

# Prevalence of Intestinal Parasitic Infections in the City of Zawia, State of Libya

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## Abstract

Intestinal parasitic infections have been described as the greatest single global cause of disease and illness. A survey of prevalence of intestinal parasites among the native Libyan people attending several health centers (governmental and private) in the city of Zawia. The study was designed to cover the period of 2010-2015. Stool tests from 12,850 patients was performed. 8950 specimens of the 12,850 examined were found to be infected with intestinal parasites. The infection rates were 69.6% among the native population. The rate of infection in females (65%) was higher than in males (34.9%). Overall, protozoa infections (92.4%) were higher than helminths infections (7.6%). *Entamoeba histolytica* (60.70%) and *Giardia lamblia* (31.73%) were the most common intestinal parasites identified. Among the helminths, *Ascaris lumbricoides*, *Trichiuris trichiura* and *Hymenolepis nana* were the frequent ones. The high prevalence rate of intestinal parasitic infections among the local Libyan people clearly indicates that there is continuous ongoing transmission of various parasitic infections in the community.

**Keywords:** Intestinal parasites, prevalence, Libya.

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## INTRODUCTION

According to WHO more than two billion people around the world are infected with intestinal parasites [1]. Libya State is facing several problems in the health sector due to the political instability after the February Revolution. The recording and reporting systems in the health units, in the past, were well organized [2]. This reference should be the annual reports of the Ministry of Health. However, the situation now is not known. No recent data are available on the prevalence of infection of the parasitic diseases in the city of Zawia, the third biggest city of the western region of Libya State. The Annual Reports of the Ministry of Health have stopped since 2010.

Many parasitic diseases are believed to be endemic. The exact magnitude of these parasites and the transmission patterns in the area are unknown. Basic information is urgently needed to help in planning and developing a control strategy.

The present work is reporting the result of a retrospective/descriptive cross sectional survey carried out at selected health units in the Zawia city in 2015. The study aimed to: (1) determine the efficiency and reliability of the recording system in the health units, (2) determine the prevalence of the parasitic diseases from the records of the selected health units, (3) establish a baseline data for the prevalence of parasitic diseases in 2015 and (4) to advise the local authorities on the control measures to be adopted. Lack of access to potable water, poverty and a humid and hot climate conditions are some of the common factors contributing to high intestinal parasitic infection.

## MATERIALS AND METHODS

The Zawia region consists of scattered residential sectors, farms and scattered individual houses in the peripheral rural parts. It could be divided into four areas. These are: the Northern, Southern, Western and Eastern areas respectively. In each area, seven health units were randomly selected to examine the records of the out-patients. The out-patient group was selected because of the largeness of the area and

the difficulty to reach all those who would be willing to participate in the study. The records of the registry book of the laboratory results in each health unit, from 2010 to 2015, were examined to determine: (1) the number of those who used the facility provided by the health unit *i.e.* the laboratory, (2) the prevalence of the intestinal parasitic diseases by year, age and gender.

A preparatory meeting was held with the health authorities in The city of Zawia and the directors of the selected health units to obtain their support and help. Instructions were given to the doctors in the health units that all out-patients suffering from gastrointestinal symptoms should be referred to the laboratory to examine the stools, during 2015. A data sheet was designed to record age, gender and the result of the stool investigation. Information about the laboratory techniques used for the examination of the stools, from 2010 to the beginning of the study, were obtained.

A monthly visit was arranged to each of the selected health units. The records of the laboratory results were examined, analyzed and checked.

The methods used for the stool sample examinations were: (1) the direct wet mount of stool in saline, stained with iodine followed by microscopic examination, and (2) the formalin ethyl acetate technique.

The Statistical Package for Social Sciences (SPSS) program (version 19) was used. The

independent samples t-test was used to compare two groups of data. Analysis of one-way variance (ANOVA) was used to compare more than two groups of data. In order to determine where the significant difference exactly came from, the Multiple Post-Hoc test (Tukey) was used,  $P = 0.01$ .

