

essential when treating patients with anaphylactic sensitivity to latex. To achieve effective avoidance, all potential sources of latex antigens and cross-reactive antigens in hospitals should be considered. Foods known to cross-react with latex antigens, such as bananas, avocados, and chestnuts, should be given to latex-sensitive individuals with great caution.⁶ This case report suggests that pacifier avoidance would be a wise addition to a comprehensive approach to latex antigen avoidance in hospitalized children with anaphylactic sensitivity to latex.

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Amphotericin B: Emergency challenge in a neutropenic, asthmatic patient with fungal sepsis

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Intravenous administration of amphotericin B is the treatment of choice for disseminated fungal infections, but numerous acute and long-term side effects limit its use. Anaphylaxis associated with amphotericin B is quite rare, and no reports, to date, have described an amphotericin B challenge or desensitization in a patient with amphotericin B-induced anaphylaxis. This case report documents a successful amphotericin B challenge and possible desensitization in a patient with acute myelogenous leukemia who was neutropenic, had asthma, and had a prior anaphylactic reaction associated with amphotericin B.

CASE REPORT

A 68-year-old woman with asthma was admitted on July 23, 1993, to the University of South Florida Medical Oncology Service, Tampa, Florida, for systemic chemotherapy of acute myelogenous leukemia, which was diagnosed in May 1992.

She experienced anaphylaxis within 1 hour of receiving an initial intravenous dose of amphotericin B during a 1992 hospitalization; anaphylaxis was manifested by bronchospasm, generalized erythema, rigors, diaphoresis, pruritus, and urticaria. The infusion was discontinued, and the symptoms resolved after she was given intravenous corticosteroids, diphenhydramine, and nebulized albuterol. She received no additional amphotericin B and was given intravenous fluconazole. During treatment with fluconazole, her fever abated and her symptoms resolved.

She was re-admitted to the hospital on July 23, 1993, for additional systemic chemotherapy, and after 5 days neutropenia and fever developed. A fluconazole-resistant strain of *Candida albicans* was isolated from blood, urine, feces, and oral mucosa.

She was transferred to an intensive care unit after she became septic (oral temperature of 103.7° F, tachypnea, tachycardia, delirium, and metabolic acidosis). Ampho-

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TABLE I. Amphotericin B challenge and desensitization protocol

1. Procedure supervised by physician
2. Epinephrine, 1:1000 wt/vol, multidose vial at bedside
3. Premixed albuterol solution at bedside for nebulization
4. Endotracheal intubation supplies at bedside with anesthesiologist on standby
5. Continuous cardiac telemetry with electronic monitoring of blood pressure
6. Continuous pulse oximetry
7. Premedication with methylprednisolone, 60 mg, IV and diphenhydramine, 25 mg, IV
8. Amphotericin B (Fungizone)* administration schedule
 - a. 10^{-6} dilution, infused over 10 min
 - b. 10^{-5} dilution, infused over 10 min
 - c. 10^{-4} dilution, infused over 10 min
 - d. 10^{-3} dilution, infused over 10 min
 - e. 10^{-2} dilution, infused over 10 min
 - f. 10^{-1} dilution (1.0 mg), infused over 30 min
 - g. 30 mg in 250 ml 5% dextrose, infused over 4 hr

IV, Intravenously.

* Mixtures were prepared in 10 ml 5% dextrose by hospital intensive care unit pharmacy, unless otherwise noted.

tericin B was thought to be the best treatment option; however, literature on amphotericin B desensitization could not be located, and a plan for challenge and possible desensitization was developed. Informed consent was obtained from the subject's next of kin.

Allergy skin testing and in vitro determinations of specific IgE antibody were not done because they have not been described. Amphotericin B is known to irritate the skin, and results of skin tests would not be accurate. Challenge with amphotericin B (Fungizone; Adria Pharmaceuticals, Columbus, Ohio) was performed in an intensive care unit as outlined in Table I.

She tolerated the challenge procedure, and her mental activity, temperature, and other vital signs normalized within 6 hours. She continued to tolerate amphotericin B, in daily doses of up to 45 mg (1 mg/kg) depending on renal function, throughout her hospitalization. On September 1, 1993, she died of sepsis caused by *Aspergillus* spp. pneumonia and an amphotericin B-resistant strain of *Candida albicans*.

