Treatment of Invasive Fungal Sinusitis with Liposomal Amphotericin B : A Report of Four Cases

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Abstract

Invasive fungal sinusitis increasingly causes significant morbidity and mortality in immunocompromised patients. It is difficult to treat. Despite standard treatment by surgical debridement and intravenous amphotericin B, morbidity and mortality remain high. Conventional amphotericin B is the standard drug but its use is limited by dose-related nephrotoxicity and infusion-related acute toxicity. Liposomal amphotericin B has proven to be as effective as conventional amphotericin B with less nephrotoxicity and infusion reaction. We report four cases of invasive fungal sinusitis who were treated with liposomal amphotericin B after having severe side effects from conventional amphotericin B. There were two cases of mucormycosis and two cases of aspergillosis. All patients had diabetes millitus. One patient had systemic lupus erythematosus and another was receiving immunosuppressive drugs after kidney transplantation. All cases needed multiple operations for sinus surgery. Two cases had acute reaction to amphotericin B infusion, one had active lupus nephritis with renal insufficiency, and one was considered treatment failure from amphotericin B. The patients received liposomal amphotericin B at the total doses of 4.55-8.85 g. Two cases of mucormycosis were considered to be successfully treated. In cases of aspergillosis, one was considered improved and another one with immunocompromised status died with active disease. From our experience, surgery is the main treatment for patients with invasive fungal sinusitis and liposomal amphotericin B is an effective alternative drug for adjuvant medical treatment. However, the degree of immunosuppression of the patients, the extension of fungal sinusitis and perhaps the species of fungus are important factors determining the clinical response.

Key word : Invasive Fungal Sinusitis, Liposomal Amphotericin B, Treatment

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Invasive fungal sinusitis is an important cause of morbidity and mortality among immunocompromised patients. Successful treatment of the disease is difficult to accomplish. Despite the standard treatment combining surgical resection and conventional intravenous amphotericin B, the mortality is still high[1]. In addition to surgical resection, the main factor determining the clinical outcome[2-4], an effective antifungal drug is indicated in invasive disease. Conventional amphotericin B treatment is the standard therapy but it is limited by dose-related nephrotoxicity and infusion-related acute toxicity. Liposomal amphotericin B has been proven to be as effective as conventional amphotericin B but with less nephrotoxicity[5-14] and with least acute infusion reaction[15]. However, there are only a few reports on the use of this drug in invasive fungal sinusitis[16,17]. In this study we describe our experience in treating four cases of invasive fungal sinusitis with the combination of surgery and liposomal amphotericin B.

CASE REPORT

Case 1

A 71-year-old woman from Nontaburi came to Ramathibodi Hospital 4 months prior to admission because of chronic nasal congestion and purulent rhinorrhea. She had been well until 4 months prior to admission when she developed nasal congestion and purulent rhinorrhea. She was diagnosed as left maxillary sinusitis and treated with oral antibiotics for weeks without improvement. Sinuscope and mucosal biopsy was done and the pathological report revealed acute and chronic inflammation. She was lost to follow-up without clinical improvement, until one month prior to admission, when she developed painful swelling of the left cheek. At this time she had no rhinorrhea, fever or headache. Her vision was normal. The ear-nose-throat examination showed tender left side of the nose with a yellowish crust on the left nostril, mild swelling of the left side of the hard palate. There was tenderness at the left maxillary sinus area. The eyes, ears, nasopharynx, oropharynx, and larynx were normal. Plain film of paranasal sinuses showed haziness of the left maxillary, sphenoid, and ethmoid sinuses with bony destruction of the wall of the left maxillary sinus. CT scan of the paranasal sinuses revealed ill-defined an inhomogeneous soft tissue mass with bony destruction of the left maxillary, left sphenoid, and left ethmoid sinuses, the left side of the hard palate, and the floor of the left orbit without optic nerve or extraocular muscle involvement. The mass also extended into the left nasal cavity. Sinuscopy was done and mucosal biopsy of the left maxillary sinus showed acute and chronic inflammation with focal granulomatous inflammation and presence of fungal hyphae compatible with mucormycosis. The special stain showed fungal hyphae compatible with mucormycosis. Pus from the left maxillary sinus was sent for culture for aerobic bacteria, fungus, and mycobacterium and later resulted in no growth of organism. She was also found to have diabetes millitus with mild renal insufficiency. She was admitted after the report of the tissue biopsy for proper treatment.

