COMPLICATED PULMONARY ASPERGILLOSIS WITH PNEUMOTHORAX AND PNEUMOPERICARDIUM IN A CHILD WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Invasive aspergillosis is a fungal infection that is being observed increasingly in immunocompromised patients due to the use of more aggressive chemotherapeutic regimens. To our knowledge, no case of pneumothorax and pneumopericardium associated with invasive pulmonary aspergillosis has been reported to date. High-dose amphotericin B (1 to 1.5 mg/kg/day) is the treatment of choice, although severe side effects, especially hypokalemia, are very common. Itraconazole is considered to be a therapeutic alternative for invasive pulmonary aspergillosis in immunocompromised patients. A rare combination of pneumothorax and pneumopericardium associated with systemic aspergillosis in a child with acute lymphoblastic leukemia is described. Treatment with low-dose amphotericin B and itraconazole achieved complete resolution of the foregoing complications.

Keywords  amphotericin B, aspergillosis, itraconazole, pneumopericardium, pneumothorax

The most important fungal infections in the compromised host are caused by Candida and Aspergillus species. As the number of patients with host defenses compromised by disease and/or therapy have increased, so has the importance of invasive fungal infection causing significant morbidity and mortality in patients with malignant hematologic disease [1]. The lungs are the classic site of infection by Aspergillus species in 90% of the patients. The best approach to early diagnosis has not been established as yet, and the prognosis depends on the underlying disease and recovery of an adequate granulocyte count.

Herein we describe a rare combination of pneumothorax and pneumopericardium associated with systemic aspergillosis infection in a single
case that was treated successfully with low-dose amphotericin B and itraconazole.

CASE REPORT

A 7-year-old boy was admitted for therapy of acute lymphoblastic leukemia (ALL) in the first hematologic relapse. Reinduction treatment utilized one course of dexamethasone, 6-mercaptopurine, high-dose cytarabine, high-dose methotrexate, and L-asparaginase [2]. A second complete remission was achieved within 40 days. During the first episode of neutropenia the patient developed fever and empirical treatment with broad-spectrum antibiotics was instituted. No bacteria were isolated. He had hepatomegaly and mild respiratory distress. Chest radiography showed two pulmonary infiltrates in both fields. Erythromycin, high-dose trimethoprim/sulfamethoxazole and amphotericin B (1.5 mg/kg/day) were added to the empiric broad-spectrum antibiotic therapy. Routine cultures were negative. One week later the child was well; he had no fever and had recovered from neutropenia. A control chest film revealed infiltrates in the right lung, which progressed to consolidation and subsequent cavitary lesions (one was very close to the right side of the pericardium) and consolidation in the upper lobe of the left lung. A typical image of pneumopericardium as sphere heart was observed (Figure 1).

He had progressive respiratory distress. A chest film showed that 50% to 70% of the right lung had collapsed and a moderate right pneumothorax was evident in the right lobe (Figure 2). Two tubes were placed for drainage. Bronchoalveolar lavage was performed. Direct observation disclosed mycelial filaments and Aspergillus fumigatus were isolated. Elevated titers of anti-Aspergillus antibodies were detected by radioimmunoassay [3].

Lung computed tomography showed two consolidations in the right posterior zone of the right base, extensive consolidation in the left lobe, and the presence of air in the pericardium.

Initial treatment with high-dose amphotericin B (1.5 mg/kg/day) produced severe hypokalemia. The dose was reduced to 0.5 to 0.6 mg/kg/day and itraconazole, 5 mg/kg/day in a single oral dose, was added.

Four weeks later the patient had improved clinically and radiologically. A chest film showed only residual infiltrates in both lungs and the pericardium was normal. He completed amphotericin B treatment to a total dose of 1652 mg. At present he is in complete remission and is awaiting bone marrow transplantation.
DISCUSSION

The factors predisposing to aspergillosis (prolonged granulocytopenia, corticosteroid, and broad-spectrum antibiotic therapy) were all present in our patient [4]. Some cases of aspergillosis have been ascribed to intra- and extrahospital building work and to the contamination of the ventilation systems [5]. Construction work was underway in the operating rooms of our hospital at the time this case was observed. No environmental contamination had been documented in the unit previously; however, a routine examination conducted at that time isolated *A. fumigatus* from the ventilation system of our unit.

The patient was diagnosed on direct observation of mycelial filaments; *A. fumigatus* were isolated and he had elevated titers of anti-*Aspergillus* antibodies, although the usefulness of tests for *Aspergillus* species antibodies has been reported to be limited [3].

Pneumothorax or pneumopericardium associated with invasive pulmonary aspergillosis, although rare, has been described elsewhere [6, 7]. To our knowledge, however, the combination of both conditions associ-
ated with systemic aspergillosis infection in a single case has not been reported to date.

Although high-dose amphotericin B (1 to 1.5 mg/kg/day) is the treatment of choice, it can cause severe side effects [8]. We therefore lowered the dose to 0.5 to 0.6 mg/kg/day and added single oral dose of itraconazole (5 mg/kg/day), a drug which has been proved effective in the treatment of pulmonary aspergillosis in immunocompromised patients [9].

Although the mortality rate in these patients is high [4, 5, 10], in our patient treatment was effective and achieved cure.

REFERENCES


