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Mini Review Paper

Pneumonia caused by *Candida kefyr* in a Pediatric patient with Acute Lymphoblastic Leukaemia: Case Report

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Abstract

Acute lymphoblastic leukaemia (ALL)is one of the commonest malignancies in children. The disease per se and immunosuppressant cytotoxic drugs administered, together make the patients of ALL very prone to secondary infections. Yeasts recovered from pulmonary tissue are mostly treated as colonisers and left unreported, though they can also be rarely responsible for pneumonia, especially in settings of haematological malignancies. Here we report a case of lung infection due to Candida kefyr in a patient with ALL.

Keywords: ALL, *Candida kefyr*, immunocompromised.

Introduction

Acute leukaemia, a tumour of the haematological progenitor cells of the Bone marrow, is the commonest paediatric malignancy[1]. Of this, Acute Lymphoblastic Leukaemia (ALL) comprises about 75%[1]. The disease commonly presents with neutropenia, which is a risk factor for secondary infections in this group of patients[2]. An absolute neutrophil count of <500/µl has been associated with significant risk of infection[2]. Infect, a patient with febrile neutropenia has a 60% likelihood of being infected[3]. Most of these are bloodstream infections (BSI), although other organs may also be affected[3]. Pulmonary infiltrates develop in about 60-80% such patients, according to scientific literature[4]. Such infiltrates can be due to infection, haemorrhage or leukemic involvement of lung parenchyma[5]. In a study, about 12% of all episodes of infectious pneumonia in ALL are caused by fungi, most commonly by *Aspergillus* spp.[6]. Candida spp. is also a known cause of pneumonia in these patients, although the incidence has decreased due to prophylactic antifungal therapy[7].

Case Report

A 13 year-old male patient presented in the Paediatric outpatient Department of the Medical University with respiratory distress and hepatosplenomegaly. The patient was admitted and baseline haematological investigations were performed. Based on bone marrow analysis, a diagnosis of B cell ALL was achieved. The patient was suffering from cough and breathlessness since 3 months, and also had 2 episodes of haemoptysis. A chest roentgenogram (postero-anterior view) was carried out, which revealed cavitatory lesions in lingular lobe of left lung with patchy fibrosis, along with nodular infiltrates. The total leucocyte count of the patient was 8000/µl and absolute Neutrophil count was 5200/ µl. The patient was put on Tetracycline, Tramadol, Fluconazole, Vincristine, Methotrexate and L-Asparaginase. Sputum sample was collected from the patient and sent to the Department of Microbiology for fungal culture. A 10% KOH smear showed multiple budding yeasts as well as pus cells, with a Quality (Q) score of +3(plus three). Gram stain also showed similar findings. The sample was inoculated in 2 Saboraud's Dextrose agar (SDA) slants and incubated at 37^0C and 25^0C separately. After 48 hours of incubation, opaque, smooth white colonies grew on both tubes. A Lactophenol Cotton blue (LCB) mount of the colonies showed budding yeast cells. A loopful of the growth was streaked onto Corn meal agar by slit inoculation (Dalmau technique) and incubated at 25^0C for 48 hours. Germ tube test and Sugar fermentation and assimilation tests were also performed. The isolate was Germ tube negative and showed elongated budding yeasts and pseudohyphae arranged in irregular parallel bundles (logs in stream appearance) on high power (40X) microscopic examination of the streaked Corn meal agar plate. Glucose, lactose and sucrose were fermented but not maltose. Lactose, glucose and sucrose were assimilated but not maltose. Based on these phenotypic characteristics, the isolate was identified as *Candida kefyr*[8]. Antifungal susceptibility test was done by the disc diffusion technique on Mueller-Hinton agar with 2% glucose and 0.5 µg/ml of Methylene blue, as per CLSI protocol[9]. The yeast isolate was susceptible to fluconazole and voriconazole. The sample was sent on 2 more occasions, which yielded the same results. There was no bacterial growth in the sputum samples. Blood culture on biphasic media was sterile after 21 days of incubation. The patient's breathlessness improved on fluconazole therapy and there were no further bouts of haemoptysis.

Discussion

ALL is the commonest pediatric malignancy worldwide[1]. This haematological malignancy is often complicated by secondary infections, which may be due to neutropenia due to the disease itself or chemotherapy or functional defects of the neutrophils, like defective superoxide production and chemoattraction[2]. Secondary infections in this setting are mostly caused by Gram negative bacilli and *Aspergillus* spp. along with other angioinvasive fungi[3,7]. *Candida* spp. can cause pneumonia in these patients, although primary pulmonary candidiasis is extremely rare and *Candida* spp. isolated from sputum of patients without immunosuppression is mostly treated as commensal or colonisers[10]. *Candida kefyr* is an emerging infectious agent in patients having oncohematological malignancies, being significantly more frequently isolated from oncohematology wards than other wards as reported in some studies[11]. The reason for this preponderance of this pathogen for the immunocompromised host is unknown, although there are speculations that mucositis induced by chemotherapeutic agents may favour its colonisation and infection, and that dietary habits may play a role since this species is mostly found in dairy products[11,12]. Chest X ray in pulmonary candidiasis mainly shows lobar involvement and reticulonodular shadows[11]. Our case is the first report of pneumonia due to this pathogen in a patient with Acute Lymphoblastic Leukaemia and highlights that this yeast species must be considered as a causative agent in infections in haematological malignancies when other aetiologies have been ruled out.

Conclusion

Candida kefyr should be suspected as a possible cause of pneumonia in patients with haematological malignancies and should not be regarded as a mere coloniser. The pathogenic potential of this yeast species needs to be studied further.

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