Prevalence of intestinal parasitic infestation in Ma’an governorate, Jordan

Khalil I Altaif

College of Aisha Bint Al-Hussein for Nursing Al-Hussein Bin Talal University, Ma’an, Jordan

1. Introduction

Parasitic infestations are one of many factors that cause gastrointestinal syndromes such as, diarrhea, weight loss, abdominal discomforts and pain in many tropical and subtropical countries of the world[1-2]. Many environmental and socioeconomic factors such as poverty, malnutrition, potable water, low health status, poor sanitary facilities and other factors are the major causes of the increasing incidence of parasitic infections in these areas[2].

Epidemiological surveys carried out in many countries have demonstrated the importance of parasitic infections and some of these studies showed that there is correlation between the incidence of parasitic infections and seasons of the year[2-5].

It appears that summer months are a favorable period for the development and survival of many parasitic species and accordingly the rate of incidence increases during this season[6,7].

All the published reports on the prevalence and the importance of parasitic infections in Jordan indicated that Entamoeba histolytica (E. histolytica) and Giardia lamblia (G. lamblia) are among the most common parasites[8-10]. However, very little information is available concerning the incidence of parasitic infestations in Ma’an governorate. Therefore, the aim of the present study was to determine the incidence among people referred to Ma’an hospital in order to help the health authorities in Ma’an governorate in planning for the prevention and control of such diseases.

2. Materials and methods

The results from the examination of the stool samples of 1999 patients suffering from different abdominal disorders, who had been referred to Ma’an hospital, Ma’an south of Jordan during the period between 1st January to 31st December 2009 were retrospectively reviewed and the incidence and percentages of parasitic infections were determined.

All the specimens were examined by direct fecal smear
Table 3
Monthly distribution of intestinal parasites [n (%)].

| Month | No. of cases | Infection cases | E. histolytica | G. lamblia |
|-------|--------------|----------------|----------------|-----------|
| Jan   | 132          | 20 (15.2)      | 13 (9.8)       | 5 (3.8)   |
| Feb   | 142          | 15 (10.6)      | 13 (9.2)       | 2 (1.4)   |
| March | 136          | 22 (16.2)      | 16 (11.8)      | 4 (2.9)   |
| April | 181          | 27 (14.9)      | 23 (12.7)      | 4 (2.2)   |
| May   | 212          | 29 (13.7)      | 23 (10.8)      | 4 (1.9)   |
| June  | 195          | 38 (19.5)      | 34 (17.4)      | 3 (1.5)   |
| July  | 275          | 61 (22.2)      | 49 (17.8)      | 11 (4.0)  |
| Aug   | 185          | 35 (18.9)      | 30 (16.2)      | 4 (2.2)   |
| Sept  | 141          | 37 (26.2)      | 31 (22.0)      | 5 (3.5)   |
| Oct   | 156          | 31 (19.9)      | 26 (16.7)      | 5 (3.2)   |
| Nov   | 86           | 7 (8.1)        | 5 (5.8)        | 1 (1.2)   |
| Dec   | 158          | 16 (10.1)      | 10 (6.3)       | 5 (3.2)   |
| Total | 1999         | 338 (16.9)     | 273 (13.7)     | 53 (2.7)  |

The result also showed that the total number of subjects admitted to the hospital was increased during summer months. This was accompanied by a much higher prevalence with both *E. histolytica* and *G. lamblia* during the same period which extended from June to October (Tables 3 and Figure 1).

4. Discussion

The overall prevalence and percentage of intestinal parasitic infections in this study 338 (16.9%) is higher than the overall prevalence rate (9.9%) reported by the Ministry of Health in Jordan, Directorate for Disease Prevention and Control in 1996[8] and that of Al–Momani et al in their retrospective study in Jordan (4.4%)[9]. However, the overall prevalence is lower than that reported from Southern Jordan (28.5%)[10]. Several reports from neighboring countries showed that the prevalence rate varies between these countries and our findings[2,5,6]. It seems that these differences can be attributed to a number of factors such as geographic, socioeconomic, climate, poverty, malnutrition, personal hygiene, population density, potable water and sanitation facilities. These factors play a key role in determining the prevalence of any parasite population in any geographical region of the world[2].

Six types of different intestinal parasites were detected...
during this retrospective study. *E. histolytica* is by far the most common species in both male and female patients as well as in adults and children. In general protozoal infections with *E. histolytica* and *G. lamblia* were found to be much higher than helminth infestations. This is in agreement with reports from Palestine[2], Iran[3] and Jordan[15]. However, *G. lamblia* seems to be the commonest species in south Jordan with a prevalence rate of 42.6%[16]. The low prevalence of helminth parasites such as *Ascaris lumbricoides*, hookworms and *S. stercoralis* is probably due to adverse conditions in this area of Jordan where the climate is characterized by a desert environment. Such weather is not suitable for the survival of eggs and larvae of helminth parasites in the environment. However, the unexpected result of a low incidence of *E. vermicularis* in children is probably due to the method employed in the stool examination. A higher percentage (5.9%) from southern Jordan was reported with *E. vermicularis*[16]. This difference is probably due to both sample groups which were selected from a community population (school children) and the technique employed (scotch tape exam).

With regard to the seasonal effect on the prevalence of parasites, a remarkable seasonal fluctuation was observed. The highest numbers and percentage occurred in summer months with a peak incidence in September (26.2%), while the lowest occurrence of parasitic infestations was evident in winter season (November–February). The prevalence showed the lowest percentage during November (8.1%). A similar finding was reported from Palestine that a peak of incidence occurred during summer months[6,7]. The incidence of intestinal parasitism in Ma’an Governorate is therefore considered to be comparatively low as compared with other parts of Jordan and other Arab countries and countries in middle east[2–5].

Though the prevalence of intestinal parasites in Ma’an governorate Southern Jordan is low, it is necessary to develop a comprehensive health education program and sanitation improvements to keep this problem under control and at a low level. To confirm these results a further survey is needed in order to obtain reliable data on the prevalence of intestinal parasites in different health care centers in the governorate.

**Conflict of interest statement**

We declare that we have no conflict of interest.

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