared to the rural areas, more common in poor communities, among children aged 2-5 years and slightly higher in males as compared to females[1]. Poverty, poor hygiene, non- availability of safe drinking water, lack of proper sanitary system and climatic conditions are all the contributory factors[1,17].

Another important factor is asymptomatic carriers in the community which continuously excrete cyst in stools and considered as the mains source of spreading the disease in the community[19]. Climatic conditions also affect the spread of giardiasis where rate of giardiasis increases in summer due to increase water consumption as compare to winter because cold weather kills the cysts[17]. In this study, giardiasis are more common in males and incidence is more in younger age group which is also agreed with the other studies who reported highest rate in this age group[14,19].

Many of the cases in our study had history of abdominal pain and diarrhea. Younus M et al reported a high prevalence of coexistence of recurrent abdominal pain with giardiasis infection. There are no specific symptoms which are associated with giardiasis but abdominal pain with or without diarrhea are most frequent presentation for the diagnosis of giardiasis[17]. Most of the duodenal biopsies showed trophozoites of giardia lamblia on Hematoylin and Eosin stain which was confirmed by PAS. Our findings are consistent with the findings of Yaqoob J et al[14].While investigating giardiasis, association of celiac and giardiasis were found in 5 cases. Similar association was also reported by Edling L et al[20].

Variation in the clinical presentation of giardiasis may mislead and over-look the diagnosis. Duodenal biopsies should be considered with history of prolong and recurrent abdominal pain. Examination of stool sample is not reliable because of intermittent excretion of cyst in stool and it requires repeated stool sample examination.

CONCLUSION:

A significant percentage of adult population of business district of Karachi were infected with giardiasis. In Pakistan, the high prevalence of giardiasis is mainly due to the unavailaibiitly of safe drinking water and unhygienic habits in our society. We should be very careful in consuming water, raw fruits, vegetables and swallowing water from contaminated pools. Availability of safe drinking water and awareness of hygiene may decrease the burden of giardiasis in community.

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