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Dermatologic Manifestations and Pulmonary Involvement in Two Patients with Hypereosinophilic Syndrome - A Case Series

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Abstract Hypereosinophilic syndrome is a group of disorders described by excessive production of eosinophils, their infiltration and the release of mediators that cause damage to multiple organs. Two patients of 67 and 38 years old, were referred to the clinic of Hematology and Oncology, Kermanshah, Iran, in 2016 and 2017, respectively. In the first case, there was no suspicious item in the patient's medical records and his most prominent features were pulmonary emphysema, and hypopigmented lesions, while in the second case, in addition to having a history of asthma, lesions of eczema were also seen. Hence, according to these characteristics and the results of the tests performed, our differential diagnosis was the Hypereosinophilic syndrome. We started the treatment with two types of drugs, Imatinib and Prednisolone. The treatment of patients is still ongoing and their condition was relatively promising.

Keywords: *hypereosinophilic syndrome, pulmonary emphysema, eczema, imatinib*

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1. Introduction

Hypereosinophilic syndrome (HES) is belongs to a diverse group of disorders which are represented by high production of eosinophil cells [1]. This great group of diseases was classified in 2011 [2]. According to this classification, HES variants include the following: Hereditary HE, primary HE, secondary HE, and HE of undetermined significance /idiopathic (iHES) [3]. These disorders, due to their heterogeneity, involve different organs, including the pulmonary, skin, cardiovascular system, gastrointestinal system, and central nervous system [4,5]. In more than 40% of cases, pulmonary involvement is seen, and the most common clinical symptom is a constant coughing [6]. To diagnosis of this syndrome, should be considered the following three criteria [7,8]:

a. Eosinophil count is more than 1.5 x 10^9/L for 6 months or more (normal eosinophil count is 0.5-1. x 10^9/L).

b. Indications of organ involvement of such as the heart, lungs, etc.

c. Its distinction of other causes of increased eosinophil.

We have introduced two patients with HES who each have unique features, and after diagnosing the disorder, we started treating him.

2. Case Presentation 1

In January 2016, a 67-year old man who was admitted to the clinic of Hematology and Oncology in Kermanshah, Iran, had no specific medical history. The patient has clinical symptoms, including fever, cough, dyspnea and hypopigmented lesions were seen on the surface of the skin (Figure 1).

Peripheral blood smears showed a markedly elevated eosinophil count and complete blood count (CBC) results revealed white blood cells (WBC) 21.000/mm3, hemoglobin (Hb) 9.7 g/dl, and platelet (Plt) 434.000/mm3. When he was examined by pulmonologist, the Chest radiograph demonstrated pulmonary emphysema, that it was identified by bronchial mucosal biopsy because of infiltration of eosinophils into the pulmonary tissue (Figure 2).

Then, the bone marrow biopsy detected about 5% of the eosinophilic precursor cells. Also expression of the CD117 cell marker was negative by using the

Immunohistochemistry (IHC) staining method, which differentiated from Systemic Mastocytosis Syndrome with Eosinophilia. However, presenting the patient's peripheral blood eosinophilia lasting longer than 6 months, the organ involvement and differentiate from other reasons of eosinophilia, our diagnosis was hypereosinophilic syndrome (HES). Therefore, we started the first line of treatment with the Imatinib (100 mg/d) for two months, then in the second line of treatment, in addition to Imatinib, the prednisolone (7.5 mg/d) was used. These are used to reduce the number of eosinophil cells in the blood and control the growth of malignant cells, respectively. This course lasted 7 months that results the CBC is as follows:

-WBC: 10.800/mm^3

-Hb: 10 g/dl

-Plt: 334000/mm^3

At the end of two courses, the results of CBC demonstrated a relatively good clinical condition and the patient was still under follow-up.

