

Prevalence of *Giardia lamblia* in humans visited Central Laboratory of Sebha Province

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Abstract— in the present study showed that out of 501 stool specimens collected from humans visited Sebha laboratory center in Sebha province. The overall prevalence of *Giardia lamblia* infection for both sexes was 3.19% with male infections higher than female were 5.26% and 1.71% respectively. There is no significant differences between infected males and females (95% confidence interval for difference, $t=1.686$ with 6 degree of freedom, $P=0.143$). The age from 11-20 had the highest rate of infection (3.92%). The age groups less than or equal 10 years had the rate of infection 3.64% and older than 60 years were healthy. The age groups 21-30, 31-40, 41-50, the infected percentage were, 3.26%, 2.86%, 2.63%, respectively. There is significant differences between different age groups (95% confidence interval for difference, $t=3.138$ with 6 degree of freedom, $P=0.020$).

The objective of the current study was to determine the prevalence of a protozoan flagellates *Giardia lamblia* parasite in South Libya Sebha Province among humans visited Sebha laboratory centre

Keywords— *Giardia lamblia*, Giardiasis, Ciliates, Protozoa, Prevalence..

I. INTRODUCTION

Giardia lamblia causing Giardiasis which is one of the intestinal protozoa that cause public health problems in most developing countries as well as some developed countries. Infection agent is *Giardia lamblia* a flagellate protozoan. The trophozoite is bilaterally symmetrical, each structure being paired, it possesses two nuclei. The organism is roughly pear shaped when seen in surface view, having broad anterior and very much attenuated posterior end. *Giardia* trophozoites have four pairs of flagella, anterior, lateral, ventral and posterior. Two nuclei lie in the area of the sucking disk in the anterior portion of the body. Two curved rods are seen posterior to the sucking disk. The cyst are ovoid. In permanent stains of cysts one observes four prominent nuclei and four median bodies as well as twice the number of intracytoplasmic flagella structure seen in the trophozoite [1]. Its occurrence a worldwide *Giardia lamblia* is considered to be one of the leading causative agents of diarrhoea in both children and adults [2]. Children are infected more frequently than adults. Prevalence is higher in area of poor sanitation and in institutions with children not toilet trained. The prevalence

of stool positivity in different areas may range between 1% and 30% [3]. The prevalence of *Giardia lamblia* infection was 38.5%. The highest rate of infection was in northern Iraq in orphan care centers (48.1%) and the lowest in the pediatric hospital (31.3%). The age group 10–12 years had the highest rate (81.2%) and 7–9 years the lowest (22.9%); boys had a higher rate than girls. [4]. The prevalence of *Giardia lamblia* at Al-Noor Specialist Hospital. Makkah, Saudi Arabia was (1.3%) [5]. the prevalence in primary schoolchildren in Derna District was *Giardia lamblia* (12.7%) [6]. The cysts and or trophozoite of *Giardia lamblia* in 5-10 age groups with a decrease thereafter [7]. Prevalence of *Giardia lamblia* of Indian employees in Libya about 1.25% [8]. Prevalence of *Giardia lamblia* (2.5%) [9]. Examinations of single stool samples were collected from school aged children (5-14 years old) in the city of Tripoli showed the prevalence of *Giardia lamblia* is 3.2% [10]. The results were based on a single stool per person study of the total children ranging from 5-18 years of age. The rates of flagellates protozoa was *Giardia lamblia* 2%. [11]. The stool samples from males and female children admitted in Ibn-Sina hospital, Sirt, were examined to determine the prevalence of intestinal parasites, *Giardia lamblia* (10.29%) and significantly different existed in the prevalence of intestinal parasites between males and females children ($t = 24.68$; $P < 0.05$). Age groups had no effect on the prevalence of intestinal parasites ($F = 0.66$; $P < 0.05$) [12]. Prevalence of *Giardia lamblia* parasite was found in Zliten 1.2% in children [13].

The objective of the current study was to determine the prevalence of a protozoan flagellates *Giardia lamblia* parasite in South Libya Sebha Province among humans visited Sebha laboratory center.

II. MATERIALS AND METHODS

Number of people visited central hospital Sebha and central laboratory Sebha examined. The stools of 501 from them were examined during April 2009 – July 2009 of both sexes, for the cysts and/or trophozoites of intestinal flagellate protozoan parasite *Giardia lamblia* in them. Out of these, 209 were men and 292 were women, and they belonged to different ages.

