ASTIM ALLERJi iMMÜNOLOJi
ASTHMA ALLERGY IMMUNOLOGY

Asthma Allergy Immunol 2011;9:15-19

ARAŞTIRMA RESEARCH ARTICLE

Etiological evaluation of acute urticaria in children admitted to an inner city hospital of Turkey

Türkiye'de bir şehir hastanesine başvuran akut ürtikerli çocuklarda etyolojik değerlendirme

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ABSTRACT

Objective: Acute urticaria is one of most common allergic skin diseases in children like all age groups. But the etiological factors may vary from society to society and can't be determined in all cases. In this study, we wanted to investigate the factors that may play a role in the etiology acute urticaria in children admitted to the emergency department of an inner city hospital.

Materials and Methods: The study consisted of children with acute urticaria who had admitted to the pediatric emergency department of Sisli Etfal Training and Research Hospital. In addition to a detailed history, the patients were thoroughly examined; some biochemical tests, radiological investigations and skin prick test with some common allergens were made.

Results: The study comprised 46 (26 boys) children with a mean age of 5.9 years. Forty (86.9%) of patients with urticaria had at least one etiological factor and 21 (45.6%) cases had more than one etiological factor. Allergy to environmental allergens (39%) and infections (19.5%) were found to be the leading etiological factors in children with acute urticaria.

ÖZET

Giriş: Akut ürtiker, tüm yaş gruplarında olduğu gibi çocuklarda da sık rastlanan allerjik deri hastalıklarından biridir. Ancak etyolojik faktörler toplumdan topluma değişebilir ve her zaman tespit edilemez. Bu çalışmada büyük bir şehir hastanesinin çocuk acil polikliniğine akut ürtiker sebebiyle başvuran çocuklarda etyolojide rol oynayan faktörlerin araştırılması amaçlanmıştır.

Gereç ve Yöntem: Çalışmaya Şişli Etfal Eğitim ve Araştırma Hastanesi çocuk acil polikliniğine akut ürtiker sebebiyle başvuran çocuklar alınmıştır. Bütün hastalarda ayrıntılı bir öykünün yanında, tam bir fizik muayene, bazı biyokimyasal testler, radyolojik incelemeler ve yaygın allerjenlerle prik deri testleri yapılmıştır.

Bulgular: Çalışmaya yaş ortalaması 5.9 yıl olan 46 çocuk (26'sı erkek) alınmıştır. Hastaların 40 (%86.9)'ında en az bir etyolojik faktör, 21 (%45.6)'inde ise birden fazla etyolojik faktör bulunmuştur. Çevresel allerjenlere duyarlılık (%39) ve infeksiyonlar (%19.5) akut ürtikerli çocuklarda önde gelen etyolojik faktörler olarak bulunmuştur.

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Conclusion: The etiology of acute urticaria may be delineated in most of children. Hypersensitivity to common allergens and infections should be kept in mind as the leading etiological factors in children with acute urticaria.

(Asthma Allergy Immunol 2011;9:15-19)

Key words: Allergy, angioedema, drug allergy, food allergy, urticaria

Received: 23/11/2010 • Accepted: 01/04/2011

Sonuç: Akut ürtikerli çocuklarda çoğu kez etyoloji aydınlatılabilir. Yaygın allerjenlere duyarlılık ve infeksiyon akut ürtikerli çocuklarda akılda tutulması gereken en önemli sebeplerdir.

(Asthma Allergy Immunol 2011;9:15-19)

Anahtar kelimeler: Allerji, anjiyoödem, besin allerjisi, ilaç allerjisi, ürtiker

Geliş Tarihi: 23/11/2010 • Kabul Ediliş Tarihi: 01/04/2011

INTRODUCTION

Acute urticaria is one of the most common allergic skin diseases in children like in all age groups, and many factors may be involved in the etiology of this problem[1-3]. Some of these are: foods, food additives, drugs, infections, respiratory allergens entering via the skin penetration or in contact with the substances, some internal diseases, psychological factors and physical agents. But these factors may change from community to community[4].

