

Etiopathogenetical common aspects of ascaridosis and chronic pancreatitis: optimization of treatment in the family doctor practice

L. S. Babinets, Y. V. Dronyak

Ternopil State Medical University n. a. I. Y. Gorbachevsky, Ukraine

Key words: chronic pancreatitis, ascaridosis, trophological status, optimization of treatment, albendazole

Introduction. The observations of recent years indicate that the clinical course of many diseases is changing: a growing number of patients with severe forms of disease that are often not amenable to standard therapies. The results of years of research show that in this group of patients fail therapy due to undiagnosed parasitic diseases. As pointed out by some authors, parasitic diseases are often the last link in the chain of differential diagnostic thinking doctor also underestimated importance of ascariasis and intestinal worms, which is the first cause of the pathology of the gastrointestinal tract. There is no exception for the pancreas [3, 9].

The aim of the study is to conduct an analysis of the literature on the impact of ascaridosis on the occurrence and clinical course of acute (AP) and chronic pancreatitis (CP), as well as the feasibility of taking into account the identified schemes of ascaridosis treatment and prevention of CP in the practice of family doctors.

The main part. The most commonly roundworm affects pancreas. *Ascaris lumbricoides* — round worm, which can be localized in all human organs and tissues, showing both local and general pathogenic effects on the body. Ascariasis characterized by signs of chronic intoxication and allergization human body, a violation of the immune system, respiratory and digestive tract, myalgia, lymphadenopathy, iron deficiency anemia. As a result, there is a decline in health, and hence in the quality of life of patients. In roundworm infected children have delayed mental and physical development. Dangerous these parasites and their mechanical action on the human body, the ability to induce life-threatening

complications such as blockage of ducts of pancreatobiliary system, liver abscesses and pancreas, bowel perforation with peritonitis, obstructive ileus and others [4].

In the pathogenesis of lesions pancreas roundworm emit not only mechanical but also allergic factor. The presence of the latter explains the development of CP even after their removal. This ascaris allergens are among the most severe parasitic allergens. There are general and local hypersensitivity reactions, which leads to eosinophilic infiltrates in the lungs, liver and pancreas [14, 17]. Morphological changes in the pancreas clearly correlated with clinical markers, angioneurotic edema, skin rash (urticaria), blood eosinophilia, increased immunoglobulin in blood plasma.

Clinical symptoms of ascariidosis are characterized by AP and CP symptom-complex (abdominal pain syndrome, pancreatic or biliary hypertension, dyspeptic symptoms and manifestations of exocrine insufficiency). The severity of pancreatitis depends on the location and intensity of parasite infestation. If the infestation is only in pancreatic duct, the AP is usually easy. If the invasion of pancreatic and bile duct blockage major duodenal papilla with, the developing hard, often complicated AP (20% of cases) with possible fatal consequences (death rate — 13%) [11].

Less destruction pancreas is in the form of CP, which is due to re-infestation of parasites choledochitis and/or Wirsung's duct or allergic factor. When migrating roundworm in duct (usually in the main pancreatic duct (MPD), at least — in the lateral pancreatic duct) there is violation of the outflow of pancreatic juice with the development of AP of varying severity, even to total pancreatic necrosis. The incidence of severe pancreatitis destructive of all cases against the background of ascariidosis is 4.8%. Often accompanying complication AP is the mechanical strain of the mucous membrane of pancreatic duct, bile ducts to the development of bleeding [8]. In addition, the development of obstructive pancreatitis may be associated not only with pancreas ducts obturation older persons but also their eggs obturation worms. There are cases where patients

within a few months and even years after the first attack obstructive AP in a survey on recurrent CP was the cause of the disease — obstruction of MPD or small ducts by dead ascaris complex formation of calcifications. There are cases of abscesses and omental pancreas, pancreas cysts as a result of long roundworm parasites in MPD. With frequent causes of complications caused by migration of worms, note the following: acute intestinal obstruction, acute hepatitis, suppurative cholangitis [8, 9].

Severe signs occur when the penetration of *Ascaris* not only in pancreas but also in other organs. When roundworm migration to other organs, the conditions for accession to the development of bacterial infection complications purulent character (abscess, cholangitis, pancreatitis, etc.) [5]. Noted feature when re-infection — Pathological changes are less pronounced than in primary infection, which may indicate a kind of immunity in ascariasis. Immunity to re-invasion stored for several months. *Ascaris* protein antibodies can be detected in 5-10 days after infection, 3 months, they are usually not detected. In large stake ascariasis people create immunity to superinvasion and reinvasion explaining completion infection in the early stages of development in 25% of patients [2].