III. PARASITOLOGICAL EXAMINATION

Fresh stools (color: brown, blackish brown, black, green or yellow) were collected clean, numbered plastic containers. Personal details including name, age and sex were recorded for

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each sample. The consistency of the sample was checked, and observations were made on the presence of mucus or blood in the stools. They were later homogeneously mixed and directly examined, on the same day of collection, for cysts and/or trophozoites of protozoan parasites using direct smear examination. A small amount of fecal specimen was taken and the stool was thoroughly emulsified in saline and iodine using an applicator stick. A homogeneous thin film was prepared on each slide by mixing the stool with a drop of normal saline or iodine. And a cover glass was placed on each preparation. The preparations were examined systematically using low (x10) and high (x40) power microscope. of both normal saline solution, and Lugol's iodine solution [15]. The cysts and/or trophozoites of protozoans found in the stools were identified using the keys and description given by [16].

IV. ANALYSIS OF THE DATA

Stools without any cysts and/or trophozoites of protozoan flagellates *Giardia lamblia* parasites were categorized as negative, and those that contained the same, as positive. The data were subjected to relevant statistical analysis and the P value less or equal 0.05 considered significant.

V. THE RESULTS

The results in the present study showed total percentage of infected subject examined was 3.19%, from the total female was 1.7% and male was 5.26% as showed in Table I. There is no significant differences between infected males and females (95% confidence interval for difference, $t=1.686$ with 6 degree of freedom, $P=0.143$).

TABLE I
DISTRIBUTION OF *GIARDIA LAMBLIA* INFECTION AMONG HUMANS IN SEBHA PROVINCE ACCORDING TO SEX

| Sex | No of tested | Positive s | Percentage |
|-------|--------------|------------|------------|
| ♀ | 292 | 5 | 1.71% |
| ♂ | 209 | 11 | 5.26% |
| Total | 501 | 16 | 3.19% |

In the Table (II), the data showed that the age less than or equal 10 years the percentage of infection recorded 3.64 %, which was somewhat less than the next group of ages (11-20) which recorded 3.92%. The other group of ages from 21-30, 31-40, 41-50, 51-60, 61 or over, appear descending percentage of infection which were 3.26%, 2.86%, 2.63%, 2.38%, 0.00%, respectively. There is significant differences between different age groups (95% confidence interval for difference, $t=3.138$ with 6 degree of freedom, $P=0.020$).

TABLE II
DISTRIBUTION OF *GIARDIA LAMBLIA* INFECTION AMONG HUMANS IN SEBHA PROVINCE ACCORDING TO AGE AND SEX

| Age group | No of tested | | | positives | | | Percentage |
|-----------|--------------|------|--------|-----------|------|--------|------------|
| | Total | Male | Female | Total | Male | Female | |
| (≥10) | 165 | 71 | 94 | 6 | 4 | 2 | 3.64% |
| (20-11) | 51 | 27 | 24 | 2 | 1 | 1 | 3.92 % |
| (30-21) | 153 | 49 | 104 | 5 | 4 | 1 | 3.26 % |
| (40-31) | 35 | 20 | 15 | 1 | 1 | 1 | 2.86 % |
| (50-41) | 38 | 15 | 23 | 1 | 1 | 0 | 2.63% |
| (60-51) | 42 | 20 | 22 | 1 | 1 | 0 | 2.38 % |
| (≤61) | 17 | 07 | 10 | 0 | 0 | 0 | 0.00 % |

VI. DISCUSSION

Examination of the stools of male and female Libyan nationals visited central laboratory at Sebha province, revealed the presence of a protozoan ciliated parasite, *Giardia lamblia*. The percentages of males found infected with these parasites were higher when compared with the same of females, even though the difference was found to be insignificant. In this present study is similar to other studies in Libya [12]. The results are also in agreement with studies in other parts of the world [4,7]. The overall percentages of male and female was 3.19% is resemble to the result by [11] and [9] had shown the prevalence between 1-30%. The fluctuations with other studies due to the different in implementing experiments, seasons, socioeconomic status for the subjected persons at the time of study and the weather either warm climates or cool whereby more common in warm climates than in cool ones [14]. The infected rates with *G lamblia* rose progressively with age to reach peak. Regarding the results of *G. lamblia* infection among different age groups, prevalence in males and females of age-group less or equal 10 years of age-group in both sexes had a low rate of infection comparing with age group 11-20 age group, perhaps because parents are responsible for their hygiene, whereas progressively declined in adults, indicated that effective immunity towards this parasitic might have acquired. The infection rate was highest in the age group 11–20 years. This may be because this group of age fully independent in toilet use and are more involved in outdoor activities which might lead to *Giardia* transmission .

In conclusion, a high to moderate prevalence of *Giardia lamblia* in male and female Libyan nationals, are matters of concern, suggesting the urgency and priority for implementing the preventive and precautionary measures to check the spreading of this ciliate protozoan parasite *Giardia lamblia*. These include effective environmental sanitation to prevent water and food contamination, proper sewage, adequate handling and treatment of water supplies and food, and health education especially for young children under 10 years of age.

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