SHORT COMMUNICATIONS

UDC: 614:[616.9-036.22:616.34
https://doi.org/10.2298/VSP161118032R

Intestinal parasitosis in asylum seekers from the Middle East and South Asia

Parazitoze kod azilanata sa Bliskog istoka i iz južne Azije

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Abstract

Background/Aim. It is estimated that about 230 million refugees and asylum seekers circulates worldwide. Parasitosis are diagnosed in recent years with increasing frequency both in Europe and other developed countries. International migration of population, as an inalienable part and a result of the process of globalization, has an increasing impact on health of the population of countries through which migrants pass or settle. The aim of this study was to determine the incidence of intestinal parasitic diseases in asylum seekers on the territory of Belgrade. **Methods.** The study group included 97 asylum seekers from the Centre for Asylum seekers in Obrenovac, in the period December 2013–January 2014. Stool samples were taken less than seven days after arriving to the Center and sent to the Laboratory for Parasitological Diagnosis of the Public Health Institute of Belgrade. Detection of parasites in stool samples was performed by a direct native slide made of fresh sample and direct slide made after stool concentration applying "Mini Parasep" technique. Statistical analysis included application of χ^2-test of matching and χ^2-test of independence. **Results.** The study showed that the parasites were detected in 9.3% of cases, in the group of 15–24 years of age. Protozoa were found in 6.2% and helminthes in 3.1% of the samples. **Conclusion.** Most intestinal parasitosis were found in asylum seekers from Bangladesh. All parasitosis were found in males and the most frequently detected parasite was *Giardia lamblia.*

Key words:
parasitic diseases; refugees; diagnosis; feces; serbia.

Apstrakt

Uvod/Cilj. Procenjeno je da širom sveta cirkuliše oko 230 miliona izbeglih lica i azilanata. Parazitoze se poslednjih godina dijagnostikuju sa sve većom učestalošću kako u Evropi, tako i u drugim razvijenim zemljama sveta. Međunarodna migracija stanovništva kao neotuđivi deo procesa globalizacije i kao njena posledica, sve više ima uticaja na zdravlje stanovništva zemalja kroz koje migranti prolaze i u kojima se nastanjuju. Cilj ovog rada je bio da se utvrdi učestalost parazitoza kod tražioca azila na teritoriji Beograda. **Metode.** Ispitivanjem je obuhvaćeno 97 azilanata koji su boravili u Centru za smeštaj azilanata Obrenovac, u periodu decembar 2013–januar 2014. godine. Uzorci stolice ispitanika, ne duže od sedam dana nakon dolaska u Centar, su dostavljani u laboratoriju za parazitološku dijagnostiku Gradskog zavoda za javno zdravlje (GZZJZ) Beograd. Za pregled stolice na prisustvo crevnih protozoa i helminata korišćen je direktan nativni preparat svežeg uzorka i direktan preparat nakon primene "Mini Parasep" koncentracione tehnike. Za statističku obradu podataka korišćeni su χ^2-test podudarnosti i χ^2-test nezavisnosti. **Rezultati.** Pozitivan nalaz parazita u stolici utvrđen je kod 9,3% ispitanika, uzrastne grupe 15–24 godina. Protozoe su izolovane kod 6,2%, a helminti kod 3,1% uzoraka. **Zaključak.** Istraživanjem je ustanovljeno da je najčešće izolovana *Giardia lamblia* u stolici azilanata muškog pola iz Bangladeša.

Ključne reči:
parazitne bolesti; izbeglice; dijagnoza; stolica; srbija.

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Introduction

Parasitosis are diagnosed in recent years with increasing frequency both in Europe and other developed countries [1]. International migration of population, as an inalienable part and a result of the process of globalization, has an increasing impact on the health of the population of countries through which migrants pass or settle [2]. It is estimated that about 230 million refugees and asylum seekers circulates worldwide [2, 3]. In August 2015, the number of asylum applications in the European Union (EU) reached a record with over 148,880 applications [4]. Global demographic forecast indicate that the impact of factors that encourage international migration will become more intense in all regions of the world [2], contributing to raising local health issues to the international level [5]. Such predictions are related to diseases caused by intestinal parasites that were once considered rare and were linked only to tropical and subtropical areas as well as for areas with low living, hygienic and sanitary standards. Given that the use of human origin fertilizers is still common in certain less developed parts of the world, this can lead to the ingestion of parasite eggs over insufficiently washed vegetables and fruits [6]. Also, the process of inadequate treatment of waste water, being discharged directly into rivers and lakes, is a clear danger to human health [6]. Features of parasitic infections in immigrants can vary, as well as the time of their infestation [1]. To a large extent, they depend on exposure to parasites in the countries of origin, direction of movement and the characteristics of the areas which they finally inhabitate [1].