On admission, vital signs were normal. She was slightly pale but not icteric. The eye-ear-nose-throat examination revealed the same findings as the previous month. The other examinations including cardiovascular, pulmonary, abdomen, and neurology were normal.

Laboratory examinations showed a haemoglobin of 10.7 g/dL with normal red blood cell morphology, fasting blood glucose, blood urea nitrogen and creatinine of 277,16, and 1.5 mg/dL, respectively. Other laboratory investigations including chest radiography, liver function tests and serum electrolytes were within normal range. Anti HIV antibody was negative.

Amphotericin B was tested and then given at the dose of 1 mg/kg/day. The patient developed a high fever with chills and dizziness during infusion. Even with premedication the next day, she still had the same reaction. So the drug was discontinued and liposomal amphotericin B was started at the dose of 3 mg/kg/day and she tolerated the drug well. Blood glucose was controlled by insulin.

Denker operation was performed on the left side, necrotic tissue was found in the left maxillary sinus with necrotic bone at the medial, inferior, lateral, and superior wall. All of these pathologic tissues were totally removed. The pathologic diagnosis of the specimen from the left maxillary sinus and left ethmoid sinus was focal granulomatous inflammation with fragments of fungal hyphae compatible with mucormycosis. Liposomal amphotericin B 3 mg/kg/day was continued for 3 weeks, at which time the serum creatinine began to increase, the drug then was decreased to 3 mg/kg every other day.

The follow-up CT scan demonstrated progression of the lesion in the left ethmoid and left sphenoid sinus. Partial left maxillectomy, left ethmoidectomy, and left sphenoidotomy was done and the pathologic diagnosis of the tissue was necrotic tissue with acute and chronic inflammation and focal granuloma with bony involvement. Special stain still revealed fungal hyphae compatible with mucormycosis. Subsequently, rhinoscopic irrigation was done once every one to two weeks. After serum creatinine decreased to baseline in the fourth week, liposomal amphotericin B was then resumed. A total dose of 4.55 g of liposomal amphotericin B was given in six weeks. The serum creatinine was maintained at baseline until the end of treatment. CT scan on the fifth week of treatment demonstrated improvement of the inflammation in the left maxillary and ethmoid sinuses. Mucosal biopsy of the left ethmoid and sphenoid sinuses on the eighth week, i.e. two weeks after discontinuation of the drug, showed chronic inflammation without evidence of fungus in special stain. The patient was well and was discharged after 75 days of hospitalization. She had no relapse during 6 months' follow-up.

Case 2

A 20-year-old woman with systemic lupus erythematosus, and steroid induced diabetes millitus was admitted to Ramathibodi Hospital because of fever and right cheek pain for a week. The patient had active lupus nephritis and had been treated with a high dose of steroids for nearly a year. A week prior to admission, she developed low-grade fever and simultaneously progressive right cheek pain. She had noticed a blood–stained purulent rhinorrhea for the past few days.

On admission, she had a temperature of 38.5°C, tachycardia, mild tachypnea, and blood pressure of 150/100 mmHg. She was slightly pale but not icteric. The right maxillary sinus area was tender. There was no lymphadenopathy. The cardiovascular, respiratory, gastrointestinal, and neurologica l systems were normal.

Laboratory examinations showed a haemoglobin of 9.8 g/dL with normal red blood cell morphology, no leucocytosis. Blood urea nitrogen and creatinine were 40 and 2.3 mg/dL, respectively. The urine analysis showed moderate proteinuria with nephritic sediments. The other laboratory investigations including chest film, blood glucose, liver function test, and serum electrolytes were within the normal range. Anti HIV antibody was negative. Paranasal sinuses radiography showed right maxillary sinusitis. MRI of the orbit and paranasal sinus was diagnostic of chronic pansinusitis, acute right maxillary, right ethmoid and right frontal sinusitis. There was no orbital, cavernous sinus, or intracranial extension.

