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RES-209

Utility of DNA sequencing analysis of fungi derived from airway secretions in patients with refractory asthma in the diagnosis of allergic bronchopulmonary mycosis.

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Background

Allergic bronchopulmonary myosis (ABPM) is a chronic airway disease characterized by progressive destruction of the bronchi due to an allergic reaction to fungi inhaled into the trachea.

ABPM is often caused by Aspergillus spp.; other fungi are rare. However, identification of this fungus is often difficult.

The diagnosis of ABPM is important because patients with refractory asthma may develop this disease.

We studied refractory asthma patients diagnosed with ABMP who had a history of outpatient care at Osaka City Juso Hospital in a retrospective study.

Method

We retrospectively selected patients with refractory asthma who visited our Hospital between September 2024 and June 2025 and evaluated the proportion of those with ABPM.

Refractory asthma was defined based on the Japanese Respiratory Society (JRS) Guidelines for the Management of Refractory Asthma as asthma patients who require high-dose inhaled steroid therapy.
We collected the following data from the medical records of each patient: age, sex, smoking history, inhaled medications, and oral steroid(OCS) use. We classified inhaled medications as follows: inhaled corticosteroids combined with long-acting beta-2 agonists (ICS/LABA) and inhaled corticosteroids combined with long-acting beta-2 agonists and anticholinergics (ICS/LABA/LAMA).
We diagnosed ABPM based on the Guidelines for Allergic Bronchopulmonary Aspergillosis.
We used DNA sequencing of the internal transcribed spacer (ITS) region and of the D1–D2 region to identify the fungi.

Result

Patient dates is shown in Table 1.

The analysis included 49 patients with refractory asthma.
The 49 patients included 17 males and 32 females(65.2% women) , with a median age of 63.
23 patients(46.9%) had a history of smoking, and 7 patients(14.3%) were using OCS.
More patients were using ICS/LBA/LAMA inhalers.
And two of the 42 patients(4.8%) were diagnosed with ABPM.
The fungi responsible for each case of ABPM were *Penicillium citriunm* and *Fusicolla* sp.

Table1

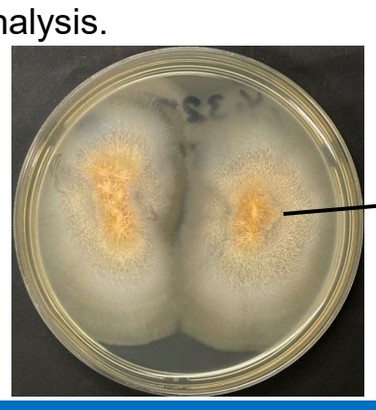
	N=49
males/females	17/32
Median age(range)	65.2(58-98)
Smoking history	59.2%(29/49)
Inhaler	
ICS/LABA	46.9%(23/49)
ICS/LABA/LAMA	53.1%(26/49)
OCS	14.3%(7/49)
ABMP diagnosed cases	4.8%(2/42)
The causative fungus	
Penicillium citrinum	2.38%(1/42)
Fusicolla sp.	2.38%(1/42)

Case

Case1:
Age: 61 Sex: female
Smoking history: ex-smoker
Medical history: She was referred to Osaka City Juso Hospital because her CT scan showed abnormal shadows in her chest. The CT scan revealed mucus plugs. Since we were unable to diagnose ABPM through sputum examination, we identified *Penicillium citrinum* in the bronchoscopy specimen using ITS analysis.

Penicillium citrinum.

Case2:
Age: 49 Sex: female
Smoking history: never smoker
Medical history: She was referred to Osaka City Juso Hospital for evaluation due to persistent cough and abnormal shadows in her chest. We could only identify filamentous fungi in sputum tests and isolated *Fusicolla* sp. using ITS analysis.



Discussion

The species *Penicillium* inhabit a wide range of environments, including soil, air, and humid indoor spaces. *Penicillium citrinum* also inhabits food and humid indoor environments. And *Fusicolla* sp. also inhabits soil and aquatic environments and is a close relative of *Fusariumu*.
ABPM is frequently caused by Aspergillus species, but cases caused by Penicillium and Fusarimu species have also been reported.
Fusicolla sp. is a close relative of Fusarium and is considered a possible causative agent of the ABPM in Case 2.
In both cases, asthma control improved significantly after environmental modifications, suggesting that ABPM diagnosis was important.

Conclusion

DNA sequencing is useful for identifying the causative organisms of ABPM.

Reference

Guide to Allergic Bronchopulmonary Aspergillosis

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