The data on the incidence of parasitic infections in people who have migrated to developed countries are highly variable and dependent on the various circumstances that lead to migration of the population [7], and development of the health systems of the countries with temporary or permanent immigration [8]. The overall prevalence of potentially pathogenic parasites among migrants is in the range of 8%–86% [8].

In Serbia, the data on the incidence of parasitic infections in immigrants have not yet been published. On the other hand in the United States (US) these data are available and the highest incidence of intestinal parasitosis were observed in individuals originating from Asian countries [9].

In developed countries, there is no agreement on how to control parasitic diseases brought by migrating population. Frequent diagnosis of malaria and intestinal parasites in Somali refugees registered in the US led to the implementation of the recommendations that all refugees over 2 years of age should be presumptively treated with single dose albendazole since 1997 [5]. Given the poor organized health care for refugees and a high risk of transmission of infection, the first contact with health services in the new environment should be fully focused on implementation of screening and treatment of high-risk patients [9]. In September 2015, the European Asylum Support Office (EASO) launched a project to introduce protocols for monitoring infectious diseases in immigrants [4]. In the EU countries, the recommendations include general and selective screening and careful observation of the health status of immigrants.

The aim of this study was to determine the incidence of intestinal parasitic diseases in asylum seekers at the Centre for Asylum Seekers in Obrenovac.

Methods

The study included 97 asylum seekers who were in the Centre for Asylum Seekers in Obrenovac, in the period December 2013 – January 2014. Stool samples (taken not more than seven days after arriving to the Center) were collected in special containers for feces (Dunavplast, Indjija, Serbia) and sent to the Laboratory for Parasitological Diagnosis of Public Health Institute of Belgrade. Each sample contained around 10–20 g of stool collected in the morning in the facility where asylum seekers were accommodated. For detection of intestinal protozoa and helminthes two slides were used: a direct native slide made of a fresh sample [10] and direct slide made after stool concentration by "Mini Parasep" concentrator as modified Ridley-Allan method for fecal parasite concentration (Mini Parasep® Faecal Parasite Concentrator, DIASYS, Wokingham, Berkshire, England) [11]. The concentrator consists of a freestanding mixing chamber with a 10% formalin solution and ethyl-acetate (Triton X-100 solution), two-stage filtration matrix for the elimination of large particles of about 425 μm, the chamber for dispersion of grease which removes fatty particles and remnants of feces and lower conical part where a sediment is formed by centrifugation [11]. For detection of intestinal helminthes, we also used the Kato technique [10].

Statistical analysis

Commercial software package SPSS 13.0 for Windows was used for statistical analysis of the obtained results and for descriptive statistical characteristics of examined variables. The presence of statistically significant difference between the incidence of parasitic infections in the general population of the city of Belgrade and the studied group of asylum seekers in Obrenovac was examined by χ^2-test of matching. To test differences in the prevalence of parasitic infections by special categories of the patients (gender, age, country of origin) χ^2-test of independence was used. Statistically significant difference was considered for a p-value ≤ 0.05.

Ethical aspects

Examination was carried out in accordance with ethical standards of the Helsinki Declaration from 1975 revised in 1983. Detection of parasitic infections in asylum-seekers was conducted in accordance with the legislation of the Republic of Serbia, according to the Ordinance on medical examinations of asylum seekers when entering the Asylum Centre [12].

Results

The study group comprised 97 asylum seekers from countries in the Middle East and South Asia, median age of 24.5 years, predominantly males (Table 1).

