

Case Series

Blood Culture – A must and of Utmost Importance In Medical Intensive Care Wards

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Abstract

Gram negative bacterial infection is the most common cause of sepsis and related syndromes. Polymicrobial etiology of sepsis is also known. Blood cultures yield bacteria or fungi in only 20-40% of cases of severe sepsis and in 40 -70% of cases of septic shock. Blood cultures should be given prime importance in identifying the nature & in determining the possible source of infection. Cultures are of extreme importance in identifying the source of infection, more so in Geriatric population & immunocompromised patient. The importance of blood culture in identifying & treating the causative agent in cases with varied presentation is explained in the case report. Importance of blood culture in determining the causative agent & in initiating appropriate antibiotic therapy to overcome drug resistance is of utmost importance.

key words: Blood culture, Diabetes, Immunocompromised.

Introduction

Gram negative bacterial infection is the most common cause of sepsis and related syndromes. Polymicrobial aetiology of sepsis has also been described. Septic shock can occur due to falciparum malaria, enteric fever, dengue fever & other infections¹. Blood cultures yield bacteria or fungi in only 20 -40% of cases of severe sepsis and 40 -70% of cases of septic shock. Individual gram negative or gram positive bacteria account for 70% of the isolates⁽¹⁾. The clinical manifestations of sepsis result as a consequence of the complex interplay among the immune, coagulation, and the neuroendocrine systems in response to severe infection⁽²⁾. These manifestations overlap the signs & symptoms due to the underlying medical conditions and primary site of infection. We present to you two interesting cases of Septicaemia having varied presentations.

Case Report

Case 1: A 75 year old female patient, a known Diabetic and Hypertensive presented with complaints of four episodes of vomiting in one day and decreased level of consciousness four hours prior to admission. At admission her pulse rate was 110/ min & BP was 120/80

mm of Hg. Examination of CVS & RS , abdomen normal. She was drowsy, arousable. Responsive to verbal commands with no focal neurological deficits. Blood & urine cultures were taken in emergency room prior to initiation of antibiotics. All other investigations – complete blood counts, renal function tests, electrolytes, liver function tests, chest X ray were done. Her total counts at admission were 31,100 cells /mm³ with neutrophilic predominance of 86%. Blood urea – 82 mg/dl and Serum Creatinine was 2.0 mg/dl. Serum sodium was 125 mEq/L. Random blood sugar was 618mg/dl. She was empirically started on higher antibiotics. Blood & urine cultures yielded *Escherichia coli* which were sensitive to Amikacin, Imipenem, Meropenem, Ertapenem, Chloramphenicol & Gentamicin. She was treated with IV antibiotics for 2 weeks. Complete blood counts & Renal function tests were repeated and were found to be normal at the time of discharge.

Case 2: A 38 year old male patient, a chronic alcoholic of 15 years duration presented to emergency

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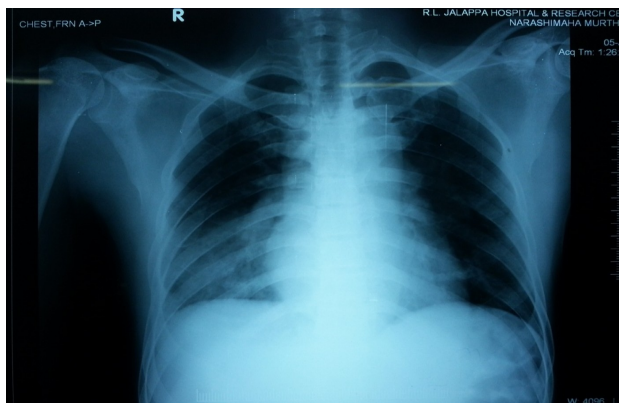


Fig -1: X ray illustrated on Day 1

room with h/o of Generalised weakness of 15 days duration, fever & decreased level of consciousness of 2 days duration. He was not a known Diabetic or Hypertensive. At the time of admission pulse rate was 112/min, BP was 110/ 80 mm of Hg, RR – 32 cycles/min. Spo2 was 86% with 6 litres of oxygen/min. On examination CVS – Tachycardia, RS – Bronchovesicular breath sounds over right basal areas, PA – Soft without any organomegaly. CNS – Drowsy & in altered Sensorium.

A provisional diagnosis of Right Basal Pneumonia was made and all the necessary investigations – Complete blood counts, chest x ray, ABG, Renal function tests, Electrolytes, Liver function Tests, Sputum & Blood culture tests were sent. His total counts at the time of admission 8,700 cells/mm³ with neutrophilic predominance of 74%. Blood culture yielded extended spectrum beta lactam positive klebsiella pneumonia sensitive to Amikacin, Gentamicin, Chloramphenicol, ciprofloxacin, Levofloxacin, piperacillin & tazobactam, Imipenem & meropenem.



Fig -2: X ray illustrated on Day 5

Discussion

Blood culture plays an integral role in the evaluation of sepsis. Blood culture should be given prime importance in identifying the nature of infection & in determining the possible source of infection. A positive blood culture indicative of bacteremia in combination with other cultures such as sputum, urine, stool, pus would immensely benefit the treating clinician in identifying the primary source of infection in absence of a specifying localising sign.

Indications for blood culture

1. Clinical features of sepsis including tachycardia, tachypnoea, increased or sub-normal temperature and change in sensorium, hypotension or prostration.
2. Suspicion of infective endocarditis.
3. Pyrexia of unknown origin.
4. Unexplained leucocytosis or leucopenia.
5. Systemic and localised infections including suspected meningitis, osteomyelitis, septic arthritis, acute untreated bacterial pneumonia or other possible bacterial infection.³

Cultures are of extreme importance in identifying the source of infection, more so in Geriatric population & immunocompromised patient. Recognition of sepsis & related syndromes in elderly patients is a diagnostic challenge because infections can present in the elderly in unusual ways. Published data support the view that the diagnostic yield of blood cultures in elderly patients with bacteremia is similar to that observed in young individuals.⁵ A study conducted in afebrile geriatric patients found bacteremia-fungemia and diagnosis was correctly made in only one third of the patients, after blood cultures were drawn, and almost one half were already receiving antibiotics.⁶ By mentioning the above patients, we emphasise the importance of blood culture in determining the causative agent & in initiating appropriate antibiotic therapy to overcome the overwhelming drug resistance in developing countries.

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