PREVALENCE OF INTESTINAL AND NON-INTESTINAL PARASITOSEs IN VARNA REGION FOR 2013-2015: DATA FROM OUTPATIENT PARASITOLOGICAL TESTING

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ABSTRACT

INTRODUCTION AND AIM: The objective of this study is to determine the structure of the outpatient parasitology tests and the epidemiological significance of the resultant morbidity for intestinal and non-intestinal parasitic diseases in the Varna region, Northeastern Bulgaria.

MATERIALS AND METHODS: A total number of 30 687 patients tested for human parasites was investigated. Statistical analyses regarding the proportion of the tests by indications were performed and the consequential prevalence of parasitic diseases was estimated.

RESULTS: The main percentage of outpatient tests is performed with prophylactic purposes (91.38%), followed by clinical (7.67%) and epidemiological (0.95%) indications. Significant concern presents the discovered prevalence of parasitic diseases with person-to-person and foodborne routes of transmission in children (Enterobiosis - 1.18%, Giardiasis - 0.78%) and in the active adult population (Giardiasis - 0.75%, Enterobiosis - 0.59%). The higher extensity of the diseases with other mechanisms of transmission (Echinococcosis - 26.15%, Toxoplasmosis - 16.69% and Trichomonosis - 9.57%) is a result of their specific symptomology.

CONCLUSIONS: Due to the asymptomatic course, intestinal parasitic diseases are found predominately via prophylactic screening. In the current conditions of increased migration processes this "hidden" morbidity in the adult population continues to present a significant epidemiological risk.

Keywords: outpatient parasitological tests, intestinal parasitoses, prevalence, hidden morbidity

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INTRODUCTION

In the field of outpatient help in Bulgaria, laboratory testing for human parasites is executed in specialized parasitological laboratories, part of the clinical laboratories for ambulatory services. Laboratory testing is required in the presence of specific symptoms for intestinal (IPD) or non-intestinal parasitic diseases (NIPD) i.e. (clinical indications), and when the patient has been in contact with a diseased per-

son or for the purposes of the control of the treatment effect (epidemiological indications) (1,2).

The majority of the parasitic diseases in the temperate climate regions, including Bulgaria, however, have low parasite burden and are asymptomatic or with mild and unrecognizable symptoms (3,4). For a prolonged period of time those patients are epidemiologically relevant carriers and the etiological diagnosis is established accidentally when a prophylactic examination is required. In Bulgaria a specific system of healthcare legislation regulates the screening for easily transmitted intestinal parasitic diseases with yearly prophylactic examination of all children between 2 and 7 years of age, and additional testing upon admittance in nursery schools or other institutions. A prophylactic examination for IPD is demanded also for all individuals working in kindergartens, specialized institutions for children and elderly people, water supplies, and all sectors of food processing and distribution (1,2,5). In addition, outpatient screening for intestinal and non-intestinal parasites is demanded by different job and naval agencies and performed by the requirements of the international healthcare legislation for individuals working in foreign countries.

MATERIALS AND METHODS

The present study includes all outpatient tests performed in a three-year interval (01.01.2013-31.12.2015) in one of the parasitological laboratories of Varna, Bulgaria. 30 687 patients were examined and a total number of 88 861 morphological and serological tests for parasitological diagnosis were performed. The investigated pool includes patients from the city of Varna, Varna region, and different parts of Northeastern Bulgaria. The demographic structure of the data by type, tests indications and resultant morbidity and prevalence was assessed.

RESULTS

Of the 30 687 patients examined 60.9% (18689 people) were residents of Varna city, the third largest city in Bulgaria and 39.1% (11998) were patients from more than 60 villages of the Varna region and other parts of Northeastern Bulgaria. This distribution of the investigated population by residence (urban/rural) is commensurable with the official demographic data and thus may be considered representative for this administrative region (6).