The aim of this study was to investigate the factors in the etiology of acute urticaria in children admitted to a pediatric emergency department of a large hospital in the largest metropoliten city of Turkey.

MATERIALS and METHODS

In this prospective study, subjects with acute urticaria were randomly recruited from the children admitted to the emergency department of Sisli Etfal Training and Research Hospital, Istanbul with urticaria between January 2008 and August 2008.

The patients with complaints shorter than six weeks were defined as acute urticaria[1]. A detailed history was taken from all of the patients which included any drugs taken, suspected foods, contact with known allergens, accompanying infections, insect bites and any other systemic diseases. Any physicial factors increasing the symptoms (such as cold, sun exposure, pressure) were also asked to the parents.

After detailed history and physical examination, laboratory investigations which included complete blood counting, aspartate aminotransferase (AST), alanine aminotransferase (ALT), thyroid function tests, thyroid auto-antibodies, sedimentation rate, total serum IgE level, hepatitis B surface antigen (HBsAg), anti-HBs antibody, a full urinalysis, throat culture, the parasites in the feces, peripheral blood films and sinus and lung radiographs when required. Since the study was performed in the conditions of emergency department oral challenge tests with foods couldn't have been.

In all of the patients skin prick tests were made with the following antigens after resolution of acute urticaria lesions and stopping the antihistamines: *Dermatophagoides pteronyssinus* (DP), milk, strawberry, egg, banana, cat dander, tree mixture, grass mixture and weed mixture. Skin prick tests were performed on the volar aspect of the forearm using Stallerpoint needles (Laboratorie des Stallergenes, France). Histamine phosphate (1 mg/mL) was used as the positive control and phosphate buffered saline as the negative control. The cutaneous reactions were read after 15 minutes and were evaluated according to the size of wheal and erythema. Skin prick tests were defined as positive if the mean wheal diameter was at least 3 mm larger than the negative control[5]. Further investigations (such as thyroid ultrasonography, urinary tract ultrasonography and anti-DNA) were made when required in the light of the clinical and laboratory findings. The study was approved by the hospital ethics committee.

Statistical analyses were performed with NCSS 2007 software package. The data was analyzed with descriptive statistical methods (mean, standard deviation) in addition to comparison of two groups with Student t test and chi-square test. A p value less than 0.05 was accepted statistically significant.

RESULTS

The study comprised 46 children (26 boys) aged 8 months to 14 years (mean 5.93 ± 3.88 years). Parents of 16 (34.7%) patients had a chronic allergic disease history (such as asthma, allergic rhinitis, atopic dermatitis and chronic urticaria). Angioedema was not seen in any of our patients. In 40 (86.9%) of patients with urticaria at least one etiological factor was found.

Twenty one (45.6%) of the cases had more than one etiological factor. Any infectious disease was diagnosed in 9 (19.5%) of patients. The diagnosed infections were sinusitis in three, urinary tract infection in two, pneumonia in two, balanitis in one and streptococcal pharyngitis in one patient. Four (8.7%) patients had urticaria after taking any food (fish in one child, peanut in two children and chocolate in one child) and 6 (13%) had urticaria after taking drugs (three cephalosporins and three penicillin derivatives). Two (4.3%) patients had urticaria after using any cosmetic products. Thirty four (74%) patients had no systemic disease other than urticaria but rest of the patients had any other health problem (Table 1). Laboratory investigations revealed high thyroid autoantibodies in 3 (6.5%) patients. Other abnormal laboratory test results are shown in Table 2.

Eighteen (39%) patients were found to be sensitive to one or more allergens and DP was the most frequently identified allergen (30.4%). Other skin prick test results are shown in Table 2.