Table 1

Frequency of positive parasitological findings in the study group by age, sex and country of origin

Characteristics	Total	Positive findings
Age (years), n (%)		
0–14	6 (6.2)	0 (0)
15–24	46 (47.4)	7 (15.2)
25–34	34 (35.0)	2 (5.9)
35–44	5 (5.2)	0 (0)
45+	6 (6.2)	0 (0)
Gender, n (%)		
male	86 (88.7)	9 (10.5)
female	11 (11.3)	0 (0)
State of origin, n (%)		
Syria	18 (18.6)	0 (0)
Pakistan	50 (51.5)	4 (8.0)
Bangladesh	28 (28.9)	5 (17.9)
Afghanistan	1 (1.0)	0 (0)
Total, n (%)	97 (100)	9 (9.3)

Parasites in faeces were detected in 9/97 (9.3%) of cases. Although the sample of asylum seekers is too small, this value is significantly higher than reported by the Public Health Institute of Belgrade where the incidence of intestinal parasitism in general population on the territory of Belgrade in 2010 was 1.9% ($p = 0.000$) [13]. The presence of parasites in stool was most commonly found in male asylum seekers, 9/86 (10.5%), in the age group 15–24 years, 7/46 (15.2%) and in those who originated from Bangladesh, 5/28 (17.9%) (Table 1).

Of all positive samples (n = 9), protozoa were found in 6/97 (6.2%) and helminthes in 3/97 (3.1%). The most commonly found were *Giardia lamblia* 4/9 (44.4%), *Blastocytis hominis* 2/9 (22.2%) and *Trichuristrichiura* 2/9 (22.2%), while *Taenia spp.* was discovered in only one person 1/9 (11.1%) (Figure 1).

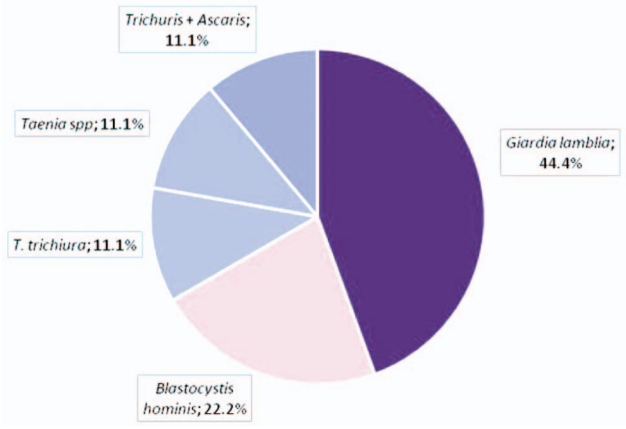

Fig. 1 – Species of parasites found in stool samples of asylum seekers.

In the group of people with positive test for parasites in stool, most people with *Giardia lamblia* were from Pakistan 3/4 (75%), ($p = 0.338$); People from Bangladesh had positive findings in stool for *Blastocystis hominis* (2/2; $p = 0.025$) and *Trichuris trichiura* (2/2; $p = 0.025$), while in asylum-seekers from Syria no parasites were found in stool samples. There were no positsive findings of parasites among children and women.

Discussion

In developed countries, a more detailed assessment of health of immigrants is performed and that can serve to identify diseases which could later become public health problem in these countries. In the United States, medical screening for adult refugees and asylum seekers is required, and it includes assessment of mental health, radiological examination of the thorax [sputum test for tuberculosis (TB) is done if radiological finding is atypical] and testing for syphilis and human immunodeficiency virus (HIV) [5]. Spanish authors point to the need of establishing prevalence and demographical characteristics of the patients with eight diseases that have potential risk of transmission: latent and active TB, syphilis, HIV, hepatitis B virus (HBV) and hepatitis C virus (HCV), Chagas disease, *Giardia intestinalis* and *Entamoeba histolytica* / *Entamoeba dispar* [14]. In Serbia, medical examination of asylum seekers, according to the Regulation from the Law on Asylum [15], under Article 3 include: history (infectious and non-communicable diseases, immunization status); physical examination; other diagnostic examinations (laboratory, Rtg) and under Article 4: laboratory testing of blood (eritrocite sedimentation rate, blood cells count); X-ray for pulmonary tuberculosis; laboratory testing of stool for: typhoid, paratyphoid and other *Salmonella*, shigellosis and intestinal protozoa [12].

In literature, there is still a dilemma whether to apply empirical therapy in groups of immigrants upon arrival to the land, or to perform the screening of parasitic infections [5]. In the United States, the accepted stand is that introducing presumptive treatment of parasitosis is necessary [5], while the EU countries point to the necessity of screening for parasites (whose life cycle is not tied to the host country), especially in immigrants who come from tropical and subtropical parts of the world, with the aim to prevent the spread of infections [16].

