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OPIS PRZYPADKU
CASE REPORT

Gastrointestinal parasitosis diagnosed by colonoscopy as cause of weight loss in 46-year-old woman with three negative stool tests for presence of parasites

Parazytoza przewodu pokarmowego rozpoznana w kolonoskopii jako przyczyna spadku masy ciała u 46-letniej kobiety z ujemnym wynikiem trzykrotnie wykonanego badania kału na obecność pasożytów

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ABSTRACT

Parasitic infections of the digestive tract remain an important health problem on a global scale. The current epidemiological situation in Poland is unknown because most parasitic diseases, including all caused by helminths, are not subject to reporting. Clinical practice shows that diseases of such etiology are sometimes overlooked in the process of differential diagnosis. In addition, the commonly available classical examination of a stool sample utilizing a light microscope is a relatively low-sensitivity test. This study presents a case report of a 46-year-old patient admitted to the Clinic for planned diagnostics due to weight loss without other gastrointestinal symptoms. In the course of the diagnosis, it occurred that the cause of the weight loss was a parasitic infestation of the gastrointestinal tract with roundworms, which were observed in a colonoscopy, but no parasites were found in the collected material in stool examinations performed three times. The presented case report demostrates that parasitic diseases still should be taken into consideration in clinical practice in the process of differential diagnosis. In addition, further effort is needed to improve the sensitivity of parasitological diagnostic methods. Moreover, there is a need for research on the current epidemiological situation in Poland in the field of gastrointestinal parasitosis.

KEYWORDS

intestinal parasitosis, roundworms, stool test, weight loss

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STRESZCZENIE

Zarażenia pasożytnicze przewodu pokarmowego pozostają ważnym problemem zdrowotnym w skali globalnej. Aktualna sytuacja epidemiologiczna w Polsce nie jest znana, ponieważ większość chorób pasożytniczych, w tym wszystkie robaczyce, nie podlega obowiązkowi raportowania. Praktyka kliniczna pokazuje, że choroby o takiej etiologii bywają pomijane w procesie diagnostyki różnicowej. Ponadto powszechnie dostępne klasyczne badanie próbki kału w mikroskopie świetlnym jest badaniem o stosunkowo niskiej czułości. W pracy przedstawiono opis przypadku 46-letniej pacjentki, przyjętej do Kliniki w celu planowej diagnostyki z powodu spadku masy ciała, bez innych dolegliwości ze strony przewodu pokarmowego. W toku diagnostyki wykazano, że przyczyną spadku masy ciała była infestacja pasożytnicza przewodu pokarmowego robakami obłymi, co stwierdzono w kolonoskopii, natomiast trzykrotnie wykonane badanie kału nie wykazało obecności pasożytów w pobranym materiale. Przedstawiony opis przypadku pokazuje, że o chorobach pasożytniczych nadal należy pamiętać w praktyce klinicznej i uwzględniać je w procesie diagnostyki różnicowej. Ponadto potrzebne są prace nad poprawą czułości metod diagnostyki parazytologicznej. Konieczne są również badania dotyczące aktualnej sytuacji epidemiologicznej w Polsce w zakresie parazytoz przewodu pokarmowego.

SŁOWA KLUCZOWE

parazytoza jelitowa, robaki obłe, badanie kału, spadek masy ciała

INTRODUCTION

Parasitic diseases of the gastrointestinal tract are still among the most important public health problems worldwide. Among the parasitic infestations of the gastrointestinal tract, diseases caused by protozoa and diseases caused by helminths can be distinguished. Helminths can be further divided into flatworms and roundworms. The list of the most important etiological factors of parasitic infestations of the gastrointestinal tract is presented in Table I [1,2,3].