Figure 1. Hypopigmented lesions on the surface of skin

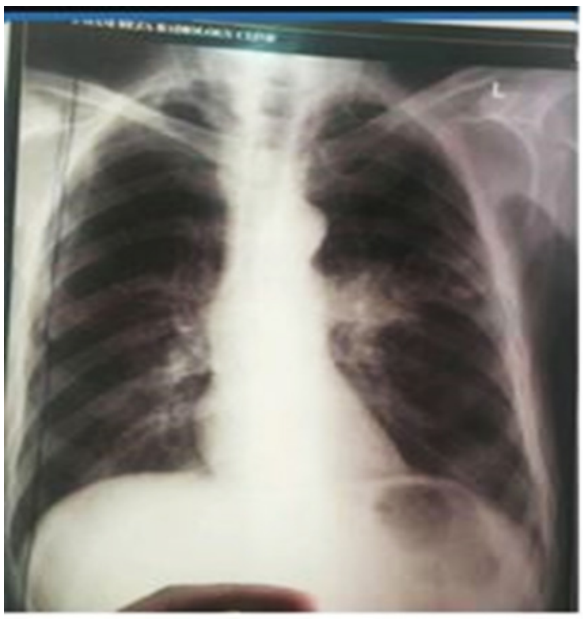

Figure 2. Chest Radiograph with pulmonary emphysema

3. Case Presentation 2

Our case was a 38-year-old man who referred to the clinic, with symptoms such as sensitivity to itching, dyspnea, and frequent coughing, in October 2017. Also, in a review of his medical history, it was found that he had bronchial asthma. In his clinical examination, multiple eczema lesions were observed on the skin of his head which is clearly seen in Figure 3. Therefore, the physician asked for blood tests. His WBC count was 11,000/µL and peripheral blood smear showed 70% of eosinophilia in the blood (Figure 4). Then, radiography and CT scan of the chest were performed to examine the status of the lungs, which the results showed pulmonary bronchitis especially in the left lung and presence of scattered nodules with a ground glass view along with multiple masses with different sizes in the apex of both lungs as shown in Figure 5. However, the result of a CT scan of his abdomen and pelvis was normal.