## RESULTS

The data were collected from 28 health units, from the different sectors areas of the city of Zawia. Table 1 shows the geographical distribution of the selected health units, the affiliation of the unit to the private or government sectors and the number of the out-patients examined in each unit, from January 2010 to December 2015. A total of 12,850 patients attended the out-patient. They consisted of 3130 males and 5820 of females with age ranging from 0–60 years.

Out of the 12,850 patients attended the out clinics in the 28 centers, attended the government centers and the rest the private centres.

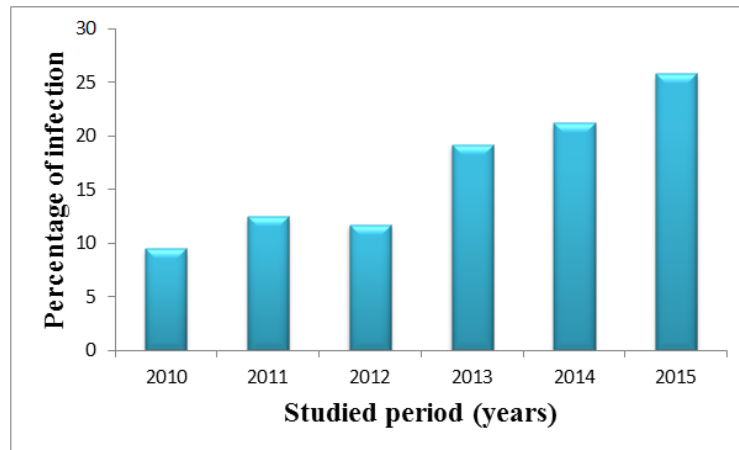
Out of those examined in the 28 centers, 8,950 (69.6%) were found infected with intestinal parasites, Table-2. 60.7% of them were infected with *Entamoeba histolytica*, 31.73% were infected with *Giardia lamblia*, and the remaining 7.6% were infected with *Hymenolepis nana*, *Trichiuris trichiura* and *Ascaris lumbricoides*.

**Table-2: Intestinal parasites infections in the study population**

Parasites	Number and Percentage of infected Out-patients	
	No	% Percentage of infection
<i>Entamoeba histolytica</i>	5,433	60.7
<i>Giardia lamblia</i>	2,840	31.7
<i>Trichiuris trichiura</i>	100	1.2
<i>Hymenolepis nana</i>	530	5.9
<i>Ascaris lumbricoides</i>	47	0.5
Total parasites	8,950	
Study population	12,850	

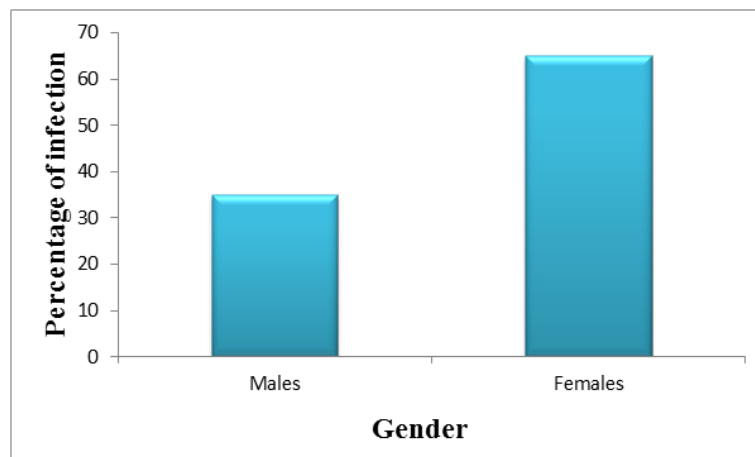
There was a steady increase in the total prevalence of all parasitic infections among the out-patients from 2010 to 2015, with an insignificant

decrease during 2012, Figure-1. The increase in the prevalence of intestinal parasitic diseases between 2010 and 2015 was statistically highly significant ( $P > 0.001$ ).