The structure of the outpatient parasitological test (Table 1) shows that prophylactic examinations have a predominantly higher percentage (91.38%)

Table 1. Structure of the outpatient parasitological test by indications

Test indications		patients	%
Tests for IPD			
	Children (0-7)	14737	48.02
Prophylactic indications	Medical certificates for work (in the country)	12 063	39.31
	Medical certificates for work (abroad)	107	0.35
	Elderly patients	32	0.10
Clinical indications		1891	6.16
Epidemiological indications		248	0.81
Tests for NIPD			
Prophylactic indications	Screening in pregnancy and other	717	2.34
	Medical certificates for work (abroad)	385	1.25
Clinical indications		464	1.51
Epidemiological indications		43	0.14
Total			
Prophylactic indications		28 041	91.38
Clinical indications		2355	7.67
Epidemiological indications		291	0.95

Table 2. Diagnosed cases and prevalence of parasitic diseases in different age groups

	Children					Adults				Total		
	Tests	+	Prevalence %	± CI (p=0.01)	Tests	+	Prevalence %	± CI (p=0.01)	+	Prevalence %	± CI (p=0.01)	
IPD	Enterobiosis	15894	187	1.18	± 0.22	13162	31	0.24	± 0.11	218	0.75	± 0.13
	Ascaridosis	15677	0			13314	2	0.02	± 0.03	2	0.01	± 0.01
	Taeniarhynchosis	15677	1	0.01	± 0.02	13314	1	0.01	± 0.02	2	0.01	± 0.01
	Hymenolepidosis	15672	4	0.03	± 0.03	13297	0	0.00		4	0.01	± 0.02
	Giardiasis	15916	124	0.78	± 0.18	13076	46	0.35	± 0.13	170	0.59	± 0.12
	Blastocystosis	15902	12	0.08	± 0.06	13071	21	0.16	± 0.09	33	0.11	± 0.05
NIPD	Malaria	-	-			395	0			0		
	Trichomonosis	-	-			115	11	9.57	± 7.08	11	9.57	± 7.08
	Echinococcosis	23	0			195	57	29.23	± 8.40	57	26.15	± 7.68
	Toxoplasmosis	79	7	8.86	± 8.25	796	139	17.46	± 3.47	146	16.69	± 3.25
	Toxocarosis	9	1			-	-			1	11.11	± 27.03
	Trichinellosis	-	-			6	0			0		

than tests performed for all other purposes. The majority of them is composed of testing for intestinal parasites (87.79%) which is usually performed as complex for every patient as required by the previously described provisions of healthcare legislation.

Table 2 shows the number of the diagnosed parasitic diseases in children and adults and the resultant total prevalence.

Intestinal Parasitic Diseases

An overall number of 328 children between age 1 and 18 were diagnosed with intestinal parasitic infection. In 8 cases a coinfection of more than one pathogen was diagnosed (4 cases of *G. lamblia* + *B. hominis*, 3 cases of *G. lamblia* + *E. vermicularis* and 1 *H. nana* + *B. hominis*). The majority of infected children were in the age group between 1 and 7 (96.51%), and the tests were executed as result of mandatory prophylaxis (95.42%). Only 12 diagnoses were confirmed on the basis of relevant clinical symptoms. In the age groups between 7 and 18, the testing for IPD is performed solely on clinical or epidemiological indications and 4 cases of Giardiasis and 6 cases of Enterobiosis were confirmed. In the entire children age group epidemiological connections between 14 cases of the infected with *E. vermicularis* were discovered (6 family and 8 outbreaks in nursery schools). Another 7 family and 3 outbreaks in nursery schools were discovered among the patients with *G. lamblia* infection. A total number of 11 relapses of the Giardiasis were registered due to improper or insufficient treatment. In 3 of those cases the infection or re-infection continued until the discovery and treatment of at least one more infected member from the family.