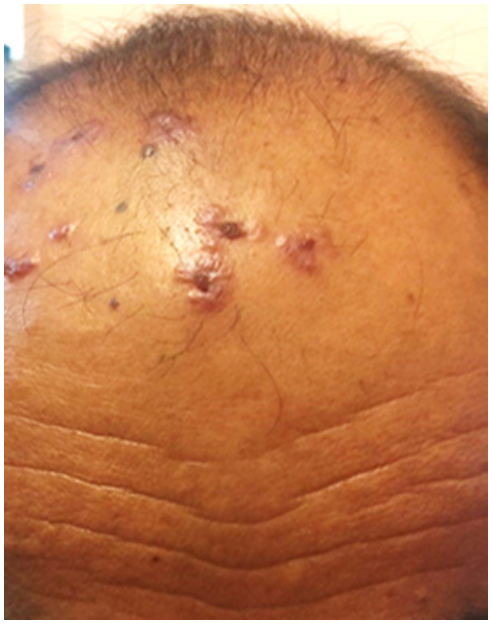

Figure 3. Multiple eczema lesions on the skin of head

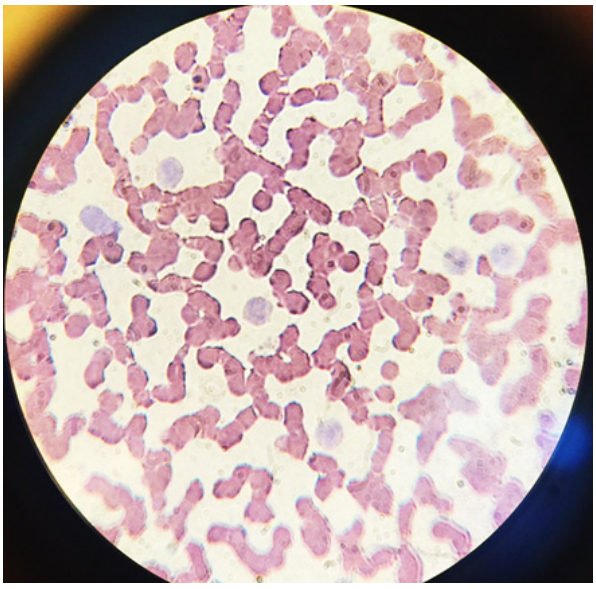

Figure 4. Peripheral blood smear

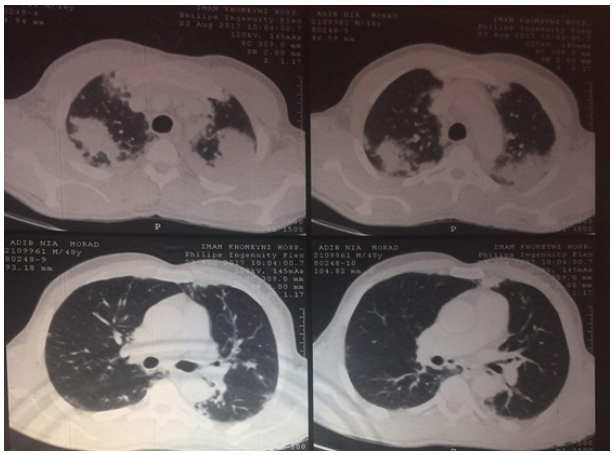

Figure 5. Pulmonary bronchitis and scattered nodules with a ground glass view

Also, By examining the pathology of bronchial mucosa, eosinophilia infiltration was detected. Based on these findings, which included organs involvement and eosinophilia more than 70% in the blood, the final diagnosis of his disease was HES. Following this diagnosis, we started treatment with prednisolone and imatinib. Despite the relatively favorable condition, the patient is still under treatment.

4. Discussion

Initially, HES, a prolonged eosinophilia of unidentified cause, was described by Hardy and Anderson in 1968 and today, it is known as the idiopathic HES (iHES) [9]. Although the true prevalence of the syndrome is unknown, approximately, HE-incidence could be estimated between 0.36 and 6.3 per 100000 and all-inclusive evaluations demonstrate that more than 50% of patients are in the group (iHES) [10,11]. The maximum age of the diagnosis is 20-50 years and and is seen mainly in men, but the severity of this syndrome is equal between the sexes [12]. The HES is considered as a systemic disease which could be deadly via eosinophilic infiltration into vital organs such as heart and lungs [13]. Pulmonary involvement can occur for two causes: primary involvement may derive from eosinophilia infiltration of the lungs and secondary involvement result from heart failure in pumping function (known as congestive heart failure) and emboli due to deep vein thrombosis or a right ventricular mass [6,14].

Investigatins were demonstrated that pulmonary involvement, one of the principal cause of death of hypereosinophilic syndrome, can exist in more than 40% of cases [6]. This sympom was seen in both of our cases, So that in cases 1 and 2 was confirmed the presence of pulmonary emphysema and pulmonary bronchitis with scattered nodes, respectively. Also, Skin is the essential tissue who is involved in HES. Skin lesions could occur in over 50% HES-positive cases that the erythematous pruritic papules, nodules, Angio-edematous and Mucosal urticaria is most common skin complications [15]. In case 1, unlike the reported cases, the hypopigmented lesions on the skin of the hand differentiated him, however, the unique feature of case 2 was multiple eczema lesions on the skin of head.The exact cause has not yet been reported, but it is likely to be associated with increased cytolysis of eosinophils and their degranulation effects in the skin [16].

However, the main cause of eosinophilia in HES remains unknown, recently, FIP1L1/PDGFRA (Fip1-like1/platelet-derived growth factor receptor alpha) fusion existence has been approved in this syndrome [9,17]. Regarding HES poor prognosis, FIP1L1/PDGFRA mutation, as a tyrosine kinase, could be targeted via tyrosine kinase inhibitors (Imatinib) and improve HES patient's treatment [18,19]. Typically, corticosteroids such as prednisone are utilized for HES therapy which could immediately reduce the eosinophil count and the improved reversible organ dysfunction quickly [20].

5. Conclusion

Albeit HES is an uncommon disorder, early diagnosis and the choice of an appropriate treatment may prevent progression of the disease.

References

[1] Nayak VH, Engin NY, Burns JJ, Ameta P. Hypereosinophilic Syndrome With Eosinophilic Gastritis. Global Pediatric Health. 2017; 4: 2333794X17705239.

[2] Chusid MJ, Dale DC, West BC, Wolff SM. The hypereosinophilic syndrome: analysis of fourteen cases with review of the literature. Medicine. 1975; 54(1): 1-27.