There are some pathognomonic symptoms which suggest ascariasis as a cause pancreatitis — a relatively greater frequency than in other etiologies of AP, registered in the right upper quadrant pain and jaundice of the skin and mucous membranes. More than 1/3 of patients in vomit detect roundworm in 2/3 of cases — in the feces. Most experts acknowledge that the presence of roundworm in the stool and/or vomit in patients with AP clinic are likely indicates a parasitic disease etiology. One of the indirect symptoms, which suggests parasitic etiology is preliminary sudden attack of progressive weight loss. You should also provide an appropriate place such complaints, which are caused by lesions of the small bowel, respiratory, allergic reactions varied, complaints caused by partial, rarely complete intestinal obstruction due to obstruction of the digestive tract roundworm clusters [8, 11, 13].

According to parasitological monitoring, virtually every person in our country for life at least once was infected by worms. The annual incidence rate of helminthiasis in Ukraine, according to experts, is 1,333 cases per 100 thousand of population. Despite the fact that in Ukraine there are about 30 species of worms that parasitize the human body, the most common diseases are just a few: enterobiosis, ascariasis, trematodoz. The incidence of ascariasis is 138.01 per 100 thousand of population. Among patients 60% are urban residents, of which 65% — children. Every year there are nearly 65 thousand new patients [7]. These regional sanitary and epidemiological stations and Ukrainian Center for Sanitary and Epidemiological Surveillance indicate that the prevalence of ascariasis in Ukraine continues to grow.

A large number of infections occur in Asia and Latin America. Among the urgent hospitalization of children in endemic areas incidence ascariasis 50-60% of the hospitalization, and the frequency of lesions of the biliary tract roundworm and pancreas ranging from 1.4 to 10.0% of all cases of acute surgical pathology of abdominal organs. The frequency of AP in ascariasis respect of all cases of emergent conditions of the biliary tract and pancreas more — exceeds, according to various sources, 15 and 23% of cases.

The frequency of diseases of the biliary tract and pancreas varies according to different authors. For example, in Kashmir (India) 5 adults surveyed in 1105 by ultrasound were discovered in the roundworm biliary tract, and in the region ascariasis recognized in the same common disease as cholelithiasis. In the same region with 500 patients with hepato-biliary and/or pancreatic manifestations of ascariasis in 6.0% of cases the first manifestation was AP. In the same part of India with 256 patients diagnosed with AP etiological factor of the disease in 23.0% of cases was ascariasis [16]. In endemic countries is causing ascariasis biliary tract disease and pancreas — in a third of cases.

All the above information clearly shows the relevance consideration as etiological factors of CP — ascariasis. Also, it is reasonable to consider the fact that ascariasis available or of past influences the clinical course of CP, makes it

difficult, deepens trofolohichni disorders — weight loss, anemia, vitamin deficiencies, immune deficiency and other displays that show the quality of life. Especially important it is to practice primary care doctor — a pediatrician and the district physician and family doctor.

Therefore, it is important to diagnose ascariasis in patients, especially with severe disease as CP. Let's start with general clinical methods. Early (migratory) phase of ascaridosis is characterized by leukocytosis (with massive infestation — expressed hyperleukocytosis), eosinophilia, which in some cases reach 30-40%. Eosinophilia show and late (intestinal) phase, it is quite mild and rarely exceed 10-12%. Sometimes remains insignificant leukocytosis, anemia occurs (sometimes severe).

Among serological techniques that can be applied by physician, urgent are: precipitation reaction in vivo roundworm larvae (E.S. Lyeykina method), the reaction of indirect hemagglutination, latex agglutination reaction acceleration of erythrocyte sedimentation (by Krotov). Encouraged methods are based on the detection of volatile fatty acids in saliva and urine by M.J. Soprunov. However, having a scientific importance (the study of immunity, epidemiology, pathogenesis), the widespread practice of primary health care serological methods not included [6].

There are also methods of specific diagnostics. In the migration phase the larvae can be found in the sputum. However, the number of larvae is relatively small, since most of them dying during migration, besides they are changeable. Therefore, when suspected a patient migration phase ascariasis fresh sputum should be examined very carefully, and research conducted repeatedly. In late (intestinal) phase in faeces detected roundworm eggs, sometimes very roundworm (immature or mature). Use thick smear method or the method by Kato enrichment (Fyuleborn, Kalantaryan etc.). You can find large (60x50 mm) brown egg sandwich. In cases of the fertilized eggs their surface is rough due to mucopolysaccharides. Coprogram is negative if the intestinal parasitic males only, and if the worms have not yet reached puberty or is just old worms that do not

produce eggs. However, a clear analysis of indicators coprogram to identify phenomena exocrine insufficiency Syndrome (creatorrhea, amylopoorria, liyentereya, steatorrhea), and enterocolitis associated signs of dysbiosis colon is always a signal to family doctors in the need to search deeper towards ascariasis. Revealing his treatment will make CP a more precise etiology directed and rehabilitation activities will be more successful.