Table I. List of selected major etiological factors of intestinal parasitic infestations

Protozoa	Helminths	
	flatworms	roundworms
Giardia intestinalis	*Taenia saginata*	*Ascaris lumbricoides*
Entamoeba histolytica	*Taenia solium*	*Enterobius vermicularis*
Balantidium coli	*Diphyllobothrium latum*	*Ancylostoma duodenale*
Cryptosporidium parvum	*Echinococcus granulosus*	*Trichuris trichura*
Blastocystis hominis	*Echinococcus multilocularis*	*Strongyloides stercoralis*

Experience in medical practice shows that parasitic diseases of the gastrointestinal tract are often not taken into account in the process of the differential diagnosis of such symptoms as weight loss, abdominal pain, and irregular bowel movements. Therefore, it is not surprising that the term "neglected diseases" is sometimes used in relation to parasitic diseases of the gastrointestinal tract [4]. The clinical picture of gastrointestinal parasitic infestations is variable and depends on such factors as the location of the infection, secondary changes in the mucosa, competition for nutrients, and the severity of the invasion. The most common symptoms associated with gastrointestinal helminths include weight loss, abdominal pain, and diarrhoea [3]. Diseases caused by helminths are often mildly symptomatic and the mortality rate of these diseases remains low. It is postulated to be the result of evolutionary mechanisms that led to a certain adaptation between the parasite and the host, which is associated with the modulation of the immune response [5]. There are some reports suggesting that helminth therapy may be useful in the treatment of selected autoimmune diseases [6].

The purpose of this article is to present the case report of a patient hospitalized in the Clinic of Internal Medicine, Angiology, and Physical Medicine, diagnosed with gastrointestinal parasitosis based on colonoscopy, whereas three stool tests for the presence of parasites were negative.

CASE REPORT

Anamnesis and physical examination

A 46-year-old patient was admitted to the Clinic for planned diagnostics. In the medical history she reported a weight loss of about fifteen kilograms in a month with no other complaints from the digestive tract. No abnormalities were found in the physical examination. The patient had been treated until then for microcytic anaemia with oral iron supplementation with good results (no features of anaemia were found in the laboratory tests during hospitalization). She declared that she had no allergies but admitted to smoking cigarettes.

Laboratory tests

In terms of laboratory diagnostics, the following tests were performed: peripheral blood count parameters, coagulation parameters (prothrombin time and activated partial thromboplastin time), inflammation parameters (red blood cell sedimentation rate, C-reactive protein – CRP, and fibrinogen levels in the blood), kidney function parameters (creatinine), parameters of damage and function of the liver and pancreas (activity of aminotransferases, amylase, alkaline phosphatase, and gamma-glutamyl transpeptidase as well as the blood concentration of bilirubin), lipid profile parameters (total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and triglycerides), tumour markers (alpha-fetoprotein, carcinoembryonic antigen, and carcinoma antigen 125) as well as the concentration of electrolytes (sodium, potassium), glucose, uric acid, thyrotropin, beta-gonadotropin subunit, vitamin B12, and a general urine test.

The performed laboratory tests showed an increased concentration of glucose in the fasting venous blood plasma (103.1 mg/dL), an increased value of the red blood cell distribution width – a coefficient of variation (17.8%) as well as the presence of bacteria, leukocytes, erythrocytes, and nitrites in a general urine test.

The results of the other tests were normal. Especially the inflammatory parameters were normal (including CRP 0.37 mg/L). The number of leukocytes in the peripheral blood count was normal (7 200/µl), and what is important, the percentage of individual leukocyte subpopulations was within normal limits, including the number of eosinophils in the peripheral blood, which was normal (400/µl; 6.1% of white blood cells).

Diagnostic imaging

As part of the imaging diagnostics of weight loss, an abdominal ultrasound, chest X-ray, and computed tomography (CT) of the abdomen and small pelvis after the administration of oral and intravenous contrast agents were performed. Abdominal ultrasound revealed a borderline liver size with features of steatosis and uterine myoma was suspected, which was confirmed by CT scan of the abdominal cavity and small pelvis. CT also revealed a functional ovarian cyst with no other changes. The chest X-ray was described by the radiologist as normal.

