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Hyperimmunoglobulin E syndrome (Job syndrome): chest CT findings

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TO THE EDITOR:

A 38-year-old male patient presented with a history of recurrent respiratory and skin infections since childhood. Fourteen years prior, he had been admitted with an acute respiratory infection, and an elevated IgE level (> 3,000 IU/mL) was observed. Hyperimmunoglobulin E syndrome (HIES) was diagnosed. Since then, the patient has been followed on an outpatient basis, with recurrent paranasal sinusitis and respiratory infections caused by *Staphylococcus aureus*, *Haemophilus influenzae*, and *Pseudomonas aeruginosa*, among others. He has undergone periodic low-dose chest CTs. The most recent CT scans demonstrated thin-walled cavities, predominating in the upper lobes, and non-homogeneous consolidations in the left lung, as well as bronchiectasis. The patient was then diagnosed with recurrent *S. aureus* pneumonia and treated with antibiotics (Figure 1).

HIES, also known as Job syndrome, is a rare multisystem immunodeficiency disease characterized by high serum IgE levels, eczema, and recurrent skin and lung infections. Dysfunction of T-helper 17 lymphocytes plays a crucial role in the immune response to infections caused by pathogens such as extracellular bacteria and fungi. A hallmark of the syndrome is an elevated serum IgE concentration, exceeding 2,000 U/mL and frequently greater than 5,000 U/mL. A value of 2,000 U/mL is considered to be the cut-off point, which has proved to be helpful in establishing a definitive diagnosis of the syndrome.[1-4]

Two distinct forms of the disorder (autosomal-dominant and autosomal-recessive) have been recognized. The autosomal-dominant form is associated with a cluster of facial, dental, skeletal, and connective tissue abnormalities, which are not seen in the recessive type.[1,5] Aside from skin lesions, the most commonly occurring complications include upper airway infection, manifested as paranasal sinusitis, exudative otitis media, otitis externa, mastoiditis, or respiratory tract infection.[1,4]

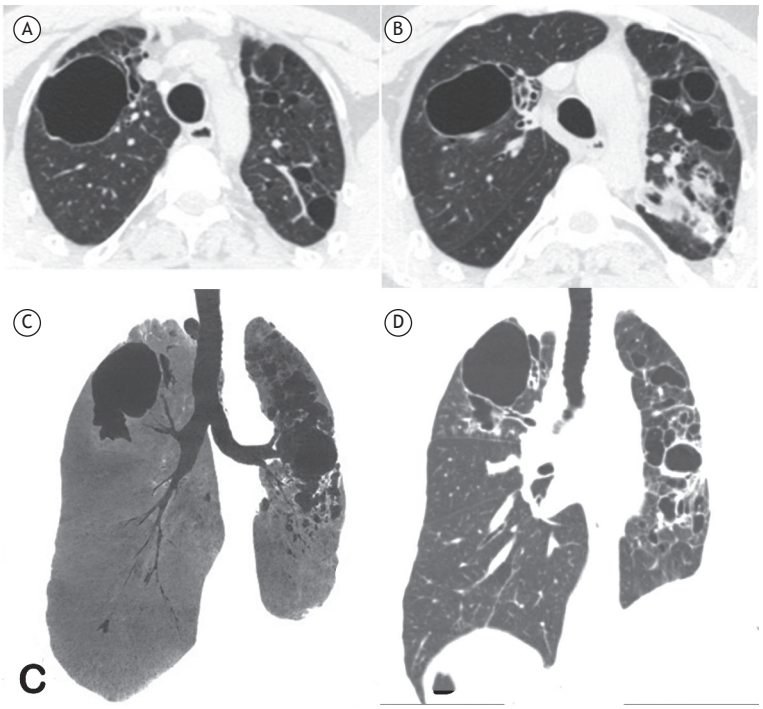

Figure 1. Axial CT scans of the upper lobes (in A and B) and a coronal reconstruction (in C) show bilateral thin-walled cavities and non-homogeneous consolidations in the left lung as well as bronchiectasis. A coronal reconstruction performed 10 months prior (in D) demonstrated similar findings.

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Severe recurrent respiratory infections are usually caused by *S. aureus*, including methicillin-resistant strains, and, less frequently, by *H. influenzae* and *Streptococcus pneumoniae*. Pneumonia is typically complicated by lung abscesses, bronchiectasis, bronchopleural fistulas, and the formation of pneumatoceles. Complications associated with pulmonary infection are among the most common causes of death in the course of HIES. In children, late diagnosis significantly worsens respiratory function and reduces the chance for normal development. The bronchopulmonary lesions are predisposing factors for colonization by opportunistic microorganisms, such as *P. aeruginosa* and *Aspergillus fumigatus*. The latter can lead not only to invasive aspergillosis, requiring intensive therapy, but also to the formation of aspergilloma. Pulmonary sequelae lead invariably to the development of chronic respiratory insufficiency and are the main cause of mortality in HIES.[1,2,4] Other complications include facial, musculoskeletal, neurological, and vascular abnormalities. In addition, the risk of development of neoplastic diseases, such as Hodgkin and non-Hodgkin lymphomas, as well as acute myeloid leukemia, should not be overlooked in patients with HIES.[4,5]

The main goals of HIES management are aggressive treatment of infections and good skin care. A further point of note is that aberrant tissue healing following pulmonary infection can result in parenchymal abnormalities that allow bacterial and fungal colonization leading to infection. Pulmonary surgery appears to be associated with a greater risk of complications and should be considered carefully and undertaken only in a center with specific experience with the disease.[5]

In conclusion, HIES, a multisystem disorder with a diverse somatic picture and a variable clinical course depending on the variant of the disease, poses a great challenge for clinicians in terms of establishing a diagnosis in suspected cases. The introduction of comprehensive management, including prophylactic treatment, can reduce the frequency of recurrence. Patients with HIES require management with an interdisciplinary approach to prevent irreversible and life-threatening pulmonary complications.

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