In the adult population (age 18-87) a total number of 99 patients with IPD was discovered with 2 cases of co-infection between *G. lamblia* and *B. hominis*. The majority of the infected were confirmed by prophylactic examination (95%) or on the basis of epidemiological connections between the patients. No IPDs in adults were identified on the basis of clinical symptoms except for the specific manifes-

tations of the large intestinal helminths - Ascariasis (evacuation of the worm) and Taeniarhynchosis (shedding of the proglottids). All patients diagnosed with IPD were referred to their general practitioner with specialized instructions regarding prescription. They were removed from the work environment and reinstated after laboratory confirmation of the effective treatment. More than 1/3 of the infected adults reported unacknowledged symptoms (dyspepsia, high stomach acidity, flatulence, loose stool or constipation) or previously documented diagnosis (reflux esophagitis, gastritis and irritable bowel syndrome) without prior parasitological testing.

Non-Intestinal Parasitic Diseases

For the non-intestinal parasitic infections the resultant higher extensity (Table 2) is relevant to the prominent symptomology and the larger percentage of clinically indicated tests. The screening for Toxoplasmosis in pregnancy revealed seroprevalence of 16.69% in the investigated population and 13 cases of suspected acute Toxoplasmosis, were referred for confirmation to the National Referent Laboratory for Toxoplasmosis. No positive results regarding Echinococcosis were observed in children. In the adult group, 5 new cases of Echinococcosis were identified and prescribed surgical treatment. The higher prevalence of Echinococcosis (26.15%) is due to the mandatory monitoring (every 6 months) of previously diagnosed patients via serological testing.

DISCUSSION AND CONCLUSIONS

The ambulatory parasitological tests based on the unique organizational structure of the outpatient parasitological help in Bulgaria are a sufficient ground for establishing the morbidity of some of the most common parasitic diseases.

Our study shows that the highest prevalence in Varna region have the easily transmitted by contact IPD (Enterobiosis – 0.75%, Giardiasis – 0.59%, Blastocystosis – 0.11%). Those numbers are comparable with the results from our previous researches (Enterobiosis – 0.44%, Giardiasis – 0.43%, Blastocystosis -0.10%) and an alarming trend for increasing of the prevalence of the Enterobiosis is observed (5, 7, 8). The structure and prevalence of both infections are reciprocal to the trends reported for entire country (Enterobiosis – 0.7%, Giardiasis – 0.4%, Blastocystosis - 0.27% for 2011; Enterobiosis – 0.6%, Giardiasis –

0.44%, Blastocystosis - 0.26% for 2012)(1), (2) and in parallel with the clinical and demographic findings reported by other authors (9,10).

The efficient prophylaxis standards and their proper execution in the age group 1-7 years of age guarantee adequate control of IPD diseases in children communities and institutions. It also provides objective assessment of the morbidity prevalence in this age group (Enterobiosis – 1.18%, Giardiasis – 0.78%) and allows the application of proper epidemiological measures for limitation of the outbreaks.

The prophylactic standard for the actively working adults gives us the opportunity to reveal the prevalence of the IPD in a large group of the population in the region-people providing care for children and elderly people; maintaining water supplies and all sectors of food produce and distribution (storage, trade, tourism). As commerce and tourism represent a major portion of the economics of the Varna region this gives us a proper view of the distribution of the IPD in a large quota of the adult population. The prevalence of IPD (Giardiasis – 0.35%, Enterobiosis – 0.24%) is lower than the reported numbers among the children but still presents a substantial health threat as all of the diagnosed cases were essentially asymptomatic carriers for an unknown period of time prior to the etiological diagnosis and potential sources for distribution of the intestinal parasitoses.

These findings validate the significance of the prophylactic testing for the public health and justify the continuous screening for IPD in Bulgaria.

In the age groups between 7-18 and adults who are not a subject of prophylactic examination due to the insignificant number of the appointed tests, the structure of the IPD continues to be unrecognizable and unrecognized. It is sufficient to estimate that in those parts of the population a “hidden” morbidity from IPD persists and it constitutes a noticeable group of undiagnosed potential sources of parasitic infections.

The “hidden” morbidity from IPD and the delayed diagnostics represent an essential epidemiological risk mainly for the active adult population. Its significance is increased particularly in the terms of free movement in the European Union and under the conditions of intensified migration processes (war refugees, migrant workers etc.). Optimization

and proper execution of the existing internal legislation and international regulations is vital for the proper control of the global distribution of the parasitic diseases.

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