Sinuscopy of the right maxillary sinus was done with simultaneous biopsy and irrigation. There was mucopurulent content in the sinus with mucosal edema. Wright's stain of the pus revealed a moderate amount of non-septate hyphae. Amphotericin B was started at the dose of 0.5 mg/kg/day because of renal insufficiency and then stepped up to 0.7 and 1 mg/kg/day, respectively. The Caldwell-Luc operation with functional endoscopic sinus surgery (FESS) was performed. The operative findings revealed a blood clot obstructing the right maxillary sinus osteum, edematous mucosa, brownish fluid in the right maxillary sinus, swelling and necrotic tissue in the right ethmoid sinus, and swelling mucosa of the right sphenoid sinus. Pathologic diagnosis of the tissue from the right maxillary and ethmoid sinus was chronic inflammation with fragments of fungal mycelium and granulomatous reaction, compatible with mucormycosis. Amphotericin B was continued to a total dose of 2.29 g over 2 months. Rhinoscopic cleaning was done twice. She was discharged symptom-free.

One week after discharge from the hospital, the patient developed recurrent right cheek pain and fever with rapid progression within a few days. She was re-admitted. MRI of the brain and sinus revealed progression of the lesions in the right frontal and ethmoid sinuses but improvement of the lesion in the right maxillary sinus compared to the previous MRI study. Amphotericin B was re-started at the dose of 1 mg/kg/day. FESS was done and revealed brownish mucoid fluid in the right frontal and maxillary sinuses, swelling of mucosa in the right sphenoid and ethmoid sinuses. Pathologic diagnosis of the nasal mucosa and right maxillary sinus was acute and chronic inflammation with fragments of thin wall broad non-septate fungal hyphae compatible with mucormycosis. Tissue culture for fungus of several specimens yielded no

organisms. Amphotericin B was continued to the total dose of 2.18 g. The follow-up MRI revealed progression of right maxillary sinusitis and unchanged lesions of the other sinuses. Another session of functional endoscopic sinus surgery and revision of right Caldwell-Luc operation was done.

During this 3 months' hospitalization, the patient developed active lupus nephritis. Plasmapheresis was done 10 times as an alternative to immunosuppresive drugs. Liposomal amphotericin B was started at the dose of 1 mg/kg/day and then stepped up to 2 and 4 mg/kg/day. The serum creatinine increased in the second week of medication and was thought to be due to active lupus nephritis rather than drug toxicity. The drug was continued to a total dose of 4.85 g. The serum creatinine returned to baseline after 3 sessions of plasmapheresis. Rhinoscopic examination was done once every one to two weeks, significant improvement was demonstrated. The last tissue biopsy before discharge revealed granulation tissue without evidence of fungus. She was discharged from the hospital in good general condition and was followed-up in the out-patient clinic for a year without clinical relapse.

Case 3

A 72-year-old diabetic woman was admitted to Ramathibodi Hospital because of severe left orbital pain and a swollen left cheek for 2 months. The swelling developed after dental extraction one year previously. In another hospital, aspergillus sinusitis of the left maxillary sinus had been diagnosed by pathologic evidence of a left maxillary sinus tissue biopsy. She was treated with intravenous amphotericin B for a total dose of 800 mg and then switched to itraconazole 200 mg daily due to the rising creatinine. She had taken 200 mg itraconazole daily for nearly a year without relapse of the symptoms until 2 months previously when she had a swollen left eye and left cheek with severe left orbital pain which brought her to Ramathibodi Hospital.

The patient lived in Bangkok. She had had diabetes millitus for 10 years. Her blood glucose was fairly well controlled, but she had diabetic retinopathy and nephropathy with serum creatinine of 1.7 mg/dL.

On admission, the vital signs were normal. She was slightly pale but not icteric. There was proptosis of her left eye with chemosis and tenderness. The extraocular movements of both eyes were full and the pupils reacted normally to light. There was tenderness over the left maxillary sinus. The rest of the physical examination was normal.

