

Review

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Posted Date: 5 July 2023

doi: 10.20944/preprints202307.0316.v1

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Review

Briefly on Fungal Allergens and Mold Allergy Diagnosis

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Abstract: Immunology is a branch of medicine that studies the immune system and its pathology. There are known scientific informations, that in medical immunology specific tests performed in the laboratory for diagnosis. In addition good to mention that allergies include medical diagnostic methods such as blood tests. Also there are used for detection the presence and the levels of IgE antibodies. Examples of allergens include for example pollen, house dust, some herbs or molds, some animals and certain foods. Currently within the present description aim to discuss some aspects referring to fungal allergen and mold allergy diagnosis, in a briefly following steps of our purposed shortly review.

Keywords: allergens; diagnosis; allergy; treatment; management; strategies

1. Introduction

Allergic pathology is better known as a disease with a higher incidence nowadays. Mold within symptoms in peoples, caused diagnosed diseases as allergy and asthma and is a type of fungus that produces spores which float through the air., as it is known from the past. [12] A mold source can send the spores into the air, which are dangerous from healthy. In how they reproduce and grow, molds are specific from plants and also distinct to the animals. Spores causes allergic reactions in people. [3] Many questions and unclear things are in scientific world, about the patho-mechanism of allergic diseases. In principle researchers try to test allergens for a proper diagnostic and also for a good treatment which is specific for each patient. Symptoms from allergy for fungus spores are common in restrictive period of time. Allergens, in the spring become dangerous but in the winter become inactive. Many molds grow routinely in different places. Unfortunately pollen, molds do not die so easy. Also, most outdoor molds become dangerous. [4] Researchers and their studies, try to find, pathophysiology mechanism about mold allergy diagnostic. In this context, results of studies, conduct to conclude about fungal allergy prevalence and immunotherapy efficacy. More than it is important to establish as well the diagnosis and therapy of fungal allergy.

During history, in 1921, was studied the first existence of a presumptive substance with a response to hypersensitivity. This research directions was demonstrated by Ishizakas and co-workers. Than WHO International Reference Centre for Immunoglobulin, told plenary about previously mentioned informations referring to the immunology implied in allergy and concretly scientists told plenary about the presence of a fifth immunoglobulin isotype, IgE. Referring to IgE and allergy, Coombs and Gell pointed reactions types in allergy as I, II, III. [5] Different studies and their finally discussions and results, show us that the symptoms of allergens on the peoples, affecting health, play a role also in the environmental life medium. [6] The clinical manifestations, signs and symptoms of hypersensitivity reactions, affect sensible organs to peoples from different groups of age and from different areas of life as urban or rural areas of residence. [7,8] In context referring to allergic diseases, human individs sensible to mold has different signs and symptoms, more severe in asthma, comparing for example, with allergic rhinitis [9] Important to know and to present a very poor shortage about treatment directions in allergic diseases. We have not enough knowledges from practicum, about importance of AIT for treat and for cure allergy, if possible maybe. The important thing referring to AITs for different molds is a lack of standardized extract allergens. [10] The European Academy of

Allergy and Clinical Immunology (EAACI) did not recommended AIT for mold extracts in treatment to youth. As a true curiosity, lack of efficacy and safety, was observed of mold extracts therapy.[11] Nowadays, not many results of specific research studies, referring to the usage of fungal extracts for immunotherapy. report a relatively poor reduction in signs and symptoms, in patients diagnosed with allergic disease. [12–14]

2. Traditional knowledges on allergy

Not new, that allergy has shown a higher prevalence in the last few decades. From past history, in the nineteenth century, has been started allergology as a scientific medical field of study. The central descriptions has been the hay fever. In the twentieth century research studies had in attention the anaphylaxy. Also the research conduct to routinely applications, as Prausnitz-Küstner test and IgE discovery. Another preoccupation in medicine was on T-cell description with subsets Th1 and Th2., knowing as an important progress in medicine and more exactly in immunology. Referring to allergy and environment, including the role of pollutants in allergy, it is known that are more and different types of factors and products in environment. All of them has a bad impact on healthy. Figure 1.

