Association between Season and Intestinal Parasitic Infection in Northwestern Iran

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Abstract—Intestinal parasitic infections are common among inhabitants of north and northwestern areas of Iran. The main aim of this study was to determine the seasonal fluctuation of intestinal parasitic infections in Hamedan (northwestern area in Iran). The hospital documentary of 551 patients encountering medical examinations due to intestinal parasitic infections, was studied. Subsequently the data were analyzed statistically using ANOVA. The helmint infection rate was significantly higher than protozoan infection. Ascaris lumbricoides, Giardia lamblia, Entamoeba Coli were the most prevalent intestinal parasites among cases. Lower prevalence rate of Ascaris lumbricoides infection was during spring and peak incidence was during winter and autumn, while lower prevalence rate of Giardia lamblia and Entamoeba Coli infection was during winter and autumn and peak incidence of Giardia lamblia was during spring and of Entamoeba Coli was during spring and summer. There was no significant difference between male and female intestinal parasitic infections. Conclusively we observed a significant difference in frequency of Ascaris, Giardia and Entamoeba Coli infection in different seasons of a year. This seasonal fluctuation of intestinal parasitic infections should be taken into account in the planning of preventive programs.

Keywords—Parasite, Infection, North-western Iran.

I. INTRODUCTION

Ascaris lumbricoides is the giant roundworm of humans, responsible for the disease ascariasis in humans, and it is the largest and most common parasitic worm in humans. One-sixth of the human population is estimated to be infected by Ascaris lumbricoides or another roundworm [1],[2] Ascariasis is prevalent worldwide and more so in tropical and subtropical countries. It can reach a length of up to 35[3]-[5]

Giardia lamblia is a flagellated protozoan parasite that colonizes and reproduces in the small intestine, causing giardiasis. The parasite attaches to the epithelium by a ventral adhesive disc, and reproduces via binary fission,[6] Giardiasis does not spread via the bloodstream, nor does it spread to other parts of the gastrointestinal tract, but remains confined to the lumen of the small intestine.[7] Giardia trophozoites absorb their nutrients from the lumen of the small intestine, and are anaerobes. If the organism is split and stained, its characteristic pattern resembles the familiar "smiley face" symbol. Chief pathways of human infection include ingestion of untreated sewage, a phenomenon particularly common in many developing countries [8] contamination of natural waters also occurs in watersheds where intensive grazing occurs.

Entamoeba coli is a non-pathogenic species of Entamoeba that frequently exists as a commensal parasite in the human gastrointestinal tract. Clinically, E. coli is important in medicine because it can be confused during microscopic examination of stained stool specimens with the pathogenic Entamoeba histolytica. While this differentiation is typically done by visual examination of the parasitic cysts via light microscopy, new methods using molecular biology techniques have been developed [10], [11].

This study was carried out to determine the seasonal fluctuation of intestinal parasite infection in northwestern Iran.

II. MATERIAL AND METHODS

A. Protocol of Study

The hospital or clinical laboratory documentary of 551 patients encountering medical examinations due to intestinal parasitic infections was studied. The data were classified on sex, type of parasite infection and the season in which the patients were referred to hospital or laboratory.

B. Statistical Analysis

All values are presented as mean ± S.E.M. Statistical significance was evaluated by one-way analysis of variance (ANOVA) using SPSS 19. Significance was measured using Fisher’s least significant for the exact P values and significant differences are noted in the results. Differences with P<0.05 were considered significant.

III. RESULTS

Table I and figure 1 represent frequency of Ascaris lumbricoides, Giardia lamblia and Entamoeba Coli infection in patients in different seasons of year in northwestern - Iran.

The highest ascaris infection rate was found in fall (59.3%) and winter (60%) while Giardia infection was higher in spring (35.5%) compared to other seasons. As a final point, it is interesting to note that Entamoeba infection was higher in spring (15%) and summer (14.2%) (figure 1).
TABLE I
RATE OF PARASITE INFECTION IN DIFFERENT SEASONS OF YEAR. A INDICATES ASCARIS INFECTION, G INDICATES GIARDIA INFECTION AND E INDICATES ENTERAMOEBA INFECTION.

<table>
<thead>
<tr>
<th>Season</th>
<th>Total Male</th>
<th>% A</th>
<th>Total Female</th>
<th>% G</th>
<th>% E</th>
<th>% Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>48.8</td>
<td>11.3</td>
<td>51.2</td>
<td>56.2</td>
<td>43.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Winter</td>
<td>60</td>
<td>24.2</td>
<td>55.4</td>
<td>35.3</td>
<td>64.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Spring</td>
<td>45.5</td>
<td>15</td>
<td>52.5</td>
<td>47</td>
<td>52.4</td>
<td>4.7</td>
</tr>
<tr>
<td>Summer</td>
<td>53.7</td>
<td>14.2</td>
<td>57.1</td>
<td>53.4</td>
<td>46.6</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Fig. 1 Seasonal fluctuations of parasites infection.

IV. DISCUSSION
As we have shown there was a considerable prevalence of intestinal parasite infection in north western Iran. Human intestinal parasites are one of the important health problems in the most communities, especially in cool and dry areas [12]-[14]. We have also shown that there is a seasonal fluctuation in intestinal parasite infection in north western Iran. During a time, parasitic infection patterns in the population may alter due to changes in the human behavior and life styles [12]. In our study the Northwestern Iran was selected because it was previously described as an area with a high prevalence of intestinal parasitic infection [15]. The seasonal fluctuation of intestinal parasite infection may come from the reasons including season humidity, season dryness, transmission, diet and body condition [16].

V. CONCLUSION
We have shown that there is significant difference in frequency of Ascaris, Giardia and Entamoeba Coli infection in different seasons of a year. This seasonal fluctuation of intestinal parasitic infections should be taken into account in the planning of preventive programs.

ACKNOWLEDGMENT
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REFERENCES
[7] Harrison's Internal Medicine, Harrison's Online Chapter 199 Protozoal intestinal infections and trochomoniastis