Blastocystis hominis and allergic skin diseases; a single centre experience

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Abstract

Introduction: *Blastocystis hominis* in stool samples of individuals with allergic cutaneous symptoms were evaluated to study a possible link between them.

Methods: The study was done from June 2010 to December 2011, in dermatology and parasitology department of central laboratory, Alnoor Specialist Hospital, Ministry of Health, Makkah, Saudi Arabia. A total of 218 stool sample for patients who attended dermatology clinic and diagnosed as chronic urticaria, atopic dermatitis, or pruritus of unknown origin were included in the study. Standard laboratory tests for the detection of allergic etiology were performed for all patients. Detection of *Blastocystis hominis* has been made by microscopic examination of stool samples by direct examination and concentration technique.

Results: Overall, 30(13.7%) stool samples were infected by *Blastocystis hominis* with age group (26-35) and male predominace 15(6.9%) and 18(8.2%), respectively. No other allergic cause of urticaria was discovered.

Conclusion: *Blastocystis hominis* could be the etiology of chronic urticaria.

Keywords: Blastocystis hominis, urticaria, parasitology

Introduction

Blastocystis hominis (*B. hominis*) is an enteric parasite which has long been considered as an innocuous commensal living in the intestinal tract and is still the subject of controversy regarding its pathogenicity and possibly opportunistic character (1,2). Urticaria is a common and frequently debilitating disease (3). Etiologic grounds of acute urticaria are generally identified, but remained unknown in most of the chronic cases. The studies on the roles of parasitic infections in the etiology of urticaria have indicated that the most responsible protozoa are *Giardia intestinalis* and *B. hominis* (4). The presence of urticaria associated with *B. hominis* infection has been described in very few studies (5). Extra-intestinal manifestations of *B. hominis* infection have rarely been reported and include skin disorders such as palmoplantar or diffuse pruritus and chronic urticaria (6-9). A large number of parasites have been correlated with urticaria but few data exist as regards *B. hominis* infection. Considering that *B. hominis* is a modest pathogen for humans, the mechanism is probably the typical one of cutaneous allergic hypersensitivity; antigen parasites induce the activation of specific clones of Th2 lymphocytes, the release of related cytokines and the consequent IgE production (10). Our study revealed the presence of *B. hominis* infection in patients of chronic urticaria.

Methods

The study was done from June 2010 to December 2011, with the collaboration of dermatology department and parasitology department of central laboratory, Alnoor Specialist Hospital, Ministry of Health, Makkah, Saudi Arabia. This hospital is a 550-bedded referral teaching hospital delivering tertiary care throughout the Makkah region of Saudi Arabia. During the study period the patients with age of (5-65 years) diagnosed as chronic urticaria, pruritis of unknown origin, and atopic dermatitis

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by dermatology department were included in the study. In addition to other laboratory investigations, stool specimens from each subject was collected in a clean stool cup by medical laboratory technicians and transported into laboratory. All stool examinations were performed by direct method and concentrated Techniques. Direct method was performed in the same way as described earlier (11,12). With the concentration technique using fecal parasite concentrator (FPC), three spoons of stool was added to 9 ml of 10% Formalin provided at the flat-bottom tube. The specimens were mixed thoroughly and allow 30 minutes for fixation. Three drops of Triton were added to the mixed specimen followed by 3 ml of ethyl acetate. The FPC strainer was tightly attached to the flat-bottomed tube containing the fecal specimen and shaken vigorously for 30 seconds. Pointing the conical end downward; the specimen was shaken through the strainer into a 15 ml centrifuge tube. The FPC strainer was then unscrewed with the flat-bottomed tube still attached. The transport tube and strainer were discarded in an appropriate manner in biohazard bags. The 15 ml tube was capped and centrifuged at 500 x g for 10 minutes. After centrifugation, the specimen was clearly separated into four layers. The debris layer was rimmed using an applicator stick and the debris and supernatant fluid were poured out. With the tube still inverted, a cotton-tipped applicator stick was used to clean and remove the remaining debris and ethyl acetate, and the tube was returned to an upright position and two to three drops of 5% or 10% formalin, saline were added and the sediment was mixed thoroughly. The slides were prepared with a transfer pipet, cover slip, and were examined using low (x10) and high (x40) power microscope (13). The study protocol was approved by our institutional review board. Descriptive analysis was done by using Microsoft excel version 7 on personal computer.