[3] Valent P, Klion AD, Horny H-P, Roufosse F, Gotlib J, Weller PF, et al. Contemporary consensus proposal on criteria and classification of eosinophilic disorders and related syndromes. Journal of Allergy and Clinical Immunology. 2012; 130(3): 607-12. e9.

[4] Roufosse FE, Goldman M, Cogan E. Hypereosinophilic syndromes. Orphanet journal of rare diseases. 2007; 2(1): 37.

[5] Gotlib J. World Health Organization-defined eosinophilic disorders: 2014 update on diagnosis, risk stratification, and management. American journal of hematology. 2014; 89(3): 325-37.

[6] Karnak D, Kayacan O, Beder S, Delibalta M. Hypereosinophilic syndrome with pulmonary and cardiac involvement in a patient with asthma. Canadian Medical Association Journal. 2003; 168(2): 172-5.

[7] Park J-h, Lee W-s, Park SJ, Yoo W-h. Hypereosinophilic Syndrome Associated with the Onset of Rheumatoid Arthritis: A Case Report. Journal of Rheumatic Diseases (구 대한류마티스학회지). 2017; 24(3):165-8.

[8] Ghersin I, Elias N, Slobodin G, Odeh M. Exacerbation of hypereosinophilic syndrome with pulmonary involvement in two consecutive pregnancies: a case report and review of the literature. International Journal of Research in Medical Sciences. 2017; 2(4): 1774-6.

[9] Bain BJ. Hypereosinophilia. Current opinion in hematology. 2000; 7(1): 21-5.

[10] Shehwaro N, Langlois AL, Gueutin V, Izzedine H. Renal involvement in idiopathic hypereosinophic syndrome. Clinical kidney journal. 2013; 6(3): 272-6.

[11] Klion AD. How I treat hypereosinophilic syndromes. Blood. 2015; 126(9): 1069-77.

[12] Gotlib J, Cools J, Malone JM, Schrier SL, Gilliland DG, Coutré SE. The FIP1L1-PDGFRα fusion tyrosine kinase in hypereosinophilic syndrome and chronic eosinophilic leukemia: implications for diagnosis, classification, and management. Blood. 2004; 103(8): 2879-91.

[13] Bosslet GT, Knox KS, Noor A. Severe idiopathic hypereosinophilic syndrome. Respiratory Medicine CME. 2008; 1(2): 100-2.

[14] Levin HR, Gelfand M. Method and apparatus for treatment of congestive heart failure by improving perfusion of the kidney. Google Patents; 2003.

[15] Leiferman KM, Gleich GJ. Hypereosinophilic syndrome: case presentation and update. Journal of allergy and clinical immunology. 2004; 113(1): 50-8.

[16] Leiferman KM, Gleich GJ, Peters MS. Dermatologic manifestations of the hypereosinophilic syndromes. Immunology and allergy clinics of North America. 2007; 27(3): 415-41.

[17] Cools J, DeAngelo DJ, Gotlib J, Stover EH, Legare RD, Cortes J, et al. A tyrosine kinase created by fusion of the PDGFRA and FIP1L1 genes as a therapeutic target of imatinib in idiopathic hypereosinophilic syndrome. New England Journal of Medicine. 2003; 348(13): 1201-14.

[18] Pardanani A, Ketterling RP, Li C-Y, Patnaik M, Wolanskyj A, Elliott M, et al. FIP1L1-PDGFRA in eosinophilic disorders: prevalence in routine clinical practice, long-term experience with imatinib therapy, and a critical review of the literature. Leukemia research. 2006; 30(8): 965-70.

[19] Martinelli G, Malagola M, Ottaviani E, Rosti G, Trabacchi E, Baccarani M. Imatinib mesylate can induce complete molecular remission in FIP1L1-PDGFR-a positive idiopathic hypereosinophilic syndrome. Haematologica. 2004; 89(2): 236-7.

[20] Fauci AS, Harley JB, Roberts WC, Ferrans VJ, Gralnick HR, Bjornson BH. The Idiopathic Hypereosinophilic Syndrome Clinical, Pathophysiologic, and Therapeutic Considerations. Annals of Internal Medicine. 1982; 97(1): 78-92.