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# BLASTOCYSTOSIS : PATHOGENESIS, CLINICAL COURSE, DIAGNOSTICS AND TREATMENT

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**Pathogenesis and pathomorphology.** It has not been specified yet. It is supposed that at the root of the pathogenesis of the disease stands a toxoallergic reaction, which brings to unspecific inflamation of the colonic mucosa. Pathogenity of B. hominis is proved experimentally on guinea-pigs, which were infected in natural way (orally) and by direct taking of the parasite into the cecum.

Endoscopic and hystologic observations on people are contradictory. Some authors describe discret superficial ulcers on the colonic mucosa with lymphoid and plasmatic infiltration in Lamina propria, and others determine slight mucous hyperemy or they do not find visible changes. The pathogenesis of the diarrhoea has not been specified too. Phillips and Zierdt presume that B. hominis excrete diarrhoic toxine.

The contemporary researches show, that B. hominis produces protease, which destroys the secretory immunoglobulins of IgA class in the GI tract, accelerating the adhesion of infectious agent to the bowel mucosa. Suppressing the secretory antibodies is favourable for the persisting of B. hominis in the human body. According to Puthia et al (2005) under the influence of the cytotoxic antibodies of the host the protosoic cells undergo apoptosis (programmed cells' death) – fenomenon, characteristic for the high eucaryotic organisms.

For the development of the Blastocystosis, a big importance has the pathogenic background of the macroorganism. It is often observed on weak people, children and adults with different chronic diseases. The virus infections have an important role, which weaken the immune system and are favorable for the development of secondary infections, including opportunistic parasitosis. For now it is considered that B. hominis is a comensalic organism, which in certain conditions in the host (compromised immunity) can be turned into pathogenic.

**Clinical course and complications.** The illness can pass by like enteritis, enterocolitis or colitis, often without symptoms. In the clinic declared blastocystosis main symptoms are: diarrhoea, discomfort and abdominal pain. Very characteristic for these patients is lack of appetite to full anorexia, nausea, vomiting subfebrile temperature, headache, stomachache, flatulency, allergic rash, anal scratch, and also decreased ability to work. On patients with severe acute forms is observed loss of the body weight and dehydratation.

The diarrhoic syndrome is developed in almost all of the patients – up to 80-95%, and the frequency of the movements is between 10-15 to 20-25 times daily. In the middle of the highest point of the sickness the movements are between 4 and 6 for 24h, and the excrements are watery admixed with mucus, and sometimes blood (often observed on mixed infections). There are described cases of severe haemorrhagic colitis with rectal bleeding. Diahorrea is sacute or chronic and the clinical course depends on the immune status of the patient. There might be cases with constipation. The diarrhoea very often passes by with normal

temperature. In immunocompetent patients diarrhoea is selflimiting in 7 to 10 days. And with immunocompromized patients diarrhoea is passing by in the period of 1 to 6 months (eg, AIDS, leucemia, diabetes etc.)

Abdominal discomfort is presented with cyclic stomachaches (60-80% of the patients) without specific localization, tormenting tenesms (30-40%), nausea, vomiting (10-25%) and meteorism.

The carrier of B. hominis without symptoms is the most often found form. It is usually observed on patients in stage of reconvalescency or on slow passing by infection on people with general immunologic hyporeaction.

On the side of the laboratory tests are determined compulsory eosinophilly, stool leucocytosis and occult bleeding. The stool leucocytosis is a signal for a tissue invasion, but it is also observed on other enteral protosoosis.

The diagosis is based on clinical and epidemiological data, instrumental and laboratory examinations. A confirming role plays the discovery of the parasite.

**Parasitologic diagnosis.** a*) Material for examination:* stool probe taken with a preserving substance, fresh stool, intestinal contents from bowel, biopsy material and serum.

*b) Methods of examination*

1. Microscopic – in the daily practice parasite is found with light microscopy on stool probes.

a) native preparation with normal saline solution. The examination is done with phase-contrastic microscope.

b) coloured preparation

The diagnosis is established if it is found a vacual form of the parasite, although in the fecal probe there can be found other forms. Trophosoit has a round form, with size between 5-20 μm, with big centralized vacuole, thin layer cytoplasm pushed to the ends and 1 to 4 nuclei, put in the wider part of the falcate form of the parasite. Usually the vacuole is optic empty, but sometimes it contains granules different in number and sizes. There are met some parasites in phase of cell-division, with a longer form, with nuclei on the contrary poles.

c) with Lugol preparation

d) with threechrom; The vacuole and cytoplasm of the parasite are coloured in green, while the nucleus and the additional inclusions are coloured in red.

e) by Romanovski – Giemsa. The cytoplasm of the parasite is coloured in blue and the nuclei in red.

f) by Heidenhain with iron haematoxillin. The nuclei and the inclusions are coloured in red and the vacuole is often grey. There are used also other couloring methods : by Gram, Zhiel-Nilsen, with acridine orange and etc.