Laboratory investigations revealed a haemoglobin of 10.1 g/dL with normal red blood cell morphology, blood glucose of 144 mg/dL, blood urea nitrogen of 21 mg/dL, creatinine of 1.7 mg/dL. Other investigations including chest film, liver function tests and serum electrolytes were within the normal range. Anti HIV antibody was negative.

Sinuscopy of the left maxillary sinus with tissue biopsy was done. There was necrotic tissue in the sinus. The pathologic diagnosis was acute and chronic sinusitis with aspergillosis. CT scan of the paranasal sinuses showed left maxillary sinusitis with intraorbital extension and bony destruction of the sinus wall. MRI of the orbit demonstrated extensive fungal involvement of the left orbit floor and inferior intraconal compartment involving inferior, lateral and medial recti and anterior left cavernous sinus and maxillary bone. A small fungal ball in the left sphenoid sinus was also demonstrated.

Amphotericin B was started with a 1-mg test dose and then 30 mg, and 40 mg on the first and second day, respectively. She had fever with chills in spite of premedication. She needed pethidine to relieve the symptoms. Liposomal amphotericin B was given at a dose of 5 mg/kg/day. She tolerated the drug well.

During the first week of liposomal amphotericin B treatment, left medial maxillectomy, ethmoidectomy, sphenoidotomy and orbital exenteration were performed. The pathologic diagnosis was aspergillosis. Rhinoscopic examination and irrigation was done once every two weeks. The daily 5 mg/kg/day of liposomal amphotericin B was continued. Serum creatinine rose to 2.5 mg/dL after 3 weeks of medication and the dosage was decreased to 3 mg/kg/day. Serum creatinine then returned to baseline within 2 weeks.

The patient was admitted for 91 days and received a total dose of 8.85 g liposomal amphotericin B in 9 weeks. She noticed improvement of symptoms and had a weight gain of 2 kg. The pathologic findings of the left sphenoid sinus tissue biopsy, after 6 weeks of medication, a week after stop medication, and left maxillary sinus tissue biopsy at 2 weeks after stop medication revealed chronic inflammation without fungal mycelia.

At 2 months' follow-up after discharge from the hospital, she had no complaint and need not to take any medication. Rhinoscopy was done and demonstrated a healthy mucosa without necrotic tissue. Left maxillary sinus tissue biopsy revealed only granulation tissue stain.

Case 4

A 59-year-old man came to Ramathibodi Hospital 5 months previously because of left cheek pain and headache for a month. He was a known case of diabetes millitus, hypertension, and had had kidney transplantation 7 years prior. He was on insulin, amlodipine, cyclosporin, and 5 mg/day prednisolone. He had been followed-up in a private hospital.

In Ramathibodi Hospital, chronic left maxillary sinusitis was diagnosed. Left antral irrigation was done and the culture of pus yielded *Aspergillus spp.* MRI of the brain and sinuses revealed an ill-defined inhomogeneous mass in the left Rosenmuller fossa 3.2x2.8x2.2 cm in size with extension into the nasopharyngeal airway, middle cranial dura, left maxillary sinus, bilateral ethmoid and sphenoid sinuses, and left mastoid. There were several areas of lacunar infarction and generalized brain atrophy. Biopsy of the left maxillary sinus and nasopharynx was done and the pathologic diagnosis was acute and chronic maxillary sinusitis with aspergillosis and chronic inflammation of the nasopharynx. Amphotericin B was started at the dose of 0.5 mg/kg/day. Caldwell-Luc operation and simple mastoidectomy with myringotomy and pressure equalization tube insertion were done on the left side. He received a total dose of 0.55 g of amphotericin B before switching to itraconazole 400 mg/day because of the rising creatinine. He was followed-up in a private hospital and itraconazole was discontinued after being taken for 4 weeks because of abnormal liver and renal function. Biopsy of transplanted kidney revealed chronic graft rejection. Two months later, the patient developed recurrent left cheek pain and left sided headache. He was referred back to this hospital.