Table 1. Some important characteristics and clinical findings of children with acute urticaria

Characteristic (n= 46)	
Age	8 mo-14 y (5.93 ± 3.88 year)
Female/Male	20/26
Parental allergic disease	16 (34.7%)
Described etiology	40 (86.9%)
Infectious diseases	9 (19.5%)
Foods	4 (8.7%)
Drugs	6 (13%)
Cosmetics	2 (4.3%)
High thyroid autoantibodies	3 (6.5%)
Sensitivity to any allergen	18 (39%)

DISCUSSION

Although the cumulative prevalence of urticaria is about 15-20% in general population, it isn't known exactly among children[6-8]. On the other hand, the prevalence changes from county to country, for example in the UK, 15% to 20% of college students reported having urticaria, and it was the reason for 1% to 3% patient referrals to hospital dermatologic outpatients, but it is about 8% among Swedish school children[9,10].

Table 2. Results of laboratory investigations in children with acute urticaria

	No. of cases with abnormal results
Leukocytosis	12 (26%)
Eosinophilia (≥ 450 cells/μL)	8 (17.4%)
Abnormal urinalysis	2 (4.3%)
Group A beta-hemolytic Streptococcus in throat culture	1 (2.2%)
Total serum IgE (above normal values for age)	30 (65.2%)
Giardia lamblia in stool	2 (4.3%)
Positive skin prick tests	18 (39%)
Dermatophagoides pteronyssinus (DP)	14 (30.4%)
Strawberry	2 (4.3%)
Pollens	2 (4.3%)

The most common reasons of acute urticaria in children are foods, drugs and infections[7,11]. Even if acute urticaria/angioedema may be associated with ocular, respiratory, and gastrointestinal symptoms; urticaria and other cutaneous reactions to foods represent one of the most common presentations of food allergy in children[12,13]. But, we exactly don't know the role of food additives, such as preservatives and colorants in the etiology of acute urticaria despite they may provoke or aggravate chronic urticaria[14].

Foods were the triggering factors in four of our cases with urticaria. Kauppinen et al. reported the food in 11.6% of their patients and food additives in 12.8% as the causative reason of acute urticaria[15]. On the other hand, Volonakis et al. reported foods in 4% of children and food additives in 2.6% as the responsible factors in children with chronic urticaria[16]. The double-blind, placebo controlled food challenge is the gold standard for the diagnosis of food allergies. Unfortunately, we couldn't have done this test in our patients due to lack of conditions of our hospital. This is an important limitation of our study.

Drugs were believed as the causative agent of urticaria in 13% of our patients. This higher proportion-which has been reported as 0.6% by Kauppinen and 1.8% by Volanakis may be due to the fact that-unfortunately- many drugs can be bought without prescription in our country[15,16].

Acute urticaria may often be associated with acute viral infections, and rarely acute bacterial infections in children[15,16]. When urticaria occurs during the course of an infection, it is very difficult to document the true cause of urticaria, because of association of many other related factors, such as the antibiotics used during the course of infections[17]. Infections were believed as the causative factor in about 19.5% of our patients. In some of these patients another factor was also described in the etiology of acute urticaria.

It has been shown that about 40% of adult patients with chronic urticaria have autoimmune urticaria[18]. Brunetti et al. demonstrated that children have the same ability as adults to produce functionally active autoantibodies directed against IgE or IgE-receptors in about 30% of cases with chronic urticaria[19]. But the role of autoimmune mechanisms in acute childhood urticaria has not been clearly delineated yet. We found autoimmune thyroiditis in three cases (6.5%) which has been reported as 4.3% by Levy et al. in children with chronic urticaria[20]. On the other hand, Gul et al. found no significant difference between the patients with chronic urticaria and controls in terms of thyroid hormone levels and thyroid autoantibodies[21]. Since we couldn't describe any other etiological factors, autoimmune mechanisms may be implicated as the reasons of acute urticaria in these three cases. But we need more cases to delineate the role of autoimmunity in childhood acute urticaria.

Acute urticaria caused by parasite infestations are rarely seen in developed countries[2]. However, it should be taken into consideration in endemic regions. Stool examination of our cases revealed *Giardia intestinalis* cysts in two cases in none of whom any symptoms related to gastrointestinal system were detected.

In conclusion; hypersensitivity to common allergens and infections are the leading etiological factors in children with acute urticaria in our patient population.

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