Although screening for parasitic infections in immigrants is legally regulated in Serbia, there is no published data on the prevalence of parasitosis in these risk groups. This study showed that the incidence of parasitosis in immigrants from countries of the Middle East and South Asia was significantly higher than the incidence of parasitosis in the general population of Belgrade territory in 2010 (9.3% vs. 1.9%, $p = 0.000$) [13]. We have no data if these persons originate from rural or urban areas. In comparison, the Mediterranean countries (Greece), reported the presence of intestinal parasites in 27.2% of immigrants from all continents and in 7.9% of those originating from the Asian countries [16]. The incidence of parasitosis in people who immigrated to Italy was recorded to be between 31%–61.9% 1,16, while in Sweden it was 36% [17]. US screening studies of 10.358 refugees showed that the incidence of intestinal parasitosis is the highest in immigrants originating from Asian countries (33.6%) [9]. The variability of data, observed in the results presented in literature, is explained by the fact that immigrants belonged to different geographical origins, had different age

groups, and living conditions (including the quality of drinking water, sanitary disposal facilities, availability of adequate footwear), eating habits, education levels and different exposure to parasites in countries which they passed through. In addition, one of the reasons for lower incidence of parasitism in our study group refers to a relatively small number of subjects, and the possibility that asylum seekers, passing through different countries on the way to Serbia, have been tested and treated for parasites.

In this study, no parasitic diseases were detected among people who migrated from Syria, which can be explained by the fact that the reason for migration in these people was fear of persecution because of different political opinions during the war in this country which is often associated with a higher educational level of refugees and their better socio-economic status. People from Bangladesh and Pakistan, who often migrate for socio-economic reasons, were more likely to be found positive for parasites in stool.

Local conditions and habits of the population have the most important role in the development and survival of the parasites [16]. In the case of certain types of helminthoses, eggs or larvae continue embryonic development in the ground or in the host before they become infective to humans [16]. Two-thirds of all asylum seekers found positive for parasitosis in this study had protozoa in stool, while one-third had helminthes. This is in accordance with the known fact that protozoa are easier to be transmitted by direct and indirect contact while helminthes are rarely transmitted by direct contact. *Giardia lamblia* was the most often found and it was present in 4.1% of immigrants originating from countries of the Middle East and South Asia. This is in accordance with data reported by Spanish authors, from the study that included 2,464 immigrants, where the incidence of *Giardia lamblia* was determined to be 5.4% [14]. In the US screening study of 10,358 immigrants from Asian countries, the most often found were *Trichuris trichiura* (7.1%), *Giardia lamblia* (5.7%) and *Ascaris lumbricoides* (2.1%) [9]. A recent Spanish study of 242 subjects has found a high incidence of *Ascaris lumbricoides* (35.5%) and *Giardia lamblia* (28.5%) among immigrants from sub-Saharan Africa [17]. Swedish study of 1,377 refugees and asylum seekers revealed that *Giardia lamblia* was found in 17% of cases and *Ankilostoma duodenale* in 19% [18]. The same study showed that intestinal parasites were more frequently found in asylum seekers from Southeast Asia (48%), Africa (43%) and South America (42%) compared to those from Eastern Europe (22%) and the Middle East (32%) [18].

Masucci et al. [1] showed that intestinal parasites were more often present in men, although some species (especially *A. lumbricoides* and *Taenia spp.*) were detected more frequently in women. In this study group of immigrants, there was ten times less women than men, and none of the women were positive for parasites. Also, parasites were not discovered in children (a total of six children of up to 4 years of age) which can be associated with the absence of parasitism in women in this study group. According to literature, the prevalence of parasitic infections is usually higher in children compared to adults, and is explained by the usual children's behavior (eating dirt or neglecting hand washing after using the toilet) which directly contributes to a higher degree of exposure to infection [16].

It is very important for the future work within the public health strategy to focus on improving the screening, monitoring and follow-up of parasitosis in asylum seekers. Also, the cost-effectiveness of screening compared to introduction of presumptive therapy should be evaluated.

Conclusion

Most intestinal parasitosis were found in asylum seekers from Bangladesh. All parasitosis were found in males and the most frequently detected parasite was *Giardia lamblia.*

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Received on November 18, 2016.
Revised on December 27, 2016.
Accepted on February 21, 2017.
Online First March, 2017.