

Identification of *Candida* and *Geotrichum* fungi colonized in the gastro-intestinal tract of patients with chronic urticarial

Abstract

Introduction: Urticaria is a reaction pattern that represents cutaneous mast cell degranulation, with the condition being defined as chronic if lesions recur for longer than 6 weeks.

Aims and Objectives: Considering the high incidence of chronic urticaria among the patients with colonization of yeasts in gastro-intestinal tract, we investigated all fungal colonization and invasion in the gastro-intestinal tract of cases involved hives. Our aim was identification of all isolates in the level of species.

Methods: Our subjects included 200 cases with long time superficial lesions as Urticaria. Fresh stool sample from the cases with clinical symptoms were collected. A direct microscopic investigation performed for the detection of fungal growth in gastro-intestinal tract. The basic culture on sabouraud glucose agar used for confirming of the fungal detection. The Molecular methods and proteomic based MALDI-TOF system used for the identification of all fungal isolates.

Results: The highest age range of our cases was 40-50 and included 25% of all. Women and men similarly involved (12 cases each). Our findings of microscopic investigation included budding cells in 13(54.2%) cases, blastospores 6(25%), arthrospores 3(12.5%) and pseudohypha 2(8.3%). Total of 24 fungal isolates, 7 (29.2%) cases of *Geotrichum silvicola*, 7 (29.2%) *Candida albicans* and 6(25%) *Candida glabrata* were the most frequent identified by MALDI-TOF system. Other yeast included *C. Africana*, *C. tropicalis* and *C. glabrata* one each. Only one unknown case by MALDI-TOF system recorded.

Conclusion: A variable species of yeast fungi which are commensally live in human gastro-intestinal tract are potentially candidate of causing agent for chronic urticaria.

Keywords: chronic hives, candida, Yeasts, molecular typing

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Introduction

Urticaria as known as hives in popular terms is an erythematous-papular lesions, similar to the insect bites. Urticaria appears anywhere on the body or face and is characterized by intense to mild itching along with the erythema usually appears and disappears. In most cases of urticaria, finding the causing agent is difficult. In acute cases, it could be foods or medications used. However, chronic urticaria is more mysterious; some latest researches indicated a mild type of auto immune diseases.¹ Some others, reported environment allergens or infections as the agents.²

Dr. Mitchel from Mitchel medical group, NYC, showed the hives could be due to *Candida* other yeasts encountered and over grown at digestive tract.³ In some studies, infections by bacteria⁴ and human Parvovirus⁵ associated with urticaria. Among the *Candida* yeasts, hypersensitivity to *C. albicans* colonization was studied and increasing rate of IgE investigated.⁶ Another study rejected the role of saprophytic molds in urticarial.⁷

Regarding to the considerable cases of urticaria with the overgrowth of yeasts in gastro-intestinal tract, we aimed to investigate the yeast colonization or invasion in cases with the symptoms of urticaria and to identify the *Candida* and *Geotrichum* agents at the level of species.

Methods

Subjects: Two hundred patients with chronic urticaria were studied during 24 months, from April 2014 to September 2016. The clinical cases were diagnosed and confirmed by two clinicians (MD. Immunologist). Rectal swabs and stool samples were collected from the cases and moved to the Medical Mycology Center, UMS University, Urmia, Iran, for laboratory diagnosis.

Direct examination: A small amount of the specimens was processed in 0.1 ml of distilled water or potassium hydroxide and made wet smears. Microscopic investigation for yeast overgrowth or colonization (detection of cluster blastospores and pseudohypha) was performed.

Culture and identification: The primary cultures were conducted by inoculating a tip of the stool samples onto the free antibiotic sabouraud glucose agar and SGA with 0.05% chloramphenicol and 0.5% cyclohexamide, with incubation at 30 °C for 48 hours. The fungal colonies were identified and sub-cultured onto the differential medium, CHROM agar *Candida*, for the identification of probable *Candida* and *Geotrichum* species. By this method, some medically important *Candida* species such as *C. albicans*, *C. tropicalis*, *C. dubliniensis* and *C. krusei* could be identified.

Molecular identification: The proteomic based system of MALDI-TOF was used for covering the other *Candida* species and non

Candida yeasts. The data of conventional and molecular identification methods compared. Commonly found yeasts with CHA *Candida* and MALDI-TOF were reported but for the cases with different results, preferential diagnosis was based on MALDI-TOF.

Results

Total of the 200 studied cases of chronic urticaria, 24 (12%) yeast colonization were detected by the microscopic examination. The most common age range among patients with the yeast overgrowth in GI tract was 40-50 with the frequency of 25%. Distribution of the cases was equal between women and men, 12(50%) each. None of the studied cases had a history of immune suppression, corticosteroid therapy, use of broad spectrum antibiotics and other underlying factors. Also there was not any gastro-intestinal disorder as well.

