

tered in our two patients. Whether the malformations can be attributed to the same drug used by the two mothers or, to the disease *per se* is difficult to say. However, this drug should not be used during pregnancy and with utmost caution in young women who are likely to conceive because any accident may be disastrous for the fetus.

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## Zygomycosis of Colon

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Zygomycoses (mucormycoses) refers to invasive human fungal infections caused by member of the phylum zygomata. They usually occur in presence of predisposing conditions like diabetes mellitus, lymphomas, leukemias and other immunosuppressed states(1). One third of the patients with zygomycoses have been infants or children. In these malnutrition and concomitant infection have been the most commonly encountered predisposing states(2). Rhinocerebral and cutaneous zygomycoses are the most common forms of infection; and gastrointestinal involvement is infrequently encountered(3). We report here a case of gastrointestinal mucormycoses in a child, perhaps for the first time from this part of the world.

## Case Report

A 14-month-old malnourished child (weight 7.5 kg; expected 10.5 kg) was

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admitted for loose stools with mucous (10-15/day) since three days and generalized seizure and alteration of sensorium since one hour prior to admission. Physical examination revealed signs of moderate dehydration and Grade II coma. Examination of chest, cardiovascular and abdomen were normal. There was no focal neurological deficit.

Initial investigations revealed polymorphonuclear leukocytosis with toxic granules and positive c-reactive protein. He was hyponatremic (serum sodium of 110 mEq/L) and blood urea was 50 mg/dl. Cerebrospinal fluid (CSF) analysis revealed no cells, proteins 30 mg/dl and sugar 84 mg/dl (blood sugar of 112 mg/dl). Blood and CSF clutters for aerobic organisms were sterile. Rectal swab did not reveal any growth of salmonella or shigella.

A clinical diagnosis of acute bacterial colitis with suspected secondary septicemia was made and patient started on intravenous fluids with correction for hyponatremia and parenteral crystalline penicillin and amikacin. After a transient improvement in the stool frequency and general condition on the 3rd day of hospitalization, the child developed abdominal distension and blood and mucus appeared in the stools. A barium enema done to rule out intussusception revealed evidence of frank colitis. The patient continued to be sick and developed acute renal failure characterized by oliguria and azotemia (blood urea of 90 mg/dl and creatinine of 3.2 mg/dl). Antibiotic therapy was changed to cephazolin and amikacin (modified doses), but the patient's condition continued to deteriorate and expired on the 10th day of admission.

On autopsy, the serosal aspect of colon showed patches of fibrinous exudate while the mucosal surface was covered with a dark brown slough and few creamy yellow

flakes of adherent exudate. The terminal ileum showed 3 raised patches of mucosal necrosis 1.5-3 cm in diameter. Rest of the GIT including stomach was normal. Microscopically all sections from large gut and terminal ileum showed extensive mucosal necrosis involving almost entire thickness of mucosa and submucosa. The zygomycetes hyphae were identified as broad branching nonseptate hyphae on hematoxylin and eosin stained sections. Morphological identification was confirmed with Periodic Acid Schieff and Gomori's methenamine stain (*Fig*). Angioinvasion by fungal hyphae was also evident. Thymus was small in size and microscopically showed marked distribution and calcification of Hassal's corpuscles. Splenic white pulp was normal as were small intestinal Peyer's patches. No evidence of disseminated zygomycosis was found. No culture study could be done at autopsy.

### Discussion

Mucormycosis is a rare fungal infection accounting for 10.5% of all mycotic infec-



*Fig.* Cross-section of the colon with GMS stain showing aseptate broad hyphae of zygomycoses with right angled branching.

tion(4). The common clinical presentations are in the form of rhinocerebrally disseminated pulmonary and vascular involvement(3). Gastrointestinal mucormycosis refers to infections localised to the gastrointestinal tract. This is the rarest form of the disease and a review of literature reveals that till date only 87 cases have been described with isolated gastrointestinal involvement(2-9). Thirty one of these (35%) were infants or children. The most frequently involved organs in children were stomach(68%), colon (48%) small bowel(28%) and esophagus(22%). Malnutrition was the commonest predisposing condition present in 50% of all childhood cases(2).

Our case had predominant colonic involvement with minimal involvement of the terminal ileum. Though for a comprehensive diagnosis and identification of zygomycosis both histologic and culture studies are needed: diagnosis usually depends on histologic proof of tissue invasion, as cultures are usually negative and hence unreliable(10). The presence of fungal hyphae in the depth of necrotic mucosa and angioinvasion are adequate histologic evidence to establish pathogenicity in this case. Gastrointestinal disease procedures that result in mucosal alterations or local tissue trauma facilitate the establishment of infection(2). In this case the preceding bacterial colitis and barium enema examination subsequently probably contributed to the occurrence of infection.

In only 2 of the 87 reported cases was an antemortem diagnosis made and that too by preoperative biopsy(2,6). Fever, abdominal pain and/or distension, rectal bleeding and leukocytosis as seen in our case, were the common clinical manifestations that were observed in these cases(6). Unlike other forms of mucormycosis, these

clinical features of gastrointestinal involvement are nonspecific and hence obscured in most cases by the underlying disease. The difficulty in recognizing this infection has resulted in inadequate therapy and a predominantly fatal outcome with only one survivor(2). For an early diagnosis a high index of suspicion should be maintained in infants and children at risk. Cultures of gastric aspirate, stool and blood should be obtained on Sabouraud's media in suspected cases(5). In addition, all children with inflammatory or perforating gastrointestinal lesions should have microscopy and culture of the biopsy specimen. Specific intradermal and complement fixation tests are available but to-date have not been helpful(10). In case the organism is isolated, amphotericin B therapy should be instituted and child monitored for progression of infection. In addition wide surgical excision of the involved area is recommended in case operative complication occurs(2).

Although a rarely reported entity, a number of authors have suggested that these infections are increasing in frequency. In view of the non-specific clinical picture they are often underdiagnosed and hence left untreated. Early diagnosis, by maintaining a high index of suspicion coupled with aggressive surgical and antifungal therapy may help in decreasing the high mortality and morbidity(2).

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## An Unusual Case of Atropine Toxicity

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The use of cycloplegic agents in children may occasionally lead to mild side

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effects. Redness and edema of the eyelids, or mild elevation of body temperature are commonly encountered. The involvement of central nervous system, following a single topical application of 1% atropine sulphate ointment, is a very rare occurrence. We are reporting one such case.

## Case Report

A 3-month-old male infant, weighing, 2.5 kg was hospitalized with sudden abdominal distension, restlessness, abnormal movements, breathing difficulty, irritability, excessive crying, and refusal of feeds of one hour duration. He was born to a 2nd gravida mother, at 30 weeks of gestation and weighed 1000 g. He had septicemia with stage II necrotizing enterocolitis and Stage II retinopathy of prematurity (ROP). The child was on regular follow up. To reassess the progression of ROP, 1% atropine sulphate ointment was applied 1½ h prior to the onset of the presenting symptoms (approximate quantity 0.25 mg/kg of atropine sulphate).

At admission, he was drowsy, febrile and cyanosed. He had tachypnea, respiratory rate (72/min), tachycardia (heart rate 180/min), hot and flushed extremities and fixed dilated pupils. He continued to have generalized tonic clonic convulsions. His abdomen was distended, bladder palpable and bowel sounds absent. Blood counts, ESR and urine examination were normal. Blood culture was sterile and ECG showed sinus tachycardia.

With the above history and temporal relationship to application of atropine ointment, a diagnosis of atropine toxicity was made.

His symptoms were controlled with an intravenous administration of 0.12 mg of neostigmine (physiostigmine was not