Septicemia Due to ESBL Producing Klebsiella Pneumoniae in a Multi Transfused Thalassemic Patient with Splenectomy

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Abstract

The spleen plays a major role in the opsonisation of capsulated bacteria. A thalassemic patient is treated with prophylactic antibiotics, vaccines, chelating agents, blood transfusions and many a time, with splenectomy. The surgery predisposes patients to infections with capsulated organisms.Vaccines can prevent occurrence of streptococcal and haemophilus infections to some extent. However Gram negative septicaemia due to capsulated bacteria can be overwhelming in these patients and when caused by multidrug resistant strains can warrant the need for administration of expensive antibiotics to save the life of the patient.

Key words: Thalassemia, Splenectomy, Sceptecimia, ESBLKlebsiella

Introduction

Thalassemia is a heterogeneous group of genetic diseases in which there is a defective synthesis of one or more globin chains. Patients with thalassemia are transfusion dependent and a large proportion of them require splenectomy. Overwhelming sepsis is a recognised complication in these patients. Encapsulated organisms such as Streptococcus pneumoniae and Haemophilus influenzae are the commoner organisms involved [1]. We report a case of a thalassemic chid who had been multitransfused and splenectomised and presented with septicaemia .The isolate was an extended spectrum beta lactamase (ESBL) producing Klebsiella pneumoniae, and this escalated the cost of treatment due to the need for administration of carbapenems.

Case report

A ten year old girl child was admitted to the paediatric ward of JSS hospital Mysore, on the 9th of June 2011 with a history of fever of 5 days duration. The fever was sudden in onset, gradually increasing with no diurnal variation, nor any chills and rigors. There was no history of any associated vomiting, diarrhoea, cold or cough.

The child was febrile on examination, with fever of 104 ^{O}F. The BP was 100/60 mmHg, pulse 110/min; respiratory rate 28/min. Mild icterus and pallor were noted. Multiple pustules suggestive of pyoderma were noted. General physical examination revealed grade 2 protein energy malnutrition (PEM) and mild hepatomegaly.

Past history revealed that the child was a known case of thalassemia major and had undergone splenectomy for the same 3 years back. She had been receiving blood transfusions every month for the last 7 years. She had not received any chelating agents because of financial constraints. The child had received all the scheduled vaccines with the boosters, and in addition, HIB vaccine and pneumococcal vaccine had been administered two weeks prior to splenectomy.

The child was investigated for the possible causes of fever. Blood counts, chest radiogram, liver and kidney function tests, complete blood count, febrile agglutination panel, serology for HIV and Hepatitis and blood culture were done. The investigations revealed haemoglobin of 7 gm/dl, total leukocyte count of 33800/ mm^3 with

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lymphocytosis (Neutrophils -39%, Lymphocytes - 57%, Eosinophils -2%, Metamyelocytes and Promyelocytes 1% each). Total and direct bilirubin were slightly raised at 1.8mg/dl and 0.9mg/dl respectively. Liver enzymes were raised; ALT - 103U/l and AST -92U/l. Serological tests and radiogram did not reveal any significant findings. Kidney function tests were within normal limits.

The child was started on palliative treatment and parenteral amoxyclav (600mg tid) was given but fever persisted. Blood culture done on two consecutive samples yielded the growth of ESBL producing Klebsiella pneumonia. ESBL production was confirmed by disc approximation method. The isolate was however sensitive to meropenem, imipenem and amikacin.Treatment with meropenem was begun immediately and the child recovered dramatically. She was discharged after giving a booster dose of pneumococcal vaccine and also put on penicillin prophylaxis

Discussion

A major long term risk following splenectomy is overwhelming sepsis. In a literature review involving 19680 post splenectomy patients by Bisharat et al (2001) the overall incidence of infection following splenectomy was 3.2% with a mortality rate of 1.4%. Of these, the incidence was highest in patients with thalassemia major (8.2%). The mortality rate in this group was also higher (5.1%) [2]. Not surprisingly the mortality rate was higher in the paediatric population.

Though encapsulated organisms like Streptococcus pneumonia and Heamophilus influenzae are more commonly involved, there is increasing evidence for overwhelming sepsis due to Gram negative bacilli. A possible explanation is that vaccination and antibiotic prophylaxis may prevent the occurrence of streptococcal and haemophilus infections. Ghosh et al reviewed a series of 46 thalassemic patients who had undergone splenectomy, and among this group, infections were caused by Gram negative bacilli such as Klebsiella, Pseudomonas, Aeromonas and Campylobacter [3]. In another study by Ejstrud et al, of 539 splenectomised patients, enterobacteria were the predominant organisms causing infections[4].

Klebsiella pneumoniae was isolated from our patient, and the isolate turned out to be multidrug resistant. Patient did not respond to the parenteral treatment with amoxyclav that was started before the susceptibility results were available. Though the child had received almost all necessary vaccines, ESBL klebsiella playing truant was a paradox of misfortune and need arose for administration of expensive medication in the form of carbapenem antibiotic, significantly escalating the cost of management. As the risk of overwhelming infections is life-long in these patients, measures should be taken to keep its occurrence to a minimum. Certain reports recommend re-vaccination with polyvalent pneumococcal vaccine after three years [5]. Others have suggested administration of intravenous immunog-lobulins[2]. Although these measures may be required for over-all management, vigilance and prompt treatment can be life-saving.

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