2. Cultivation methods. Cultivation diagnostic is not recommended for routine diagnostic, because the food circles require anaerobic conditions and are too expensive to be used. It is a proper method in the cases when the microscopic diagnosis is not sure. There are known some different food circles – Diamond's, Loeffler, Pavlova and etc. It is successfully used cultivation in two-phase food circle of the white of an egg, mix of chicken's egg, human or horse serum. Incubation is in anaerobic conditions 37°C. Adding an antibiotic destroys the bacteria. The examination of the culture is made 24h after the inoculation. Circles like that are used for putting on biomaterial for making antigen for immune diagnostics. In the food circle it is often met ameba-like forms and the sizes of the parasite grow up to 50 μm

3. Immunologic: ELISA, RIF, Western blotting and etc. These methods find usage for determination of the carriers and unclear cases. On this step immunologic diagnostic does not have wide practice usage.

4. Molecular- biologic : PCR ( for identification of B. hominis)

5. Transmission electronic microscopic– in unclear cases.

Except that for determination of diagnosis are used and instrumental methods- imagine diagnostic methods: X-ray, CT, MRI, endoscopy. These methods have limited applicability and are not used for a routine diagnostic.

**Deferential diagnosis:** With giardiasis, amebiasis, cryptosporidiosis, cyclosporiosis, balantidiosis, bacterial and viral enterocolitis.

**Medical treatment:** The ability of self-limiting of the diarrhoea and self-clearing of the bowel continues making the need of therapy disputed.

For the ethiologic treatment of the admitted to hospital patients are successfully used the following preparations: Metronidazole (Trichomonacid, Flagyl) t.0,250 g, recommended dose for children 30-50 mg/kg/24h, on 3 intakes, for adults from 0,5 g to 1 g, for 10 days.

A few messages clarify that the Metronidazole powers up the phenomenon of apoptosis in blastocysts. It is also used and the Tinidazole (Fasigyn), t.0.500 g, one-time – for children oral dose is 50-75mg/kg, and for adults 2g; Jodoquinol (Yodoxin) in dose 30-40 mg/kg/24h, 3 times a day for 20 days; Paromomycin (Humatin, Gabbroral), caps. 0,250 g, susp.100 ml (250 mg/5ml). For children 30 mg/kg/24h, and for adults – 500 mg, 3-4 times a day for 10 to 14 days; Furazolidonum ( Furoxone, Nifolidon), t. 50 mg., susp., 0,33%, fl., 100g. For adults – 3-4 x 1 soup spoon on every 8 h; and for children – 6 mg/kg/24h in 3 intakes for a therapeutic course of 5 days; from 1-12 months – 1 tea spoon on every 6-8 h; 1 to 5 years' old – 2 tea spoons on every 6-8 h; over 5 years' old – 2 tea spoons on every 6 h; Trimethoprim-Sulfametoxazole (Biseptol, Trimezol) t. 0,120g, 0,480g, susp. – 240mg/5ml, amp. 480 mg. For adults and children – 20 mg/kg/24h – 4 t. a day, for 2-3 weeks;

An important role can also play the treatment with Ketokonasole etc. For people suffered from AIDS a good treatment effect is caused from Nitazoxanid (Alinia), tb., susp. (100mg/5ml), for adults 3 x 500 mg, a day, and for children – 20 mg/kg, for 5 – 20 days. Also there can be used with a good effect these combinations: Ciprofloxacin 500 mg/kg for 5 days + Metronidazol (Flagyl) 800 mg for 5 days or Diloxanide furoate 500 mg for 10 days; Doxycyclin+Pramomycin or Rifaximin + Nitazoxanid to 21 days. It is not recommended the usage of chemical drugs in symptomless patients.

Parallel to the medical treatment the symptomatic and adjuvant therapy (analgetics, spasmolytics, rehydratation, low lactose diet and etc.) is taking part.

**Prophylactics**: It is analogous to the rest of the enteral parasitosis.

*a ) Personal:* Strict care for the personal hygiene. Washing the hands before eating; compulsory washing the fruits and vegetables with clean water before eating; establishing hygienic lavatories.

*b ) Social:* Finding and treatment of the hospital cases; not letting a stool contamination of the environment; chemoprophylactics with Bisseptol for the risk groupes, registering of the founded cases with Bl. Hominis in the corresponding to Regional Inspection of Enviroment and epidemiologic investigation.

*c ) Dispensary:* Dispensary observation on the patients affected with AIDS and blastocystosis.

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