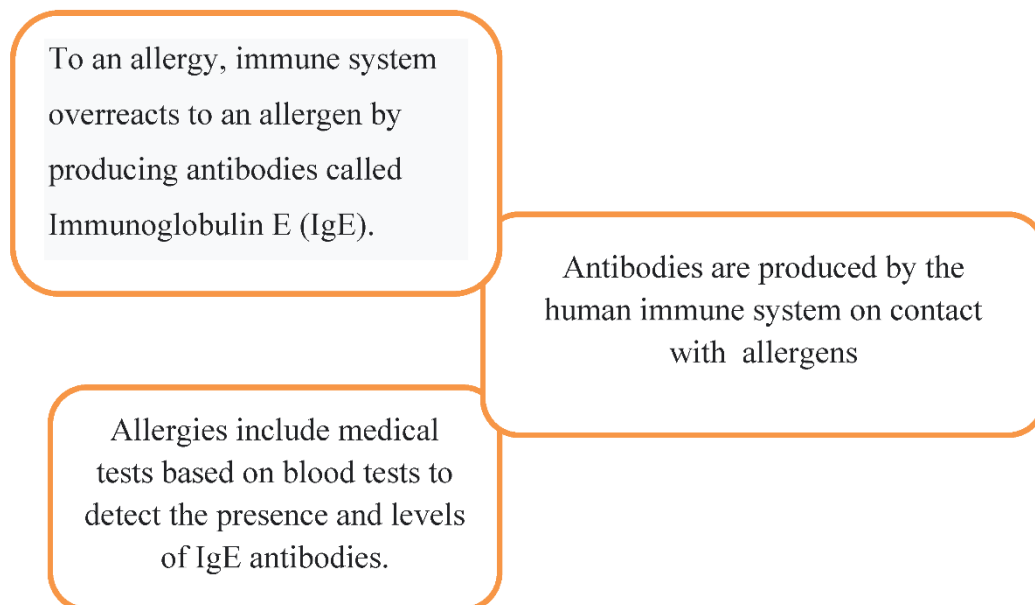


Figure 1. Key points on pathophysiology in allergy.

During years, scientific medical progress in allergy diagnostic, has in attention, laboratory tests, which are used basophils and mast cells. In this direction, allergen-specific immunotherapy was introduced also for allergy diagnostic. Also the first description to histamine was a great knowledge for medical purpose and in addition leukotrienes were also detected. In progressive experimental medicine for allergology and immunology field of research, medicins for therapeutics have been discovered, for practicum applications, related atopy.[15] Allergy was defined and also anaphylaxy. In 2005, an interdisciplinary team, named as experts, pointed the recognition of negative symptome in allergy disease, knowing as anaphylaxia. More than, in addition, experts designated the criteria for allergy and connected comorbidities, diagnosed. [16] Actually, it is know that allergy and immune system overreacts to a specific allergen. Then it follows antibodies production known such as Immunoglobulin E (IgE). Figures 2 and 3

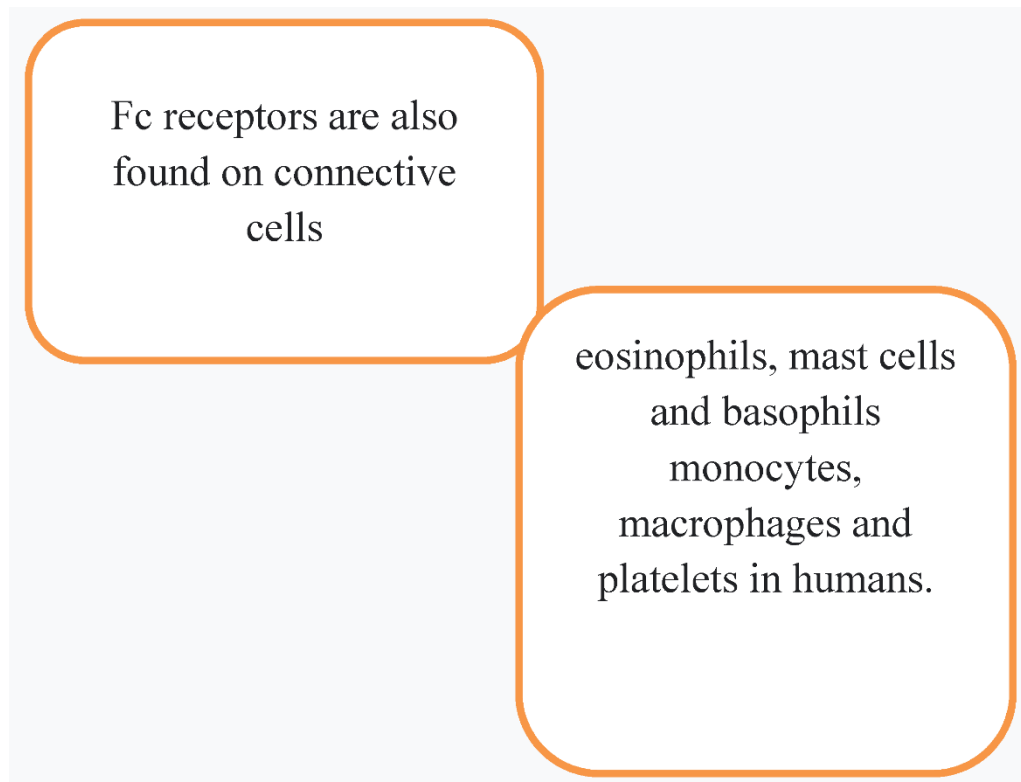


Figure 2. Key points in allergy immune mechanism.

