CASE REPORTS

KODAMAEA OHMERI –AN EMERGING FUNGAL PATHOGEN IN NEONATAL INTENSIVE CARE UNIT

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Abstract

A yeast-like fungus *Kodamaea ohmeri* is a very rare cause of fungemia with high mortality especially in immunocompromised patients.We report a rare case of *K.ohmeri* fungemia in a premature neonate which was successfully treated with liposomal amphotericin B. The case emphasizes the need for high index of suspicion and timely intervention to diagnose this fungal infection in septic neonates who are not responding to antibiotictherapy in neonatal intensive care unit (NICU).

Keywords: Kodamaea ohmeri, Preterm, Liposomal Amphotericin B

Introduction

Kodamaea ohmeri although formerly considered a contaminant, is nowregarded not only as disease causing pathogen but an organism responsible for variety of complications in immunocompromised patients. (1) Most of the preterm neonates are immunocompromised, in addition invasive procedures, intubation, prolonged stay on ventilator and antibiotic usage in neonatal intensive care unit (NICU) predisposes them to systemic fungal infections. (1,2) Our literature search till date reveals that there have been only few published cases of newborn fungemia with *K.ohmeri* worldwide and two in India. (2-6) We present a case of neonatal *K.ohmeri* fungemia that responded to liposomal amphotericin B.

Case Report

A 33 weeks preterm male baby was delivered to a healthy immunocompetent mother by a lower segment caesarean section in view of mother having severe pregnancy induced hypertension (PIH). The birth weight of the child was 1.5kg. He had mild respiratory distress on admission to NICUrequiring supplemental oxygen. Umbilical vein was catheterized and he was started on intravenous fluids and intravenous (IV) Cefotaxime and amikacin. The initial septic work up including hemogram, C-reactive protein and blood cultures were negative. During the first week the baby developed sepsis in the form of feed intolerance and severe thrombocytopenia. The 2nd blood culture sent on day 9 of life grew *Klebsiella pneumoniae* sensitive to carbapenems and colistin. Hence umbilical venous line was removed and antibioticswere changed to Meropenem and IV Fluconazole (12mg/kg loading dose followed by 6 mg/kg daily) was also added prophylactically. Even after 48 hours of antibiotics,laboratory and clinical findings showed no improvement. Platelet transfusion and immunoglobulin were given in view of sepsis. Antibiotic was changed to Colistimethate sodium. Inspite of this improvement was very gradual, baby persistently had thrombocytopenia and mild tachypnea. A strong suspicion of fungal septicemia was kept in mind and

a 3rd blood culture was sent on day 18 of life which grew budding yeast cells, and liposomal Amphotericin B was immediately added starting with dose of 1 mg/kg/day and Fluconazole was stopped. Liposomal amphotericin B was preferred over conventional amphotericin B in view of its safety profile and better efficacy. A blood culture done with BioMerrieux BacT/ ALERT Automated microbial detection system using Bact/ALERT FA plus culture bottles, testing was positive for *Kodamaea ohmeri*. Microbiological workup donewith BioMerieux VITEK II compact automated system using Vitek 2 YST card for identification and AST YS06 card for antifungal susceptibility test confirmed the yeast isolate as *Kodamaea ohmeri*. Chrome agar culture of *K.ohmeri* depicted colour change from white to slight pink on extended incubation of more than 48 hours. The sensitivity pattern revealed susceptibility to Amphotericin B (MIC <0.5), caspofungin (MIC<0.25) and Flucytosine (MIC<1) but resistance to fluconazole. Meningitis and endocarditis were ruled out by cerebrospinal fluid (CSF) examination and echocardiography respectively. Ultrasound of brain was normal done on day 5 of life. However the subsequent ultrasound done on day 12 of life was suggestive of grade 1 bilateral germinal matrix hemorrhage which resolved on follow up. Renal parameters and ophthalmic examination were also normal. Within 48 hours of treatment, baby showed clinical and laboratory improvement as shown in table 1, so further microbiological investigations were not performed. Colistimethate sodium and Amphotericin B were continued for 14 days. Repeat blood culture on day 9 of Amphotericin B was sterile. Baby is on regular follow up and doing well without any deficit.