DISCUSSION

Amphotericin B is used to treat systemic fungal infections; however, its side effects include fever, rigors, headache, nausea, emesis, bronchospasm, phlebitis, hypokalemia, normochromic and normocytic anemia, abnormal renal function, renal tubular acidosis, and anaphylaxis. These side effects limit its use. Continued administration usually

reduces the frequency of fever and rigors, suggesting partial tachyphylaxis.

Allergic reactions to amphotericin B are so rare that one author questioned their existence.¹ However, Murray² reported a single case in which a 72-year-old man received a 1 mg test dose of the drug and experienced acute bronchospasm, fever, and rigors, which subsided after treatment with intravenous diphenhydramine, aminophylline, and hydrocortisone. Premedication with hydrocortisone and diphenhydramine was necessary to prevent recurrence during subsequent doses.²

Lorber et al.³ described a 55-year-old man who had eosinophilia and a generalized, pruritic, maculopapular rash while receiving intravenous amphotericin B. The rash did not improve after treatment with systemic corticosteroids but resolved after the amphotericin B was discontinued. Resumption of amphotericin B administration prompted recurrence of the rash, despite pretreatment with hydrocortisone.³

No information about allergic reactions to amphotericin B has been found in the literature; however, reviews of amphotericin B toxicity have discussed it. Clements and Peacock⁴ retrospectively reviewed charts of 50 inpatients who had received amphotericin B for at least 3 days over a 3-year period. No subjects had experienced bronchospasm or anaphylaxis.⁴

Gigliotti et al.⁵ suggested that prostaglandin E₂ may mediate the fever and chills experienced during amphotericin B administration. Hydrocortisone and ibuprofen, medications that inhibit prostaglandin release, reduced fever and rigors during intravenous administration of amphotericin B in double-blind studies.

The history provided by the subject in this case report suggests that amphotericin B administration caused anaphylaxis. The biochemical composition of amphotericin B is complex, and its antigenic determinants have not been determined. It is unlikely that hypersensitivity to amphotericin B is IgE-mediated because such reactions are rare and the drug is commonly used.

It is not known whether a therapeutic dose of amphotericin B would have caused the same clinical manifestations observed with the previous administration of amphotericin B. The severity of the subject's illness made it undesirable to challenge fully with a therapeutic dose of amphotericin B without first giving incremental challenge doses. The subject's clinical tolerance of the administered amphotericin B made further inpatient evaluation

unnecessary. Elective rechallenge with amphotericin B was also impossible because the subject died.

Amphotericin B challenge is safe and well-tolerated and appears to be effective, as demonstrated in this case report. Avoidance of opiates, which perturb mast cells, and premedication with corticosteroids and antihistamines are recommended.

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Interleukin-5 production by T lymphocytes in atheroembolic disease with hypereosinophilia

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Atheroembolic disease is a consequence of widespread cholesterol microembolization, most often caused by catheterization of a severely atherosclerotic aorta. A transient hypereosinophilia has been reported in up to 80% of the patients; thus, eosinophilia is considered an important clue to the diagnosis of this disorder.¹

Interleukin (IL)-5 is a cytokine secreted by CD4⁺ T cells, mast cells, and eosinophils, which promotes the differentiation and activation of eosinophils.² Indeed, increased production of IL-5 has been demonstrated in several diseases associated with eosinophilia.² In this report we provide evidence that hypereosinophilia associated with

Abbreviations used

IFN- γ :	Interferon- γ
IL:	Interleukin
PBMCs:	Peripheral blood mononuclear cells

atheroembolic disease is related to IL-5 release by activated T cells.

CASE REPORT

A 63-year-old man was admitted to the hospital for treatment of unstable angina 1 week after an acute myocardial infarction. Laboratory findings included moderate renal failure (plasma creatinine, 150 μ mol/L) and normal leukocytosis (9.9×10^9 /L; eosinophils, 3.2%). Angiocardiology performed by femoral puncture (day 0 in Fig. 1) revealed trituncular disease. Ten days later, the patient had accelerated hypertension, mild fever, and leg pain. Livedo reticularis was noted over the abdomen and lower limbs. Renal failure developed (plasma creatinine, 433 μ mol/L on day 23) and blood eosinophilia progressively increased, reaching 3369×10^6 cells/L on day 19 (Fig. 1, A). Immunophenotyping of peripheral blood mononuclear cells (PBMCs) was normal. The cholesterol emboli syndrome was established by renal and skin biopsies. Except for

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