Molecular Identification of *Aspergillus* species in bronchoalveolar lavage specimens of susceptible children with respiratory disorders

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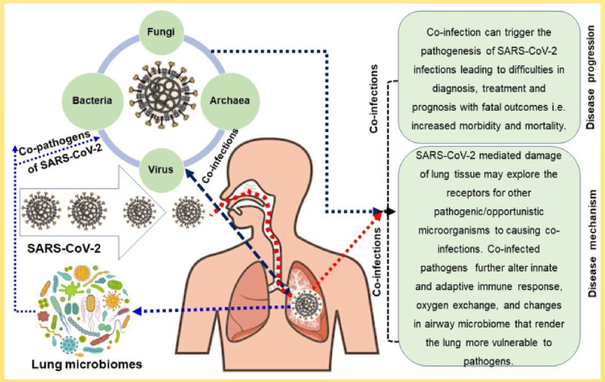
Introduction

Fungal infections of the lungs are relatively common, and potentially life-threatening in children. These infections are mainly caused by *Aspergillus* species. It further infects children with congenital immunodeficiency, especially granulocyte dysfunction. The aim of this study was to identify the fungal species of *Aspergillus* agents in the bronchoalveolar lavage (BAL) specimens of children referred to Akbar Hospital in Mashhad.



Methods

In this study, 210 BAL specimens were prepared and studied during 27 months (April 2018 to July 2020) in Akbar Hospital, Mashhad, from children hospitalized and susceptible to respiratory diseases. For comprehensive analysis of the specimens, in direct examination of the specimens, potassium hydroxide 10% was used and for culture, sabouraud dextrose agar medium containing chloramphenicol (SC) was used. Finally, molecular PCR sequencing using calmodulin gene was used to identify *Aspergillus* species. The data were analyzed using SPSS software version 22, and Chi-square, Fisher's exact test and T. test.

Results

Among the studied specimens, 120 patients (57.1%) were male and 90 patients (42.9%) female. Their age range ranged from 2 months to 16 years.

Out of the total hospitalized patients, 208 patients (99%) used corticosteroids, 73 patients (34.8%) had neutropenia and 84 patients (40%) had various underlying diseases. The most common cause of *Aspergillus* was *A. welwitschiae* 4 (50%), *A. fumigatus* 3 (37.5%), and *A. flavus* 1 (12.5%) (Fig. 1). In children with pulmonary fungal infections, 7.6% were in the age range of 0-4 years, 4.8% in the age range of 5-8 years and 0.9% in the age range of 9-12 years.

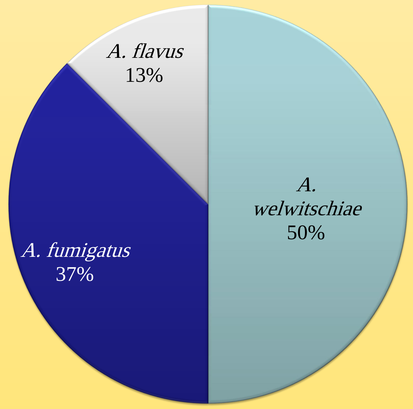


Fig. 1. frequency of *Aspergillus*isolates

Conclusion

A. welwitschiae was the most common fungal agent in pediatric BAL specimens. These affected patients had underlying disorders such as pneumonia, asthma, respiratory distress, lung collapse, cystic fibrosis and immunodeficiency. It seems that among diagnostic and treatment strategies of children with respiratory disorders, fungal infections should be considered.

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