There are two types of Fcε receptors:

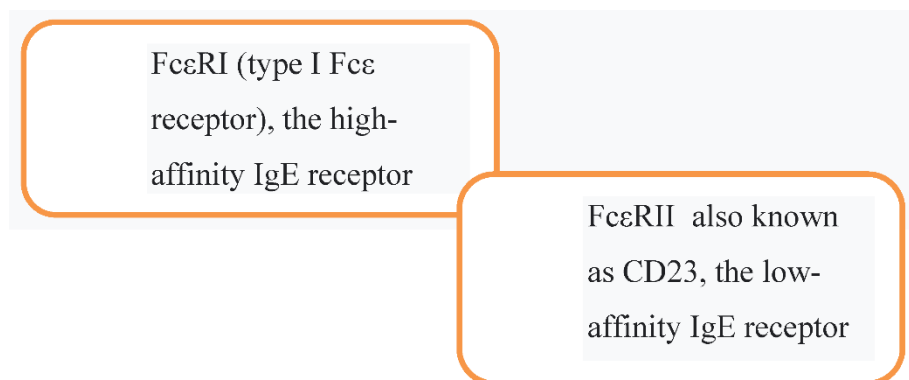


Figure 3. Fcε receptors:.

3. Nowadays diagnosis principles in allergy to fungi

Nowadays, there are knowledges about the guideline (S2k) referring to allergen-specific immunotherapy (AIT), as a specific therapy with a great purpose in modifying effects of allergic disease. In this direction, using allergen extracts, could be possible antibodies blocking activated. Beside previously mentioned idea, in reaction following steps, mediators and tolerance-inducing cells, are also activated. This pathophysiologically mechanism together with others specific points, play a role in prevention of exacerbation of the allergen-triggered immune response. Finally point, is blocking the specific immune response with attenuation in the inflammatory tissue response. [17] Pathophysiology in allergy, is complex. There are different mechanisms depending on the basic cause. In one of pathological way, we can tell about haptens. So, the hapten (drug) binds directly to connective cells as mast cells, with implications in the immune system. Connective cells, concretely mast cells proceed to degranulation. Then, is released histamines. and also chemotaxis. [18,19] Medications can become immunogenic, knowing informations by this smallest covalently structures. This little compounds

could be observe, as specific structures forming hapten complex. The human leukocyte antigen (HLA) molecules is an important end point in pathophysiology mechanism of allergy. In addition we can mention that in the liver metabolism, cytochrome P450 enzymes play a role, forming metabolites then become pro-haptens. [20,21] There are knowledges reffering to a concept of a direct immune response to drugs and other biologic products for therapies that use proteins in order to stimulate a proper response. Nowadays, in allergy diagnosis, in research activity, genetic compounds is important, in attention with TCRs and HLA. Some drugs, which produce a specific reaction, are also in research attention. At the end of alergic pathology reactions, in the human body, could be observe a specific systemic symptoms, as drug-induced hypersensitivity syndrome, (DRESS/DiHS) and additionally blood hemoleucogram modifications with an eosinophilia [22–25] PiLA model is also important to mention in this field. [23] Actually knowing about very complex signs of allergy pathology, we can mention that there are not enough studied in this diseases, to look for specific symptoms to patients.[26,27] Figure 4.

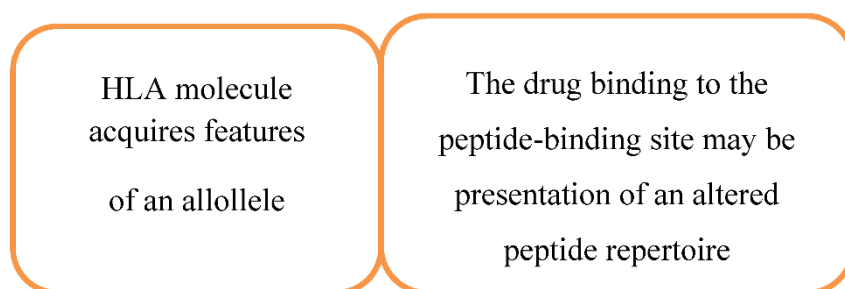


Figure 4. PiLA model. Specific key points.