Endoscopic diagnosis of gastrointestinal tract

As part of the diagnosis of weight loss, endoscopic examinations of the gastrointestinal tract (i.e. gastroscopy and colonoscopy) were performed. The gastroscopy revealed features of chronic gastritis with *Helicobacter pylori* infection. The colonoscopy showed numerous mobile white roundworms in the cecum and ascending colon. In addition, inflammatory changes were found in the mucosa of the appendix opening. Photos taken during the colonoscopy are presented in Figure 1 (A and B).

A

B

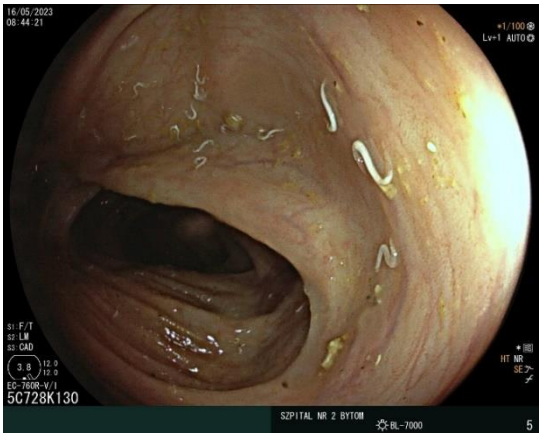

Fig. 1. Roundworms in colonoscopy image.

Stool tests for parasites

After receiving the colonoscopy results, a stool examination for the presence of parasites was performed. Nevertheless, it turned out that no parasites were found in the stool sample. The test was repeated two times within a week and no parasites were found in the test samples. Despite this, antiparasitic treatment was prescribed due to the unequivocal colonoscopy findings.

Treatment

Owing to the diagnosis of parasitic infestation with roundworms, pharmacological treatment with mebendazole was started. After the end of hospitalization, the patient remained under the care of the Gastroenterology Out-Patient Clinic at Specialist Hospital No. 2 in Bytom. After the treatment, the patient felt better and she began to gain weight.

DISCUSSION

Epidemiology of intestinal parasitic infections

The results of epidemiological studies show that intestinal parasitosis continues to be a serious problem in the world. According to the results of a systematic review and meta-analysis by Holland et al. [7], in 2021 around 732 million people were infected with *Ascaris* roundworms worldwide. The incidence of this infection was estimated at 11.01% (95% confidence interval: 10.27–11.78%) and it varied geographically, ranging from 28.77% in Melanesia (Oceania) to 1.39% (1.07––1.74%) in Eastern Asia. The results of most of the epidemiological studies available in the literature on gastrointestinal parasitic diseases come mainly from countries with a lower socioeconomic status. At a tertiary care center in Lebanon, the incidence of intestinal parasitic infections slightly decreased after the period of restrictions related to the COVID-19 pandemic although it remains relatively high (13.2% vs. 7.5%) [8]. Among children in pastoralist and agro--pastoralist communities in the Adadle woreda of the Somali Regional State of Ethiopia, the incidence of single parasitic infestations was estimated at 30.6% and at 4.4% for multiple infections, whereas the prevalence of intestinal helminthiasis was 14.5% [9]. According to Gebru et al. [10], intestinal parasitic infections continue to be an important public health problem in rural parts of Dire Dawa (Eastern Ethiopia). The following factors are significantly associated with the risk of the occurrence of such an infection: solid waste management, latrine cleanliness, the mothers' level of education, and child swimming habits in unclean accumulated water. According to Wondimu and Mihret [11], 45.71% of food handlers in Northwest Ethiopia have such parasites as *Ascaris lumbricoides* (35.63%), hookworm (19.38%), *Entamoeba histolytica/dispar* (16.25%), *Trichuris trichiura* (10.00%), *Strongyloides stercoralis* (8.13%), *Schistosoma mansoni* (6.88%), *Cystoisospora belli* (1.25%), *Hymenolepis nana* (1.25%), and *Taenia* sp. (1.25%). The prevalence of intestinal parasitic infestations in rural and urban areas in Pakistan has been found at a level of 21% [12].

