

The effects of fungus spores on asthma

Abstract

Fungi are living organisms that spread cosmopolitan in the world and affect people directly or indirectly in our daily life. Cross-ocean and intercontinental wind activity and numerous fungus spores have potential to affect public health by moving between large distances. Fungus spores are caused by asthma leading to diseases in humans and it is known that fungus spores are triggered by increasing concentrations in the environment. In this study, the fungus spores that trigger asthma are briefly mentioned.

Keywords: asthma, fungus spores, airborne, aeromycology

Volume 5 Issue 7 - 2017

Mustafa Sevindik

Department of Biology, Akdeniz University, Turkey

Correspondence: Mustafa Sevindik, Department of Biology, Faculty of Science, Akdeniz University Antalya, Turkey, Tel +905327484228, Email sevindik27@gmail.com

Received: October 22, 2017 | **Published:** December 22, 2017

Introduction

The spores have formed by fungi and these spores have developed characteristics that enable them to cope with the stresses of survival and disintegration. In the distribution of fungus spores in the atmosphere, it is important in the meteorological factors as well as the features of the fungus. The meteorological factors that play a role in the distribution of fungus spores are temperature, humidity, rain and wind. The fungus spores, especially spreading from one region to another with the effect of winds, increase their concentrations in the atmosphere with other meteorological factors and the geobotanical characteristics of the region. Fungus spores in the atmosphere form a significant part of the airborne bio particles and can be found in every period of the year in the atmosphere. Fungus spores in the atmosphere may cause adverse effects on living organisms under appropriate conditions. The number, diversity, production and transport of airborne fungus spores vary according to time of day, weather, season, and geographical region, geobotanical characteristics of the region and the presence of local spore resources.^{1,2} The diversity of fungus spores in the atmosphere is quite high. The detection of the diseases that this fungal diversity reveals is very important in the treatment of the disease. Fungus spores are caused by asthma at the beginning of diseases caused by humans and it is known that fungus spores are triggered by increasing concentrations in the environment.³ Studies on the relationship between asthma and fungus spores are generally limited to specific species.

Generally determined fungus spores are fungus taxa such as *Alternaria*, *Cladosporium*, *Ganoderma*, *Aspergillus* and *Penicillium*. But fungi are quite varied and all of them produce spores. The vast majority of these spores, produced by fungi, are found in people's breathing air. Different types of spores may have different potentials for asthma formation due to their different surface properties or internal metabolism. For example; *Alternaria* and *Cladosporium* are more easily cultured and found abundantly in the atmosphere, whereas fungus spores such as *Aspergillus*, *Trichophyton* and *Malassezia* are less common than these spores and are more common in humans.^{4,5} In a UK study, it was reported that an acute asthma outbreak was associated with an increase in atmospheric activity of *Didymella exitialis* ascospores and *Sporobolomyces* basidiospores.⁶ Also; there is a strong correlation between asthma symptoms and exposure to fungal spores such as *Alternaria alternata*, but not everyone is sensitive due to genetic or other conditions. In addition, fungus spores, as well as hyphae, which are much more common than spores, also play an important role in the emergence and development of asthma symptoms. Hif parts can typically be smaller in size than spores (1 mm) and penetrate the lungs more effectively.^{7,8}

Although it is not usually taken into account that the fungus spores that are found in the atmosphere cause seasonal allergic symptoms, such as allergic sensitization and acute respiratory failure, It is a very important parameter. Thus, the diversity and concentrations of fungal spores in the atmosphere and their association with meteorological factors can provide valuable information in the clinical treatment of allergies.⁹⁻¹¹ At present, atmospheric fungus compositions of many regions have not been established yet. Furthermore, there are still many unknown parameters about the production, distribution and changes in the content of allergens of fungus spores.

Conclusion

With the studies to be carried out in this context, these parameters can be revealed and allergen fungi can be determined and their monitoring can be provided. Future research is needed to examine the effects of fungal spores exposure on related health problems.

Acknowledgements

None.

Conflict of interest

The author declares no conflict of interest.

References

1. Oliveira M, Ribeiro H, Delgado L, et al. The effects of meteorological factors on airborne fungal spore concentration in two areas differing in urbanization level. *Int J Biometeorol.* 2009;53(1):61–73.
2. Sadys M, Skjøth CA, Kennedy R. Back-trjectories show export of airborne fungal spores (*Ganoderma* sp.) from forests to agricultural and urban areas in England. *Atmospheric Environment.* 2014;84:88–99.
3. Denning DW, O'Driscoll BR, Hogaboam CM, et al. The link between fungi and severe asthma: a summary of the evidence. *Eur Respir J.* 2006;27(3):615–626.
4. Rivera-Mariani FE, Bolanos-Rosero B. Allergenicity of airborne basidiospores and ascospores: need for further studies. *Aerobiologia.* 2012;28(3):83–97.
5. Akgül H, Yılmazkaya D, Akata I, et al. Determination of airborne fungal spores of Gaziantep (SE Turkey). *Aerobiologia.* 2016;32(3):441–452.
6. Packe GE, Ayres JG. Asthma outbreak during a thunderstorm. *Lancet.* 1985;326(8448):199–204.
7. Denning DW, O'Driscoll BR, Hogaboam CM, et al. The link between fungi and severe asthma: a summary of the evidence. *Eur Respir J.* 2006;27(3):615–626.

8. Sahakian NM, Park JH, Cox-Ganser JM. Dampness and mold in the indoor environment: implications for asthma. *Immunol Allergy Clin North Am.* 2008;28(3):485–505.
9. Hollins PD, Kettlewell PS, Atkinson MD, et al. Relationships between airborne fungal spore concentration of *Cladosporium* and the summer climate at two sites in Britain. *International Journal of Biometeorology.* 2004;48(3):137–141.
10. Grinn-Gofron A, Bosiacka B. Effects of meteorological factors on the composition of selected fungal spores in the air. *Aerobiologia.* 2015;31(1):63–72.
11. Sindt C, Besancenot JP, Thibaudon M. Airborne *Cladosporium* fungal spores and climate change in France. *Aerobiologia.* 2016;32(1):53–68.