Discussion

Kodamaea ohmeri, formerly known as *Pichia ohmeri* or *Yamadazyma ohmeri*, is a scosporogenic yeast which usually occurs in the haploid state within the family of Saccharomycetaceae. (7) The genus Kodamaea currently comprises five species: *K. anthrophila, K. kakaduensis, K. laetipori, K. nitidulidarum,* and *K. ohmeri.* (8) *Kodamaea ohmeri* is a rare clinical isolate that has recently become known to cause various human infections. This yeast is commonly used in the food industry for its fermentation properties in pickles. (2) Review of literature reveals that immunocompromised state especially with breakdown of the skin mucosal barrier, presence of invasive devices and prematurity are risk factors for this infection. (1,2,4) Very limited cases of *K.Ohmeri* fungemia are known. (2-6)

With recent advance in care of preterm newborns, a significant number of them survive leading to an increase in the prevalence of fungal infections during infancy. All these infections in newborns have taken place in preterm neonates with invasive devices in the form of umbilical venous lines, multiple intravenous injections and in babies who have been on broad spectrum antibiotics like in our case. (2-6) The clinical spectrum in adults range from fungemia to endocarditis, peritonitis, wound infection and phlebitis.(1) However the case reports in newborns have suggested mainly fungemia and one case of tricuspid valve endocarditis with fungemia as the forms of clinical manifestations in neonates. (2-6)

The early identification of fungal infections is crucial for proper treatment. (9) *K.ohmeri* isolate usually exhibits a characteristic color change from pink to blue over a 48-hours period on CHROMagar Candida medium. Lee et al suggested Vitek II in adjunct with chromagar could be immensely helpful for identification of *kodamaea ohmeri*. (3)The new VITEK 2 system is a fully automated system dedicated to the identification and susceptibility testing of microorganisms. In conjunction with the VITEK ID-YST card the VITEK 2 system allows the identification of clinically important yeasts and yeast-like organisms in 15 hours due to a sensitive fluorescence-based technology as in our case. The sequence analysis is useful for a definitive species identification of *K. ohmeri* isolates.(9)

Presently the treatment strategy includes removal of invasive devices and use of effective antifungal therapy. Many studies regarding the susceptibility of Kodamaea to various antifungal therapy have been conducted. (5,6,10) These studies have concluded the superiority

Table 1: Serial laboratory parameters of the patient

Laboratory Parameter	Day 1	Day 3	Day 8	Day 13 (Meropenem started)	Day 15 (Colistin started)	Day 20 (Liposomal Amphotericin B started)	Day 28	Day 35
Hemoglobin (g/dl)	17.1	21.4	21.4	13.4	13	11.5	7.6	10.5
White cell count (cells/cu mm)	12400	14600	7500	6900	13600	12800	11500	14800
Platelets (cells/ cumm)	107000	32000	39000	18000	20000	17000	65000	116000
Serum Creatinine (mg/dl)					0.9		0.5	0.6

of amphotericin B over the azole group of drugs although a dose dependent response may be present with azole group in some isolates. Our neonate was already on fluconazole yet showed no improvement. The addition of liposomal amphotericin B in the treatment regime resulted in clinical and hematological improvement. Lipid formulated amphotericin B has several advantages over conventional amphotericin B, including an increased daily dosage of the parent drug (up to 10-fold), high tissue concentrations in the primary reticuloendothelial organs (lungs, liver, and spleen), a decrease in infusion-related side effects (especially liposomal amphotericin B), and a marked decrease in renal toxicity. The dose ranged from 1mg/kg/day to a maximum of 5mg/day based on the clinical response. (10) Because of high mortality and unawareness of *K.ohmeri*, we recommend early and accurate identification of this potentially fatal pathogen and timely interventions like removal of any implanted device and use of liposomal amphotericin B over 14 days for its complete eradication.

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