Hyperimmunoglobulin E (Job's) Syndrome and Staphylococcal Botryomycosis in a Child

Hiperimmunglobulin E Sendromu ve Stafilokokkal Botryomycosis Olan Çocuk Olgu

Ayşegül Bükülmez[1], Zeren Barış[1], Ödül Eğritaş[1], Sinan Sarı[1], Ayşe Tana Aslan[2], Pınar Uyar Göçün[3], Buket Dalgıç[1], Figen Doğu[4]

[1]Department of Pediatric Gastroenterology, Faculty of Medicine, Gazi University, Ankara, Turkey
[2]Department of Pediatric Pulmonology, Faculty of Medicine, Gazi University, Ankara, Turkey
[3]Department of Pathology, Faculty of Medicine, Gazi University, Ankara, Turkey
[4]Department of Pediatric Immunology and Allergy, Faculty of Medicine, Ankara University, Ankara, Turkey

ABSTRACT

Hyperimmunoglobulin E syndrome and botryomycosis are both uncommon disorders. This report describes the case of an 8 year old boy in whom these two disorders coexist, who presented with hypereosinophilia, and elevated immunoglobulin E and was initially diagnosed as idiopathic hypereosinophilia. He was finally diagnosed as hyperimmunoglobulin E syndrome with the development of cutaneous and visceral botryomycosis under steroid treatment. *(Gazi Med J 2011; 22: 124-6)*

Key Words: Hypereosinophilia, hyperimmunoglobulin E, botryomycosis, children

Received: 05.08.2011 **Accepted:** 12.10.2011

ÖZET

Hiperimmunglobulin E Sendromu ve botriyomikozis her ikisi de nadir görülen hastalıklardandır. Hipereozinofili ve yüksek immunoglobulin E yüksekliği ile başlangıçta idiopatik hipereozinofili tanısı almakta iken son tanısı hiperimmunglobulin E sendromu olan steroid tedavisi almakta iken kutanöz ve visseral botriyomikozis gelişmiş olan 8 yaşında bir erkek olgu bildirilmiştir. *(Gazi Med J 2011; 22: 124-6)*

Anahtar Sözcükler: Hipereozinofili, hiperimmunglobulin E, botriyomikozis, çocuk

Geliş Tarihi: 05.08.2011 **Kabul Tarihi:** 12.10.2011

INTRODUCTION

Botryomycosis or bacterial pseudomycosis is a rare chronic suppurative granulomatous lesion containing bacterial granules. It is most commonly reported in association with immunodeficiency states (1, 2). We report an eight-year-old boy who was evaluated for hypereosinophilia, initially diagnosed as primary hypereosinophilic syndrome and started on steroid therapy that led to botryomycosis caused by *Staphylococcus aureus*. With the new findings, he was diagnosed as having hyperimmunoglobulin E syndrome (HIES).

CASE REPORT

An eight-year-old boy was referred to our hospital for hepatomegaly and hypereosinophilia. His medical history included neonatal sepsis, intestinal perforation, staphylococcal abscess of the liver and recurrent urticarial lesions. In the physical examination, he had a broad nasal bridge, prominent forehead, coarse facial

Address for Correspondence/Yazışma Adresi: Ayşegül Bükülmez, MD, Department of Pediatric Gastroenterology, Faculty of Medicine, Gazi University, 06500 Beşevler, Ankara, Turkey Phone: +90 312 202 41 48 Fax: +90 312 215 01 43 E-mail: aysegulbukulmez@yahoo.com

doi:10.5152/gmj.2011.27

appearance and hepatomegaly. WBC count was 35700/mm^3 with 68% eosinophils and liver enzymes were slightly elevated. Laboratory investigations were negative for parasites. Candidin and tuberculin skin tests were negative. IgA level was 47.2 mg/dl (normal: 70-303) and IgE level was 2500IU/l (normal<15) (3). Other immunologic tests were normal. Bone marrow aspiration and intestinal mucosal biopsies did not show any pathology. Liver biopsy revealed eosinophilic infiltration, eosinophilic granulomas with giant cells and sinusoidal fibrosis (Figure 1).

After the exclusion of the secondary and clonal causes of hypereosinophilia, the differential diagnosis was made for idiopathic hypereosinophilic syndrome and HIES. Because the clinical scoring for HIES was 28 points, oral prednisolone was started with the diagnosis of hypereosinophilic syndrome (4).