Our findings of microscopic investigation included budding cells in 13(54.2%) cases, blastospores 6(25%), arthrospores 3(12.5%) and pseudohypha 2(8.3%). The findings of microscopic detection were completely in coincidence to those of cultures on SGA. The identification by differential CHROM agar *Candida* resulted *C. albicans*, *C. krusei* and *C. glabrata*. No cases of non *Candida* yeasts identified by this method. The data of MALDI-TOF system but were different. Some isolated yeasts were identified different including *Geotrichum silvicola* and *Candida africana*. Total of 24 fungal isolates, 7 (29.2%) cases of *G. silvicola*, 7 (29.2%) *C. albicans* and 6(25%) *C. glabrata* were the most frequent identified by MALDI-TOF system. Other yeasts included *C. Africana*, *C. tropicalis* and *C. glabrata* one each. Only one unknown case by MALDI-TOF system recorded.

Discussion

Urticaria is a multifactorial disease representing the mast cell degranulation, with the chronic lesions during more than six weeks. The possible role of fungi such as *Candida* species was investigated by Dr. Mitchell from the Mitchell medical group, NYC.³ Calgin reported increased frequency of chronic urticaria in women with vulvovaginal candidiasis, oral candidiasis and gastro-intestinal *Candida* colonization.⁸ A treatment with Nystatin to improve the *Candida* infections was useful. In the present study, all cases with definite overgrowth of *Candida* and *Geotrichum* yeasts in GI tract treated by Nystatin.

In a Spanish study, one hundred female patients with urticaria at an allergy and immunology center were investigated for *C. albicans*, *S. cerevisiae* and other environmental allergens, resulted 35-60% positive for hypersensitivity reactions. All cases received Nystatin therapy.⁷ Another study by Staubakh et al, investigated the role of *C. albicans* in chronic spontaneous urticaria but didn't confirmed other fungi.⁹ Our study cases with chronic urticaria exhibited increased

level of serum IgE according to the medical report by the clinic of Allergy and Immunology (SINA center, Urmia, Iran), and treated with oral Nystatin. As our findings of laboratory examination, *Candida* and *Geotrichum* species were isolated from the urticaria cases, although the isolated fungi were not proven but probable causes of urticaria in the studied patients. Some other studies reported urticaria cases associated with dermatophyte fungi,¹⁰ and *Saccharomyces*.⁷ Also, Wedi and et al studied the role of *Helicobacter pylori* in chronic urticarial.¹¹ There are no study reported *Geotrichum* species associated with urticaria.

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None

Conflicts of Interests

Author declares that there is no conflict of interest.

References

1. Moneret-Vautrin DA. Allergic and pseudo-allergic reactions to foods in chronic urticaria. *Ann Dermatol Venerol*. 2003;PMID: 12843808, French.
2. Wedi B, Raap U, Weiczorek D, et al. Urticaria and Infections. *Curr Opin Allergy Clin Immunol*. 2004;4(5):387-396.
3. Mitchell D. Chronic hives and symptoms, 2019.
4. Wedi B, Raap U, Weiczorek D, et al. Urticaria and Infections. *Allergy Asthma Clin Immunol*. 2009;5(1):10.
5. Yamazaki A, Matseo S, Munetsoga T, et al. Acute infectious urticaria associated with human parvovirus-B19 infection. *Immunol and Allergy*. 2018;1(3):119-120.
6. Staubuch P, Venend A, Burow G, et al. Patients with chronic urticaria exhibit increased rates of sensitization to *Candida albicans*. *Mycoses*. 2009; 52(4):334-338.
7. Bernstein JA and Seidu L. Chronic vulvovaginal *Candida* hypersensitivity: An underrecognized and undertreated disorder by allergists. *Allergy Rhinol (Providence)*. 2015;6(1):44-49.
8. Serrano H. Hypersensitivity to *Candida albicans* and other fungi in patients with chronic urticaria. *Allergol Immunopathol*. 1975; 3(5):289-298.
9. Mendez J, Sanchez A, Martinez JC. Urticaria associated with dermatophytosis. *Allergol immunopathol*. 2002;30(6):344-345.
10. Nittner-Marszalska M, Wojcicka I, Bogocka E, et al. Skin test response to enzyme enolase of the baker's yeast (*Saccharomyces cerevisia*) in diagnosis of respiratory allergy. *Med Sci Monit*. 2001;7(1):121-124.
11. Bilbao A, Garcia JM, Pocheville I, et al. Urticaria in relation to infections. *Allergol Immunopathol*. 1999;27(2):73-85.