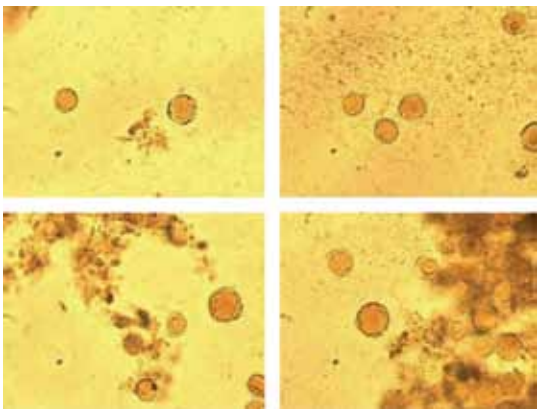

FIGURE 1. Blastocystis hominins Cyst-like in a wet mount stained in Iodine (vacular form) 40x

Results

A total of 218 stool samples for patients diagnosed as chronic urticaria were subjected to direct and concentration methods and only 30 (13.7%) were found to be infected by *B. hominis* with male predominance 18 (8.2%). More frequent age group was 25-35 years, 15(6.9%). Laboratory investigations failed to disclose any systemic diseases, including malabsorption, endocrinological, autoimmune and rheumatological disorders. Full blood count, including eosinophil count, erythrocyte sedimentation rate, C-reactive protein, cryoglobulins, circulating immune complexes, C3, C4, C1-INH, IgE and other immunoglobulins were all within the normal range. One stool sample of male patient aged 47 years old has long history of chronic urticaria showed positive results for three types of parasites, i.e., *B. hominis*, *Entameoba histolytica* and *Giardia lamblia.*

TABLE 1. Demographical distribution of *Blastocystis hominins* infection among allergic skin diseased patients

Variables		Total cases N=218	Infected cases n=30
		N	n(%)
Gender	Male	115	18(8.2)
	Female	103	12(5.5)
Age groups in years	5-15	16	3(1.4)
	16-25	45	4(1.8)
	26-35	75	15(6.9)
	36-45	73	6(2.8)
	>45	9	2(0.9)

Discussion

In our results we found 13.7% infected cases by *B. hominis* which was agreed with other studies in the perspective that *B. hominis* has some link with urticaria (2,5,6,10,14). A study from Switzerland

found parasites in stool in 35% of 46 patients with chronic urticaria, most of them with *B. hominis* (15). In one study 29.1% of the patients were found to have protozoan (*B. hominis* & *G. intestinalis*) infections (16). Extra-intestinal manifestations of *B. hominis* infection have rarely been reported and included skin disorders such as palmoplantar or diffuse pruritus and chronic urticaria (6, 7, 8, 9). In Taiwan, the association of clinical symptoms and *B. hominis* could not be delineated from study, even in immunocompromised patients. All of the patients improved without receiving any specific therapy (17). In contrast to our study, in Australia no correlation was found between clinical symptoms and *B. hominis* (18). In Japan and Canada, *B. hominis* positive individuals had no reported symptoms with *B. hominis* that proved no correlation (19, 20). Thus, *B. hominis*, though commonly seen in stool samples submitted to this laboratory, is thought to be a commensal organism. Thirty stool samples became positive after using both methods in our study, i.e., 28(93.6%) cases by direct method and 2 (6.7%) by concentration method. Our results agreed with a number of reports indicated that the formol ethyl acetate concentration technique (FECT) have poor sensitivity than Lugols iodine staining for protozoal detection so it should be discouraged (21-23). Acute urticaria of unknown etiology and chronic idiopathic urticaria patients who are resistant to the ordinary regimen of urticaria treatment might be examined for infection with *B. hominis*, in order to prescribe the proper specific anti-protozoan treatment (24).

Conclusion

Protozoan should be considered in the etiology of chronic urticaria and stool examination should be done in these patients routinely especially by direct method.

Competing interests

We declare that we have no financial or personal relationship(s) which may have inappropriately influenced us in writing this paper.

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