Two weeks later he was admitted to our hospital with 39.5ºC fever, tachypnea, dyspnea and tender erythematous nodules, measuring 0.5×0.5 cm on the hands, feet, chest and neck. He also had a fracture without history of trauma in the right fourth metatarsal bone. Posteroanterior chest X-ray revealed a lung abscess (Figure 2). Prednisolone was discontinued and antimicrobial therapy was started. Echocardiography revealed pericardial effusion. Cytological examination of hemorrhagic pericardial fluid showed gram-positive cocci and the culture was positive for *S. aureus*. CT of the thorax and abdomen revealed lung and liver abscesses (Figure 3, 4). Skin biopsy revealed gram-positive cocci groups in the dermis. The histopathological findings consisted of "bacterial infection with Botryomycosis" in skin biopsy (Figure 5). With the new findings, he was diagnosed as HIES with a scoring of 43 points. Intravenous immunoglobulin was added to antimicrobial therapy. The clinical and radiologic findings improved by the end of 8 weeks.

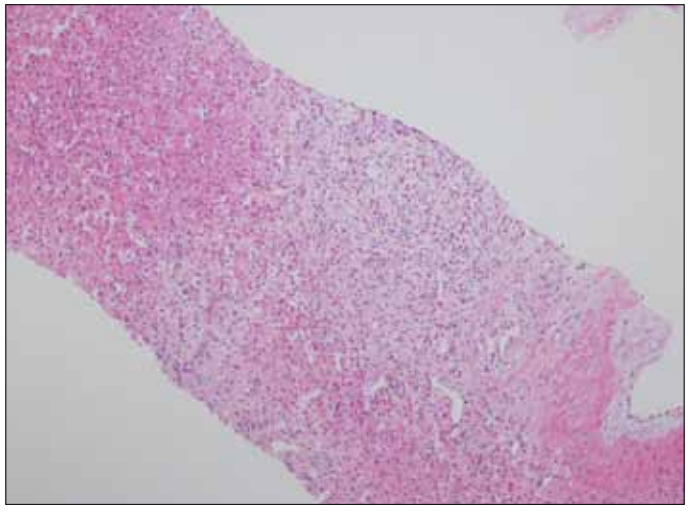

Figure 1. Granuloma formation rich in eosinophils (HE×200-2)

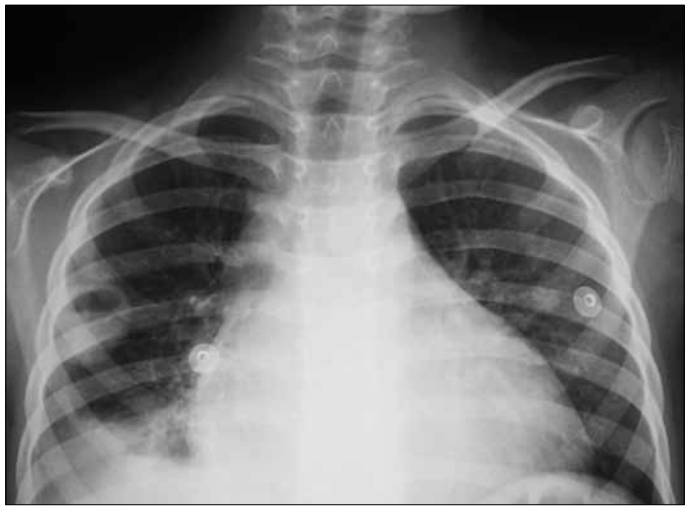

Figure 2. A cavitary lesion (2×2 cm) with an air-fluid level in chest X-ray

DISCUSSION

The most common causes of peripheral eosinophilia are parasitic infections, allergic and connective tissue disorders and solid and hematological malignancies (5). Hypereosinophilic syndromes are a heterogeneous group of disorders that were defined as persistent

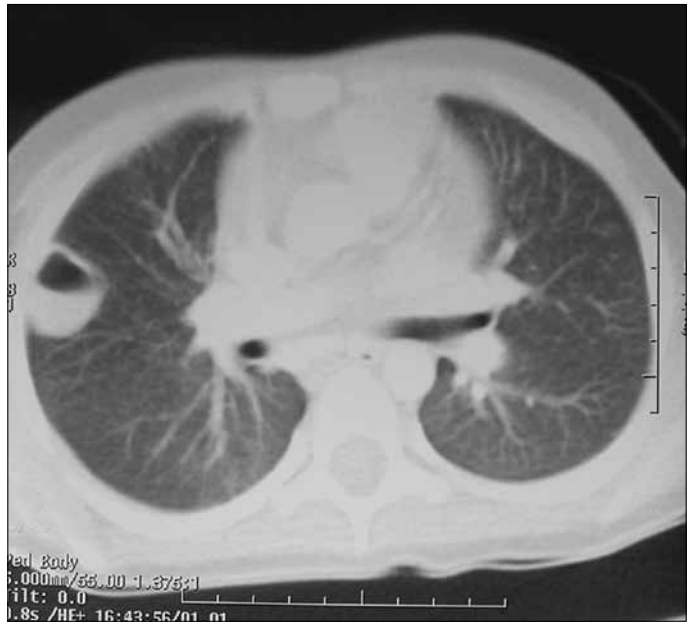

Figure 3. A cavitary lesion of 2 cm diameter in the anterior segment of the right upper lobe in computed tomography of the thorax