On admission, the patient looked sick and slightly pale. The temperature, pulse, and respiration were normal. Blood pressure was 210/95 mmHg. The left maxillary sinus was tender. There was no lymphadenopathy. Cardiomegaly with normal heart sounds was found. Examination of respiratory, gastrointestinal, and neurological systems was normal.

Laboratory investigations revealed haemoglobin of 10.3 g/dL with mild hypochromia and microcytosis, blood glucose of 213 mg/dL, blood urea nitrogen of 60 mg/dL, creatinine 1.6 mg/dL. Serum electrolytes and liver function tests were within normal range. The urine analysis showed mild proteinuria. Anti HIV antibody was negative. MRI of the sinus revealed similar abnormalities compared to the previous MRI four months earlier. There was mild progression of bilateral ethmoid and sphenoid sinusitis.

Rhinoscopic examination revealed a few crusts in the left nasal cavity and granulation with minimal necrotic tissue in the left maxillary sinus. The pathological diagnosis of the left maxillary sinus and mastoid was chronic inflammation with fibrosis and granuloma. The eye examination showed stable diabetic retinopathy without evidence of intraocular infection. Because of the high creatinine and invasiveness of the disease, amphotericin B lipid complex (ABLC) was started at a dose of 4 mg/kg/day and decreased to 2 mg/kg/day when serum creatinine rose. Caldwell-Luc operation, left maxillectomy, ethmoidectomy, and radical mastoidectomy were performed. The tissue culture for fungus yielded no organisms. ABLC was given to a total dose of 1.7 g and then switched to liposomal amphotericin B at the dose of 1 mg/kg/day because the former drug was unavailable. Liposomal amphotericin B was continued up to a total dose of 2.8 g. Follow-up MRI of the brain and sinus revealed persistent lesions at the nasopharyngeal area and progression of pansinusitis. Nasopharyngeal curettage was performed and the pathological diagnosis was chronic inflammation, there were no fungal hyphae. Because of poor kidney function and unavailability of liposomal amphotericin B, itraconazole was restarted. During this 3-month hospitalization, the patient developed aspiration pneumonia and secondary bacterial sinusitis of the left maxillary sinus. This was treated successfully with parenteral antibiotics. He was discharged with itraconazole, insulin, amlodipine, cyclosporin, and prednisolone.

Two weeks after discharge from the hospital, he was readmitted because of deteriorating kidney function and volume overload. He was

Table 1. Summary of the 4 cases.

Age, Sex	Underlying Disease	Sinus Involved	Other Organ Involved	Pathologic Diagnosis	Operation	Prior Antifungal Drugs	Liposomal Ampho. B	Outcomes
71, F	DM Renal insufficiency	Lt. Max. Lt. Sphe. Lt. Ethm.	Nose Palate Floor Orbit	Mucormycosis	1. Lt. Denker 2. Lt. Max. & Lt. Ethmoidectomy Sphenoidotomy	Ampho. B 0.05 g	4.55 g 5 mg/kg/D	Good (Disease-free 6 m)
20, F	SLE, lupus nephritis DM, HT	Rt. Max. Rt. Ethm. Rt. Sphe. Rt. Fron.	-	Mucor-Mycosis	1. Rt. CWL, FESS 2. Rt. FESS 3. Rt. R-CWL	Ampho. B 2.29 g + 2.18 g	4.85 g 1, then 2,4 mg/kg/D	Good (Disease-free 12 m)
72, F	DM, Renal insufficiency	Lt. Max. Lt. Sphe.	Lt. Orbit Lt. Cavernous sinus	Aspergillo-sis	1. Lt. Max. & Lt. ethmoidectomy sphenoidotomy Lt. Exenteration	Ampho. B 0.8 g + Itracoz.* + Ampho. B 0.07 g	8.85 g 5, then 3 mg/kg/D	Fair (Stable)
59, M	DM, HT, Post KT & Chronic graft reject	Lt. Max. B. Ethm. B. Sphe.	Nose Nasophar. Lt mastoid Lt. Temperal lobe	Aspergillo-sis (positive culture)	1. Lt. CWL & simple mastoidectomy 2. Lt. R-CWL, max, ethmoidectomy & radical mastoidectomy 3. Craniotomy****	Ampho. B 0.55 g + Itracoz** + ABLC 1.7 g + Itracoz.*** Ampho. B 1.726 g	2.8 g 1 mg/kg/D 2.0 g 3 mg/kg/D	Poor (Dead)