In the family doctor is also possible to assign additional methods of examination. Radiography can provide substantial assistance in the migration phase of ascariasis. A comparison of radiographs taken at intervals of several days, can catch the "migration" infiltrations, which in combination with blood eosinophilia is already a serious argument in favor of ascariasis. In late (intestinal) phase of the digestive tract X-ray with contrast agent (barium) can sometimes detect roundworm in the lumen of the small intestine in a typical bar-like illumination with clear contours and pointed ends.

To prove that pancreatitis caused by ascariasis, you must perform sonography (at primary or secondary levels of care and / or endoscopic retrograde cholangiopancreatography (ERCP) — in specialized clinics. In sonogram parasites displays in choledoch and/or gallbladder how long narrow echogenic body, not giving an acoustic shadow with a longitudinal lumen inside. Sometimes set of parallel spaced parasites in the enlarged common bile and/or pancreatic ducts are defined. In choledoch roundworm displays in 86,0-91,0% of patients with biliary ascariasis and half of the patients symptoms of pancreatitis [12, 18].

In case of ascariasis in patients with CP, the treatment and prevention of ascariasis should be added to CP comprehensive treatment measures. Non-specific and specific prevention and treatment — key tools opposition of most helminths that affect the human body. Traditionally, non-specific methods of prevention include careful personal hygiene, environmental improvement by improving the quality of cleaning and disinfection of wastewater and educational activities aimed at improving hygienic culture of the population, including doctors. Non-specific

prevention shows most people at risk, primarily children and adults who have contact with animals and sick people.

Specific prevention based on preventive use in patients who are at risk, anthelmintic drugs. They must have not only expressed as activity against a wider range of worms mature, their eggs, larvae and cysts, but sufficient security, primarily on the child's body [10]. Particularly relevant is the approach for patients with CP that requires careful selection of anti-parasitic drug.

From this perspective, special attention should be paid to carbamatbenzimidazoles drugs from the group in the first place — albendazole. Albendazole has high therapeutic activity against most intestinal nematodosis, including dominant in Ukraine and Enterobiasis ascaridosis and cestodosis, trematodosis and giardiasis. The spectrum of anthelmintic albendazole activity surpasses all other antiparasitic drugs.

Albendazole has "double hit" on worms, disrupting the function of the microtubular apparatus with damage of tubuline protein and inhibiting glucose transport and fumaratreductase. The consequence is termination of ATP synthesis in worms, suppression of cell division at metaphase, inhibiting egg laying and larval development.

The drug, which is absorbed in the internal environment of the human body is transformed into albendazole sulfodioxide, which reaches plasma and tissue concentrations high, providing significant anthelmintic effect of the drug. Albendazole absorption process takes about 9 hours, whereas time spent in the body — more than 17.3 hours. The drug is metabolized by the liver and excreted in the bile, and therefore on effective and worms, parasites in the liver and biliary tract [1].

Considering convenient release form (chewable tablets 400 mg and suspension, 5 ml of which contained 200 mg) and albendazole high safety, it can be used for preventing and treating helminthiases even in children since the age of two. Expressed albendazole anthelmintic effect allows even the treatment regimen

of single dose of 400 mg and repeat the course in 2-3 weeks. Depending on the type of helminthiasis treatment can last for 10-15 days.

From prevention to albendazole is recommended to take 2 times a year to all members of the family of 400 mg (1 tablet or 10 ml suspension) 1 once a day for 3 days [1, 10].

Conclusions:

1. The following information in the review clearly demonstrates the relevance consideration of ascariidosis as etiological factor of CP.

2. Ascariidosis available or of past influences the clinical course of chronic pancreatitis, complicating it, deepening trophological disorders — weight loss, anemia, vitamin deficiencies, immune deficiency and other displays that show the quality of life of the patient, which is especially important in the practice of primary care physicians — district pediatrician and general practitioner and family physician.

3. Identification of ascariidosis will make CP treatment more precise, etiology more directional (appropriate course is to include albendazole) and rehabilitation activities will be more successful.

Prospects for further research — the study of clinical course and depending trophological disorders in CP in the presence of concomitant ascariidosis and development of optimal treatment regimens.