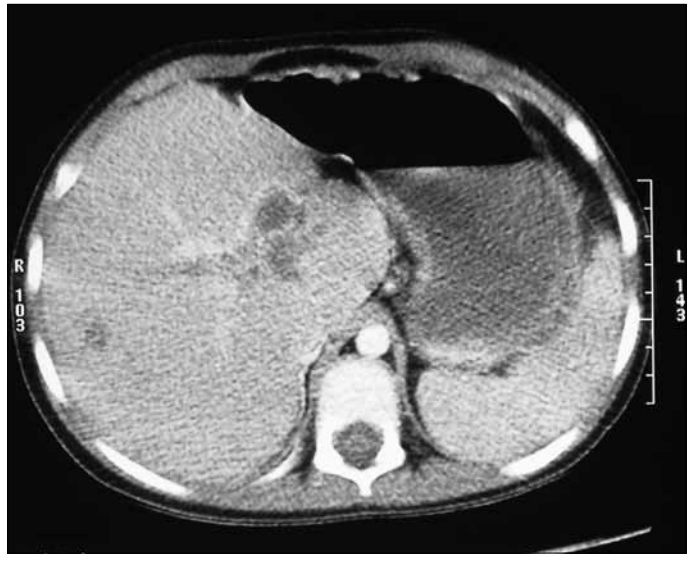

Figure 4. Multiple hypodense nodular lesions in the liver in computed tomography of the abdomen

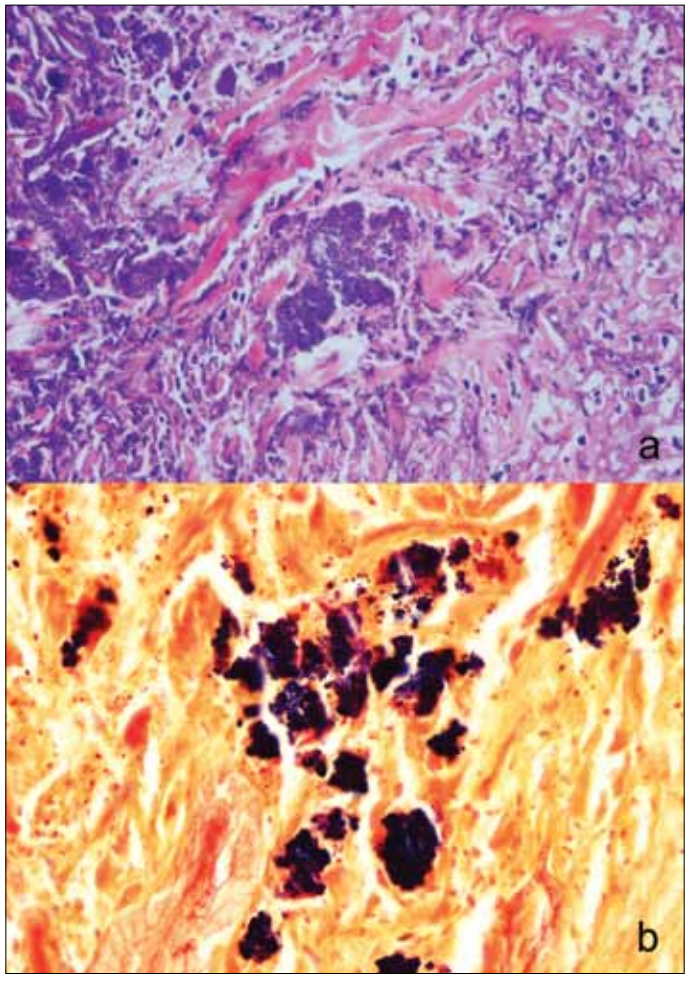

Figure 5. a) Bacterial colonies between the collagen bundles in the upper and deep dermis. They were surrounded by extensive purulent infiltrate and some degree of desmoplasia (HE×200) b) Numerous gram positive cocci were demonstrated with the Brown and Brenn stain (Brown and Brenn ×400)

eosinophilia (>1500/mm^3) for more than 6 months and eosinophil induced organ damage with the exclusion of secondary causes of hypereosinophilia (6). After the secondary causes of hypereosinophilia were excluded and eosinophilic granulomas were described in liver biopsy, our patient was initially considered as having hypereosinophilic syndrome. However, the clinical and laboratory findings at the second hospitalization led us to the diagnosis of HIES.