**Fig-1: Distribution of Intestinal Parasitic infection by year**

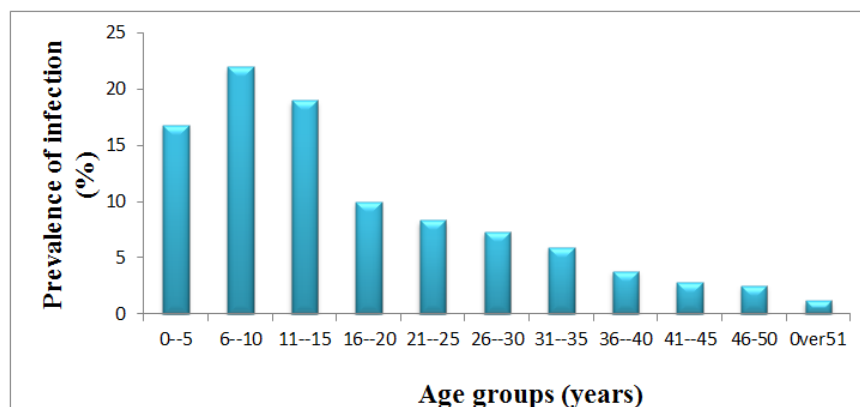
Figure-2 shows the percentage of intestinal parasitic infection by gender. The females had almost double the infection of the males (65% compared to 34.9%, respectively),  $P < 0.01$ .



**Fig-2: The Percentage of Infection of parasitic Diseases in Zawia area, State of Libya, 2010-2015**

Figure-3 shows the percentage of infection of intestinal parasitic diseases by age group. The youngest three age groups, 0-5, 6-10 and 11-15 years olds

constituted the majority (60%) of the out-patient clinics with intestinal parasitic infections.



**Fig-3: Total Prevalence of Parasitic Diseases by Age, Zawia area, State of Libya, 2010-2015**

## DISCUSSION

The western area of Libya is very large and the population is distributed in small farms and living compounds throughout the area, in addition to several towns and large villages on the coast along the International High Way from Algeria to Egypt. The city of Zawia can be divided into four areas. The Northern, the Southern, the Eastern, the Western areas. The whole area is served by University Teaching Hospital, rural hospitals and several health centers. The hospitals and health centers are manned by medical doctors, qualified nurses, diagnostic laboratories, laboratory technicians and administrative supporting staff.

The infection of parasitic diseases until 2010 was very low. The removal of the previous political system and the revolution which followed have very serious consequences on the services provided to the people and specially in the health sector.

Water, in the city of Zawia, is provided from four different sources. These are: (1) old wells in houses; (2) old town water distribution system; (3) new town water distribution system and (4) bottled water. There are no data available on the prevalence of parasitic diseases in the area or whether the prevalence is affected by the type of drinking water. Many parasitic diseases are believed to be endemic. The exact magnitude of these diseases and the transmission patterns in the area have not been studied before. Basic information is urgently needed so as to help in planning a control strategy.

It is noticed that the dominating infections are the protozoan parasites and that the females is the most affected group by them. There are several factors that lead to this. The way of transmission of these parasites and continuous exposure to the source of infection. Most of the ladies buy the vegetables from domestic use from the market. The vegetables are most probably the main source of infection. They are exposed to contamination by flies and the farm workers who are not inspected and are without supervision.

The absence or scarcity of water in some parts of Zawia is another reason for the spread of the infection among the ladies, especially in the sectors where water is scarce. The Situation of the old well is another reason for the spread of the diseases. This is a preliminary survey and it highlights several areas that need research in the future, for example a detailed study

on the mode of transmission in each sector. It is hoped that the outcome of the study will improve knowledge about the epidemiology of parasitic diseases in the city of Zawia and will help the health authority to implement an integrated comprehensive suitable control strategy in collaboration with other government departments, specially the water department.

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