* 200 mg/day for 1 yr.
** 400 mg/day for 1 m.
*** 400 mg/day for 2 wk.
**** removal of brain abscess
Abbreviation: CWL = Caldwell-Luc operation, FESS = functional endoscopic sinus surgery, ABLC = amphotericin B lipid complex

treated with a diuretic with improvement. However, he complained of persistent headache. A neurological examination revealed truncal ataxia, impaired finger to nose and heel to knee test. MRI of the brain and sinus revealed a newly developed rim enhancing lesion at the anterior portion of the right temperal lobe and right cerebellar hemisphere with surrounding edema compatible with fungal abscess. Rhinoscopy was done and showed a dry crust in the left nasal cavity with smooth nasopharyngeal mucosa. Amphotericin B was given at a dose of 0.7 mg/kg/day and serum creatinine was closely monitored. Craniotomy and excision of the brain abscess was done 4 weeks after admission. Examination of a fresh specimen revealed fragments of acute angle branching fungal hyphae but culture was negative. Amphericin B was continued at a low dosage due to high serum creatinine. He received a total dose of 1.726 g in 3 months. An MRI of the brain demonstrated a newly developed non enhancing lesion in the left cerebellar hemisphere, and unchanged pansinusitis. Another total dose of 2 g of Liposomal amphotericin B was retried without success and he died even on medication. Autopsy was not performed.

A summary of the cases is shown in the Table 1.

DISCUSSION

Our four cases of invasive fungal sinusitis were diagnosed according to the new classification and diagnostic criteria proposed by deShazo[18,19]. Sinusitis was confirmed by radiological imaging and histopathological evidence of hyphal forms within sinus mucosa, submucosa, blood vessels, or bone. All cases had underlying diabetes millitus and some also had other additional immunocompromised conditions. Two cases of mucormycosis were diabetics in accordance with most of the reports in the literature[20]. All cases presented with cheek pain and typical clinical findings of sinusitis. The diagnosis of fungal sinusitis in all cases was not

difficult by rhinoscopy, with biopsy and radiologic imaging by CT scan or MRI. The major features of fungal sinusitis as a soft tissue mass in the imaging [21], and bony destruction as a late finding[22] were found in our cases. Awareness of the prevalence of fungal sinusitis in immunocompromised patients should help us in making an early diagnosis and prompt treatment for better clinical outcome.

Surgical resection remains the most important component of the treatment as evidenced by the necessity of multiple operations and mechanical cleaning procedures to remove the fungus in addition to medication. This implies that an extensive surgical debridement should be performed at the earliest stage of the disease for a more successful treatment.

Although amphotericin B is the treatment of choice, its use is limited by its nephrotoxicity and acute febrile reaction especially in the elderly and/or immunocompromised hosts. Liposomal amphotericin B has less toxicity, is tolerated better by the patients and can be given in a much higher dosage in a shorter period of time. We used the same recommended dosage of 3-5 mg/kg/day in treating febrile neutropenia with suspected or proven fungal infection[8,10,12] and cryptococcosis[14]. Even though successful treatment with the dosage of 1 mg/kg/day was reported in one trial[23], most authors do not recommend using such a low dosage since the efficacy may be inferior to equal doses of conventional amphotericin B[15,24].

Treatment of the first two cases of mucormycosis were considered successful and no relapses occurred during 6-12 months follow-up. A 69 per cent successful treatment of sinus mucormycosis has been reported[20]. Result of treatment for aspergillus sinusitis in case 3 was considered fair (stable) due to the chronicity of her illness (> 1 year duration) and the potential relapse of the lesion. The poor clinical outcome in case 4 might be multifactorial including: concurrent immunosuppressive drugs, inadequate surgical resection, inadequate dosage of the drug, and the extensive lesion.