Risk factors for disease:

1. Chronic obstructive pulmonary disease (COPD), disease with allergic subacute reactions to patients after medication administration.
2. Obesity affects asthma pathogenesis and symptoms
3. Cardiac and hypertensive patients, diagnosed also with allergy, blockers inhibitors are using for treatment [28]

People must be carefully to daily diet in allergy, in order to avoid negative symptoms. So, there are known types of foods which contain various substances with a bad potential in inducing anaphylaxis signs in allergic persons. [29–31] Concluding, in illnes persons, diagnosed with allergy, anaphylaxis should be take into consideration.[32,33]

Reffering to epidemiology of allergy, laboratory diagnostic criteria are signifiant. Allergic rhinitis is also a common pediatric disease. Pathophysiology of allergic rhinitis with Th2 responses in disease mechanism and also pharmacological and immuomodulating therapy are proper for treat. Prevalence in allergic rhinitis (AR) has increased significantly. [34–36] We can mention that in allergic rhinitis, commonly pathology to children, could be observe developing symptoms as early age, starting with 6 years old. [37 - [39] Common allergens include an enlarge types [40,41] Antihistamines are used as medication to treat allergic rhinitis.[42–44], In allergen immunotherapy (AIT) blood cells as basophil cells, can demonstrate a potential tolerogenic roles of IgE/FcεRI signaling in DCs in the setting of AIT. [45] Important to mention that cytokines profiling was investigated in allergic rhinitis treatment. [46] Connective cells as basophils are mediators with a great role in initiating early phase responses in allergic rhinitis. Long- term therapy can reduce the threshold of basophil activation, which highlights the importance of AIT in treatment with a finally end point stopping the disease progression. [47]In allergic rhinitis (AR) diagnosed, nasal epithelial cells were used samples. RNA samples were extracted from previously mentioned mucosa, for laboratory analyse (Figure 5).[49]

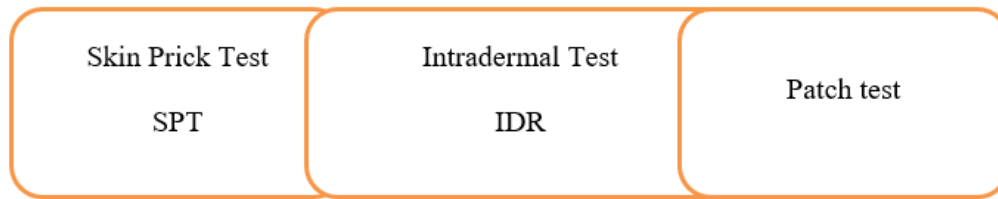


Figure 5. Skin tests used in allergy diagnosis.

4. Future directions for the diagnosis of allergy to fungi

Nowadays studies offer us an enlarged perspective from different medical fields as anatomy and physiology. Currently findings refers to few directions in optimizing allergic diseases management. For this medical purposed objectives, play a central scientific role news in allergic sensitivity and allergen exposure. Also medical strategies refers to studies and their results in allergic diseases comorbidities. As a future direction of research, could be a proper communication between neuroendocrine mediators, nerve fibers and immune cells in allergic diseases also could be observe during studies. Diagnosis in allergy is more challenging in patients with dual AR (DAR). Relatively recently defined AR phenotype is a great key point for future diagnosis in allergy. In this mentioned circumstance, the DAR patients display perennial and seasonal allergies-related nasal symptoms. [50,51]. A present but also future perspective, is relation between the adverse role of psychological stress in allergic disease. As a long term future direction, is importance to find more accurate assessment of the specific impact of stress on various regulatory and effector components of the immune system.

5. Conclusions

Molds produce mycotoxins, unfortunately with carcinogenic, teratogenic and neurotoxic properties, with a possible negative impact on individual healthy. Allergies related to fungi together with comorbidities, mainly concern immunocompromised patients. The currently describing knowledges in the field of allergy between fungal allergens and human subjects, and also established the diagnosis and treatment, offer us a complex vision. For the future, hope to find into the research studies, proper knowledges in this field, with applicability in routine practice.

Author Contributions: Conceptualization; methodology; software; validation; formal analysis; investigation; resources.; data curation; writing—original draft preparation; writing—review and editing; visualization;

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The author have disclosed no conflict of interest. This study was independently conducted without financial grants from any group or institution. Author have read and agreed to the published version of the manuscript.

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