CUTANEOUS MANIFESTATIONS IN *BLASTOCYSTIS* SPP. INFECTION

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ABSTRACT

The pathogenic potential of *Blastocystis* spp. is extremely controversial. Recently, many researchers have discussed its inductive role in the etiology of various dermatological syndromes such as palmoplantar pruritus, acute, and chronic urticaria. The growing number of urticaria patients showing improvement after eradication of *Blastocystis* spp .infection, has proven its causative nature. Herein, we present a broad overview of the modern concept of the precise parasitological verification in the routine work-up of urticaria patients.

KEYWORDS:
Blastocystis spp., urticarial, gastrointestinal symptoms

EPIDEMIOLOGY

Blastocystis spp. is one of the most common parasites in the human intestinal tract. The reported prevalence in healthy asymptomatic adults ranges from 30-50% in developing countries to 1.5-10% in industrialised nations (1).

MICROBIOLOGICAL PROFILE

Alexieff et al. first described the genus Blastocyst as a distinct organism in 1911 (2). One year later, Brumpt et al. proposed the term "*Blastocystis hominis"*, which has been widely introduced in the medical literaturethereafter (3).

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Initially regarded as a commensal organism in the human gastrointestinal tract, *Blastocystis* spp. is an anaerobic protozoan, which is now considered by many authors as a potential pathogen that causes intestinal and allergic diseases. It exists in 4 different forms (cystic, vacuolar, granular and ameboid) with size varying from 5 to 40 μm. Vacuolar and cystic forms are the most frequently found in stool samples. *Blastocystis* spp. resides in the colon and cecum.

CLINICAL MANIFESTATIONS

Clinical manifestations of *Blastocystis* infection include diarrhoea, abdominal pain, fatigue, nausea, flatulence, blood and excessive mucus in stool samples (4-6). During the past few years, *Blastocystis hominis* infection has been highly suspected as a triggering factor in the pathogenesis of acute and chronic urticaria, angioedema, palmoplantar pruritus (7) and dermatitis (8).

Despite the wide distribution of urticaria and the typical clinical presentation (transient oedematous pink or red wheals of variable size and shape that are pruritic), its etiopathogenesis is often obscured. Different foods and food additives, drugs (antibiotics, nonsteroidal anti-inflammatory drugs - NSAIDs, hormones and others), insect bites, viral, bacterial or parasitic infections, IgE-mediated type I allergic reactions, contact with allergens, physical stimuli and systemic disorders are commonly implicated in causing acute and chronic urticaria (9, 10). A large number of helminthic parasites including *Ascaris, Strongyloides, Filaria, Echinococcus, Schistosoma* and *Trichinella* have also been associated with allergic cutaneous symptoms (11).

Recent studies have suggested a high prevalence of *Toxocara canis*, *Giardia lamblia, Fasciola hepatica* and *Blastocystishominis* infection in patients with urticaria. Kantardjiev et al. analysed a series of 6 patients with urticaria, determined to be infected with amoeboid *Blastocystis* spp. and completely cured upon etiological therapy (12).

In one study (13) data of 80 patients with confirmed positive *Blastocystis* spp. infections were assessed retrospectively, revealing that 73.75% had gastrointestinal symptoms such as abdominal pain, blood and mucus in stool samples, meteorism, weight loss, perianal itching

and vomiting. 11.25% of the patients presented with skin symptoms – urticarial and dermatitis-like lesions, which resolved after specific antiprotozoal treatment. Elevated C-reactive protein and leukocytosis were observed in all patients with skin manifestations, however, no peripheral eosinophilia was identified. The authors concluded that eosinophilia is not an obligatory laboratory finding in *Blastocystis* spp. infection, with or without skin manifestations (13).

PATHOGENESIS

The pathogenic mechanism of *Blastocystis* spp.-associated urticaria remains to be determined. A variety of immuno-reactive cells populate the gastrointestinal tract, among which T- and B lymphocytes, dendritic cells, granulocytes and tissue macrophages take the main role. Chronic protozoan inoculation can serve as a constant recruitment stimulus for accumulation of other immunocompetent cells. The newly-formed functional network of neutrophils, eosinophils and lymphocytes enhance the release of histamine through cell degranulation. *Blastocystis* spp. could also activate the complement pathway with the release of C3a and C5a anaphylotoxins, which interact with specific receptors on mast cells and basophils, causing histamine release and related skin problems (14).

Some authors suggested that a co-factor induction upon *Blastocystis* infection, for example a concomitant intake of NSAIDs, might trigger mast cell degradation and profound anaphylactic reaction (15). Other hypothesis suggests that Th-2 immune response activation is needed to mediate an increase in IgE antibody synthesis (16, 17).

Recently, it was proven that only the amoeboid form of *Blastocystis* spp.expresses pathogenic potential by adhering to the gut epithelial cells lining to enhance inflammatory cells recruitment (12, 16). More than 95% of urticarial patientsshowed amoeboid form of the microorganism, which undoubtedly confirm their greater virulence (12, 18).

CONCLUSIONS

The etiological role of *Blastocystis* spp. in acute and chronic urticaria has long been controversial, but in the recent years it has been far more widely accepted. A growing number of papers emphasise the importance of performing stool microscopy and culture in patients with urticaria of unknown etiology and minor gastrointestinal symptoms when other common causative factors have been ruled out. Largepopulation studies might provide detailed evidence of the amoeboid *Blastocystis* spp.pathogenic potential as a causative factor inurticaria, thus opening new therapeutic horizons to anti-parasite medications.

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