CASE REPORT

Disseminated cryptococcosis in an immunocompetent child

R. Godbole · P. Nayar · A. Pradhan · R. Manchanda

Abstract Cryptococcosis is caused by *Cryptococcus neoformans*. Immunosuppression is a predisposing factor for the development of cryptococcosis. However, reports exist that *Cryptococcus neoformans* can cause infection in immunocompetent hosts. We report a case of disseminated cryptococcosis in a 7.5-year-old immunocompetent child.

Keywords Bonemarrow · Fungus yeast

Case report

Clinical History A 7.5-year-old male child came with complaints of low grade fever, cough, breathlessness and weight loss since 2 months. The chest X-ray showed bilateral miliary shadows, so was started on AKT. However, the symptoms worsened even after 2 months of AKT. The parents gave past history of recurrent oral thrush.

On examination, the child had tachycardia, dyspnea, bilateral pedal edema and significant generalised lymphadenopathy. Systemic examination revealed moderate hepatomegaly and splenomegaly. The child was investigated.

Laboratory Investigations

Haemogram: Hb-10.5gm%, WBCcount -9900/cumm, Platelet count -88000/cumm. PBS -Normocytic normochromic RBCs with thrombocytopenia. No abnormal cells seen. Due to thrombocytopenia a bone marrow study was advised.

Bone Marrow Findings: Cellular marrow aspirate smears. Erythroid series: Normoblastic erythropoiesis. Myeloid series: Normal progressive maturation. Megakaryocytes: adequate. There was mild increase in reticulum cells. Few reticulum cells showed foamy cytoplasm and few intracytoplasmic round to oval bodies with budding suggestive of fungal bodies? *Cryptococcus*. No abnormal cells or parasites seen.

Trephine biopsy showed hypercellular marrow spaces. Normal hematopoiesis was replaced by large collections of reticulum cells. These reticulum cells showed large number of intracytoplasmic round to oval bodies which appeared capsulated and few showed budding. These were highly suggestive of *Cryptococcus*. The bodies were PAS-positive and stained positively with silver methanamine.

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Fig. 1 Bone Marrow Aspirate: Reticulum cell showing cryptococci and a budding form. (Leishman stain: 100X)

Fig. 2 Bone Marrow Aspirate: Capsulated fungal bodies-Cryptococci. (Leishman stain; 100X)

Fig. 3 Bone Marrow Aspirate: Reticulum cell containing cryptococci. (PAS Stain; 100X)

Fig. 4 Trephine biopsy showing reticulum cells containing cryptococci. (H & E; 40X)

As bone marrow was involved, we advised further work up such as blood culture, liver biopsy and lymph node FNAC.

Blood Culture: Blood was inoculated on primary isolation media, Saboraud's dextrose agar. The colonies grown were translucent, smooth, gelatinous, mucoid and cream in colour. These colonies were then identified on mini API (Biomérieux) machine as *Cryptococcus neoformans* Var *humicola*. Microscopically, cryptococci are globus to ovoid yeast cells that are capsulated. Cryptococci differ from *Candida* by not forming well developed pseudohyphae. Biochemically, cryptococci are unable to ferment sugars but do assimilate inositol and produce urease.

Liver Biopsy: Normal architecture of liver was effaced and there were large granulomatous collections of multiple

cryptococcal colonies. Special stains like PAS, silver methanamine and mucicarmine were positive.

FNAC of lymph node: Smears showed cryptococcal collections with few budding forms admixed with polymorphs and few lymphocytes on a hemorrhagic background.

CSF examination: Wet preparation showed presence of cryptococci with a few budding forms.

Urine culture: It also showed growth of cryptococcal colonies.

With all this scenario, HIV test by ELISA was suggested which was negative. Then serum immunoglobulins and CD4 and CD8 counts were done. Serum immunoglobulins were on lower side of normal. Absolute CD4 - 461/microltr (N-290-2600/microltr) % CD4 - 22% (N-22%-59%) Ab-

solute CD8 - 508/microltr (N-190-2120/microltr) % CD8 - 24.2% (N-19-48%) CD4/CD8 ratio - 0.90 (N 0.60-2.8)

The patient was then started on amphotericin B, Flucanazole and broad spectrum antibiotics. After 3 weeks of therapy, there was significant clinical improvement and after 7 weeks of hospitalization, the child was discharged.

Discussion

Cryptococcus is an encapsulated yeast. The major environmental sources of cryptococcus neoformans have been shown to be either soil contaminated with pigeon droppings or eucalyptus trees and decaying wood forming hollows in trees [1, 2]. There is, however, no documentation of transmission from animal to human or human to human via the pulmonary route. Cryptococcus neoformans has worldwide distribution and preferentially infects immunosuppressed hosts or patients with AIDS. Worldwide 7–10% of patients with AIDS are affected. AIDS associated cryptococcosis accounts for 50% of all cryptococcal infections reported annually and usually occurs in HIV patients when their CD4 count is below 200/cumm. Human cryptococcosis is endemic in Australia, Papua, New Guinea, parts of Africa, the Mediterranean region, India, Southeast Asia, Mexico, Brazil, Paraguay and Southern California [3]. Lewis and Robinovich in their study found that almost two-third of

the patients with cryptococcal disease were older than 40 years. It was 3 times commoner in men than in women and was rarely seen in children. Reports exist that Cryptococcus Neoformans Var Gatti causes 70–80% of cryptococcal infections occurring in hosts who are immunocompetent [4]. However, to the best of our knowledge, none of the reports pertains to the strain Cryptococcus Neoformans Var Humicolus. Our patient who had disseminated cryptococcosis was immunocompetent.

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