



CASE REPORT

# A Case of Invasive Pulmonary Aspergillosis Resulted from the Treatment of Chronic Eczema

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ABSTRACT

This was an advanced male (87-year-old) with refractory chronic eczema for over 40 years, based on his allergic constitution, accompanied with chronic kidney disease due to primary hypertension (CKD, phase 3). It was so difficult to tolerate the severe itching that the glucocorticoids (GC) had to be applied to it, but some new-onset respiratory symptoms, such as cough, dyspnea after *exertion* etc., occurred to this patient. Some *classical* IPA images were found on his pulmonary CT scanning, which were further confirmed by the positive findings of GM-test, and then a *final* diagnosis of IPA was accordingly established. Unfortunately, a persistent fever emerged after starting an antifungal therapy to the patient, and his IL-2 level was detected to be superhigh. As a response to allergic fever, GC was carefully given intravenously again to treat it, and it turned out to be totally improved since then; suggesting that systemic thinking (integrated with the other clinical evidences) is essential to diagnose IPA, and GC can also be used to improve its *symptoms* with the existence of antifungal therapy.

## 1. Introduction

This was an 87-year-old male, admitted with a complaint of recurrent pruritus on his belly for over 40 years, based on his allergic diathesis. There was a history of five years of primary hypertension (HT, grade III) and chronic kidney disease (CKD, phase 3), but no past history of type 2 diabetes mellitus. A diagnosis of chronic eczema and CKD due to hypertension was accordingly established. For a better efficacy, glucocorticoids was chosen

intravenously to restrain his dermal symptoms, but some respiratory symptoms, such as dry cough, exertional dyspnea etc., emerged as a consequence. A few features about IPA images were found on his pulmonary CT scanning, confirmed by the presence of positive galactomannan in his serum. However, a persistent fever occurred to this patient after starting antifungal therapy (Caspofungin). Seeking for its etiology, his IL-2 level was measured to be superhigh, which meant allergic fever. Being suspected of hypersensitivity to fungal spore, GC was carefully given

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intravenously again to suppress the fever, and finally it turned out being totally improved since then, suggesting that an integration of the other clinical informations (systemic thinking) is important in establishing a diagnosis of IPA, and GC can also be carefully used to treat IPA with the existence of antifungal therapy.

## 2. Case Report

This was an advanced male (87-year-old) who had a chief complaint of recurrent pruritus on his abdominal skin for more than 40 years, associated with his allergic constitution. His sleep was disturbed with this severe itching, leading to anxiety attack. There was a history of five years of primary hypertension (HT, grade III) and chronic kidney disease (CKD, phase 3), and treated with Irbesartan (one type of ARB) 150 mg a day over these years, with a good control of his blood pressure. He denied the past history of type 2 diabetes mellitus.

His blood pressure, in sitting position, was 156/92 mmHg, presented with so much skin rash on his belly, surrounded by erythema (suggesting its allergic nature), together with scattered lichenification. Ebastine (one type of histamine-antagonists) was orally given one tablet (10 mg) a day to kill the severe itching, plus the topical application of urea ointment. Unfortunately, fewer efficacy happened to him, and a diagnosis of refractory chronic eczema, with concomitant CKD was well established at first hand. For a better efficacy, GC therapy (Dexamethasone followed by Metrol) was driven to restrain the dermal symptoms. Unfortunately, some respiratory symptoms, such as dry cough, exertional dyspnea and night sweats emerged to this patient after initiating antifungal therapy. In auscultation, some moist rales were heard on the base of his right lung, and there was slight ankle edema in both lower extremities. His white blood cell reached to  $15 \times 10^9/L$ , with 85% of neutrophil; C-reactive protein (CRP) 110 mg/L (Norm:  $< 8$  mg/L, indicating of allergy). Serum creatinine was 104  $\mu\text{mol/L}$ , converted into 43mL/min/1.73m<sup>2</sup> of eGFR.

On his iconography, there was an oval-shaped focus on the latest pulmonary CT scanning, located underneath the right pleura with a necrotizing cavity in it, surrounded by “foggy” area (Figure 1).

A further detection of galactomannan in serum (GM-test) was followed and it turned out being positive. A diagnosis of IPA for this case was finally set up, and the antifungal therapy, Caspofungin (50 mg, ivgtt, qd $\times$ 14 days), was quickly chosen to kill the aspergilli from IPA. Unluckily, the patient began to experience a persistent fever once starting the IPA treatment. Seeking for febrile etiology, his serum level of IL-2 was measured and

showed being superhigh (365 KU/L), indicating that this was allergic fever, resulted from the catabolic products (galactomannan) of aspergilli killed by the antifungal therapy. Thinking of its allergy nature, Dexamethasone (5 mg) was carefully used intravenously again, expecting fever to subside, to restrain the allergic symptom and it turned out being totally improved since then.



**Figure 1.** An oval-shaped focus located underneath the right pleura with a necrotizing cavity in it, surrounded by “foggy” area

## 3. Discussion

Based on his allergic constitution (a remarkably elevated CRP and IL-2 level), the patient suffered from chronic eczema for over 40 years. Anxiety attack emerged due to insomnia disturbed by the severe pruritus. Treated with histamine-antagonists at first hand, but no relief was achieved, and glucocorticoids had to be applied intravenously, as a suppressant, to his severe itch for a better efficacy. Unfortunately, some new-onset respiratory symptoms, including cough, exertional dyspnea after exercise etc, emerged while his dermal symptoms were disappearing. As a consequence, some classical IPA images were demonstrated on his pulmonary CT scanning, and a diagnosis of IPA was further confirmed by the positive findings in galactomannan detection(GM-test)<sup>[1]</sup>. Originated from “chronic eczema”, a final “IPA” was achieved by means of skin itching and its resultant application of GC on the basis of CKD, suggesting that the systemic use of GC should be carried out cautiously in the advanced inpatients with CKD (a poor immunity).

As a response to IPA, Caspofungin was chosen to treat it intravenously. Unluckily, the patient with an allergic diathesis began to experience a persistent fever after the beginning of the IPA treatment, with a superhigh level of IL-

2, meaning allergic fever, due to the catabolic fragments of aspergilli killed by caspofungin [2]. Considering its allergic nature in fever, GC was modestly given again to suppress the hypersensitivity, and it subsided since then; showing that a minor dose of GC could be used, with the protection of caspofungin, to prevent multiple organs from damaging and benefit from shortening the course through reducing the severity of inflammatory reaction [3].

The establishment of diagnosis of IPA in this case originated from the comprehensive consideration initially, instead of the report of medical imaging science. A few features about IPA images were found on his iconography, integrated with his advanced age, the history of CKD and the application of GC (a poor immunity) finally, a diagnosis of IPA for this case was reasonably made, and it was further confirmed by a positive GM-test [4]. We thought that it is relatively localized to make a diagnosis depending mainly on iconography. Instead, combined with other clinical informations, as a whole, a diagnosis of certain unknown condition, such as IPA, can be well established. In addition, there is dualism in the application of GC [5], and it can be used to treat IPA with the existence of anti-fungal therapy.

#### **4. Conclusions**

In short, systemic thinking (integrated with the other clinical information), we think, is crucial to make a diagnosis of IPA except iconographic features; in which, GC

can also be carefully used to improve some symptoms of IPA with the presence of antifungal agents.

#### **Conflict of Interest**

There is no conflict of interest.

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