The epidemiological situation in Poland concerning the majority of gastrointestinal parasitoses, including all infections caused by roundworms and flatworms, remains unknown because there is no obligation to report the disease to the state sanitary authorities [13]. The case report presented by us confirms that research is needed to show the current epidemiological situation in Poland regarding parasitic infestations of the gastrointestinal tract. Contrary to popular belief, this problem does not affect only people with a low socioeconomic status but can affect any patient, thus this group of diseases should not be forgotten in the differential diagnosis of such disease symptoms as weight loss, diarrhoea, and abdominal pain. In a study conducted on a group of 206 schoolchildren in Spain, it was found that the incidence of intestinal parasitosis is as high as 49.5%, while the incidence of multiple infections was estimated at 14.6%. Infections were mainly caused by *Giardia intestinalis*, *Blastocystis* sp., and *Enterobius vermicularis* [14]. It is worth noting that Spain is a country with a socioeconomic status similar to Poland.

Efficiency of parasitology diagnostics

The presented case report shows that the sensitivity of parasitological diagnostics is currently not satisfactory. In the presented case, the stool examination for the presence of parasites was performed three times and each time no parasites were found in the sample although parasitic infestation of the gastrointestinal tract with roundworms was evident. In most hospitals in Poland, including our laboratory, stool tests for the presence of parasites are performed only by the method of assessing the direct preparation by means of light microscopy. The sensitivity of the test increases when additional concentration methods are used. Such modification increases the probability of recognizing the structure of the parasite actually present in the test sample. These techniques include flotation and sedimentation methods [15]. The mentioned methods are available only in a few centres in Poland [13].

According to the literature reports, research is being conducted in the world to improve the quality of parasitology diagnostics, especially in countries where this problem is considered to be more widespread. Molecular methods meet with growing interest in parasitology diagnostics. Such methods have already been developed for such parasites as *Cryptosporidium* spp., *Giardia intestinalis*, *Entamoeba histolytica*, *Ancylostoma duodenale*, *Ascaris lumbricoides*, *Necator americanus*, *Strongyloides stercoralis*, and *Opisthorchis viverrini*, among others [16,17,18]. The literature describes studies that aimed to develop available tools and methods to improve the sensitivity of parasitological diagnostics. Recently, a study was

published that evaluated the usefulness of the AVE-562 automatic analyzer (AVE Science & Technology Co., Hunan, China) in the diagnostics of infections caused by *Clonorchis sinensis*, which is the most common intestinal parasite in Korea [19]. Moreover, research is underway to improve disposable equipment employed to concentrate faecal samples for parasitology tests and Mini Parasep® solvent-free (SF) tubes is an example of such equipment [20].

CONCLUSIONS

The presented case report demonstrates that parasitic intestinal infestations should not be omitted in the differential diagnosis of symptoms suggesting a gastrointestinal disease, also in countries with a high level of socioeconomic development. Furthermore, the presented case report shows the limited diagnostic value of the classic stool test for intestinal parasitic infestations with roundworms. The presented case report leads to the reflection that parasitic diseases of the gastrointestinal tract should focus more attention both on the side of the organization of sanitary services and the health care system, among practitioners and scientists, because it is necessary to broaden the knowledge about the current epidemiological situation in Poland, and it is necessary to search for more effective diagnostic methods.

Author's contribution

Study design – G.K. Jakubiak, M. Pietrzak, G. Cieślar, A. Stanek
Manuscript preparation – G.K. Jakubiak, M. Pietrzak, G. Cieślar, A. Stanek
Literature research – G.K. Jakubiak
Final approval of the version to be published – G.K. Jakubiak, M. Pietrzak, G. Cieślar, A. Stanek

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