References

1. Ананко А. А. Новое и старое в лечении и диагностике острого панкреатита. Взгляды на проблему с точки зрения доказательной медицины / А. А. Ананко // Укр. мед. часопис. — 2007. — № 6 (62), XI/XII. — С. 59–62.
2. Возіанова Ж. І. Інфекційні і паразитарні хвороби; У 3 т. — К. : Здоров'я, 2000. — Т. 1. — С. 890–903.
3. Корнакова Е. Е. Осторожно: паразиты человека! / Е. Е. Корнакова — СПб. : ИК «Невский проспект», 2002. — 128 с.
4. Медицинская паразитология : уч. пособие / Под ред. Р. Х. Яфаева. — 2-е изд., перераб. и доп. — СПб. : Фолиант, 2003. — 128 с.
5. Овнатаян К. Т. Аскаридоз печени и желчных путей / К. Т. Овнатаян. — Дзауджикау: Гос. изд-во Северо-Осетинской АССР, 1952. — 115 с.
6. Паразитарные болезни человека, их профилактика и лечение / В. П. Сергиев, М. Н. Лебедева, А. А. Фролова, Н. А. Романенко // Эпидемиология и инфекционные болезни. — 1997. — № 2. — С. 8–11.
7. Паразитизм як біологічне явище : навчальний посібник / В. О. Гоженко, О. П. Корж, Н. В. Воронова, Л. М. Тітова. — Запоріжжя : ЗДУ, 2001. — 130 с.
8. Паруль А. В. Острый панкреатит, вызванный аскаридозом протока / А. В. Паруль, С. В. Анискевич // Здоровоохранение Белоруссии. — 1986. — № 3. — С. 66–67.
9. Покровский В. И. Роль инфекционных факторов в патологии желудочно-кишечного тракта / В. И. Покровский // Мед. паразитология. — 1997. — № 3. — С. 3–5.
10. Сучасні методи лікування основних паразитарних хвороб людини : метод. рекомендації / Р. Г. Лукшина, К. І. Бодня, І. К. Москаленко [та ін.]. — Харків : ХМАПО, 2004. — 39 с.
11. Ascaris-induced acute pancreatitis / M. S. Khuroo, S. A. Zargar, G. N. Yattoo [et al.] // Br. J. Surg. — 1992. — Vol. 79. — P. 1335–1338.

12. ERCP in acute pancreatitis / J. V. Cherian, J. V. Selvaraj, R. Natrayan, J. Venkata-Raman // *Hepatobiliary Pancreat. Dis. Int.* — 2007. — Vol. 6, No 3. — P. 233–240.
13. Ferreyra N. P. Ascariasis of the alimentary tract, liver, pancreas and biliary system: its diagnosis by ultrasonography / N. P. Ferreyra, G. G. Cerri G. G. // *Hepatogastroenterology.* — 1998. — Vol. 45, No 22. — P. 932–937.
14. Haburchak D. R. Ascariasis / D. R. Haburchak. — Last Updated: February 15, 2002, eMedicine.com, Inc. (2004).
15. Hokeleek M. Nematode infections / M. Hokeleek, L. Luwick, A. Cua. — Last Updated: January 17, 2003, eMedicine.com, Inc. (2004).
16. Khuroo M. S. Hepatobiliary and pancreatic ascariasis in India / M. S. Khuroo, S. A. Zargar, R. Mahajan // *Lancet.* — 1990. — Vol. 335. — P. 1503–1506.
17. Medrano Y. P. Ascariasis en vHas biliares / Y. P. Medrano, A. P. Diaz, J. H. D. Castro // *Kirurgia.* — 2006. — Vol. 3. — P. 29–34.
18. Pancreatic duct ascariasis: sonographic diagnosis — a case report / A. Agarwal, V. Chowdhury, N. Srivastava [et al.] // *Trop. Gastroenterol.* — 2005. — Vol. 26, No 4. — P. 197–198.

**Etiopathogenetical common aspects of ascaridosis and chronic pancreatitis:
optimization of treatment in the family doctor practice**

L. S. Babinets, Y. V. Dronyak

Ternopil State Medical University n. a. I. Y. Gorbachevsky, Ukraine

Key words: chronic pancreatitis, ascaridosis, trophological status, optimization of treatment, albendazole

Present in survey data clearly shows the relevance of consideration as an etiological factor of chronic pancreatitis — ascaridosis. Ascaridosis, present or past, influences the clinical course of chronic pancreatitis complicating it, deepens trophological disorders — weight loss, anemia, vitamin deficiencies, immunodeficiency and other symptoms that affect the patient's quality of life, which is especially important in the practice of primary care doctors — a district pediatrician, therapist and family doctor. Detection of ascaridosis will make the treatment of chronic pancreatitis more accurate, etiologically directed (it is reasonable to include a course of albendazole), and rehabilitation will be more successful.