The criteria for diagnosis of HIES include clinical findings such as recurrent skin abscesses, pneumonia, characteristic facial appearance, rash in the newborn period, fractures with mild trauma, permanence of decidual teeth, scoliosis, hyperextensibility and laboratory features like high serum IgE levels (>2000 IU/ml) and eosinophilia (>800/mm^3) (7). The main immunologic abnormalities are neutrophil chemotactic defect and irregularity between Th1 and Th2 cells (7). The levels of IgA and IgG are typically normal in HIES, but low IgA levels were also reported rarely (7).

Botryomycosis is a chronic suppurative granulomatous disease caused by bacteria. *S. aureus* is the most common etiologic agent (1). The pathogenesis of botryomycosis has not yet been completely understood. The disequilibrium between virulence of microorganisms and host defence e leads to granuloma formation. The disease has been reported mostly in immunocompromised hosts such as HIES and cystic fibrosis in children (8, 9).

Botryomycosis has two forms: cutaneous and visceral. Skin involvement is seen in two thirds of the patients. Cutaneous lesions are usually composed of nodules, sinuses, fistulas, abscess, verrucous lesions and ulcers seen on the hands, feet, neck, head, chin, and buttocks. Visceral botryomycosis most frequently invades lungs and may also disseminate into the liver, gastrointestinal system, brain, pericardium, kidneys and lymph nodes (1, 2, 10).

In our case, staphylococcal botryomycosis developed on the basis of immunodeficiency due to HIES and steroid therapy. We report this case to emphasize the difficulties in the differential diagnosis of hypereosinophilia and to remind the reader of the coexistence of cutaneous and visceral botryomycosis with HIES.

Conflict of Interest

No conflict of interest was declared by the authors.

REFERENCES

1. Gupta K, Das A, Radotra BD, Bhalla A. Cardiac botryomycosis: an autopsy report. J Clin Pathol 2008; 61: 972-4. [CrossRef]
2. Gavin PJ, Das L, Chadwick EG, Yogev R. Botryomycosis in a child with acquired immunodeficiency syndrome. Pediatr Inf Dis J 2000; 19: 900-1. [CrossRef]
3. Tezcan İ, Berkel Aİ, Ersoy F, Sanal Ö. Türk çocukları ve erişkinlerde türbidometrik yöntemle bakılan serum immunoglobulin düzeyleri. Çocuk Sağlığı ve Hastalıkları Dergisi 1996: 39: 649-59.
4. Grimbacher B, Schäffer AA, Holland SM, Davis J, Gallin JI, Malech HL, et al. Genetic linkage of hyper-IgE syndrome to chromosome 4. Am J Hum Genet 1999; 65: 735-44. [CrossRef]
5. Brito-Babapulle F. The eosinophilias, including the idiopathic hypereosinophilic syndrome. Br J Haematol 2003; 121: 203-23. [CrossRef]
6. Sheikh J, Weller PF. Clinical overview of hypereosinophilic syndromes. Immunol Allergy Clin North Am 2007; 27: 333-55. [CrossRef]
7. Grimbacher B, Holland SM, Gallin JI, Greenberg F, Hill SC, Malech HL, et al. Hyper-IgE syndrome with recurrent infections-an autosomal dominant multisystem disorder. N Engl J Med 1999; 340: 692-702. [CrossRef]
8. Bulengo-Ransby SM, Headington JT, Cantu-Gonzalez G, Rasmussen JE. Staphylococcal botryomycosis and hyperimmunoglobulin E (Job's) syndrome in an infant. J Am Acad Dermatol 1993; 28: 109-11. [CrossRef]
9. Katznelsen D, Vawter G, Foley G, Shwachman H. Botryomycosis, a complication in cystic fibrosis. Report of 7 cases. J Pediatr 1964; 65: 525-39. [CrossRef]
10. de Vries HJ, van Noesel CJ, Hoekzema R, Hulsebosch HJ. Botryomycosis in an HIV-positive subject. J Eur Acad Dermatol Venereol 2003; 17: 87-90. [CrossRef]