In conclusion, our clinical experience suggests that in addition to complete surgical resection, liposomal amphotericin B is effective in the treatment of invasive fungal sinusitis especially mucormycosis. The drug should be used as an alternative therapy for those who fail to respond or become intolerant to conventional amphotericin B therapy. While the optimal therapeutic dosage has not been established, we believe that a dosage of 3-5 mg/kg/day and a total dose of not less than 4 g is effective. Further investigation is obviously needed.

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ไซนัสอักเสบชนิดลุกลามจากเชื้อรา และการรักษาด้วยไลโปโซมัล แอมโฟเทอริซินบี

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ไซนัสอักเสบชนิดลุกลามจากเชื้อราเป็นสาเหตุของการเจ็บป่วยและการตายที่พบได้บ่อยขึ้น โดยเฉพาะในผู้ป่วยที่มีภูมิคุ้มกันต่ำ แม้ว่าจะได้รับการรักษาที่เหมาะสมด้วยการผ่าตัดและการให้ยาต้านเชื้อรา อัตราการตายยังสูง แอมโฟเทอริซินบีเป็นยาต้านเชื้อราที่เหมาะสม แต่มีข้อจำกัดเนื่องจากพิษต่อไตและปฏิกิริยาจากการให้ยาไลโปโซมัล แอมโฟเทอริซินบีได้รับการยอมรับว่ามีประสิทธิภาพเทียบเท่าแอมโฟเทอริซินบีธรรมดา แต่มีพิษต่อไตและปฏิกิริยาจากการให้ยาน้อยกว่า คณะผู้ศึกษาขอรายงานผู้ป่วยไซนัสอักเสบชนิดลุกลามจากเชื้อราจำนวน 4 ราย ที่ได้รับการรักษาด้วยไลโปโซมัล แอมโฟ-เทอริซินบี หลังจากประสบผลข้างเคียงหรือผลการรักษาไม่ดีจากแอมโฟเทอริซินบีธรรมดา ซึ่งในจำนวน 4 รายนี้ เป็นมิวคอมัยโคซิส 2 ราย และแอสเปอร์จิโลซิส 2 ราย ทุกรายเป็นโรคเบาหวานมาก่อน มี 1 รายที่เป็นโรคเอสแอลอีร่วมด้วย และอีก 1 รายได้รับยากดภูมิคุ้มกันหลังการปลูกถ่ายเปลี่ยนไต ทุกรายได้รับการผ่าตัดไซนัสหลายครั้ง ผู้ป่วยได้รับยาไลโปโซมัล แอมโฟเทอริซินบีเนื่องจากประสบผลข้างเคียงจากการให้แอมโฟเทอริซินบี 2 ราย จากภาวะไตวาย 1 ราย และจากการรักษาไม่ได้ผลด้วยแอมโฟเทอริซินบี 1 ราย ผู้ป่วยทั้งหมดได้รับยาไลโปโซมัล แอมโฟเทอริซินบีรวม 4.55 ถึง 8.85 กรัม พบว่าได้ผลดีในผู้ป่วยที่เป็นมิวคอมัยโคซิส 2 ราย ไม่มีการกลับเป็นซ้ำหลังจากหยุดยาได้ 6–12 เดือน ผู้ป่วยที่เป็นแอสเปอร์จิโลซิสพบว่าอาการดีขึ้น 1 ราย และเสียชีวิตเนื่องจากการลุกลามของเชื้อรา 1 ราย จากการศึกษานี้เห็นว่าการผ่าตัดยังคงเป็นการรักษาหลักในผู้ป่วยเหล่านี้ และไลโปโซมัล แอมโฟเทอริซินบีน่าจะเป็นอีกทางเลือกหนึ่งของการรักษาโดยยาต้านเชื้อราที่ได้ผล อย่างไรก็ตาม ภูมิคุ้มกันของผู้ป่วย พยาธิสภาพ และชนิดของเชื้อรา เป็นปัจจัยที่สำคัญต่อผลการรักษา

คำสำคัญ : ไซนัสอักเสบชนิดลุกลาม, เชื้อรา, การรักษา, ไลโปโซมัล แอมโฟเทอริซินบี

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