Case Report

An unusual pathogen in a case of community acquired pneumonia

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Abstract

Staphylococcus epidermidis, so far thought of primarily as a harmless commensal bacteria on human skin, is now recognized as a significant opportunistic pathogen. It generally causes nosocomial infections at a rate that is comparable to that of its relative, the more virulent Staphylococcus aureus. Even though S. epidermidis infections seldom result in life-threatening illnesses, the frequency and difficulty of treating them place a significant strain on the public health system. Our case describes the case of a healthy adolescent with no known risk factors who developed S.epidermidis pneumonia and was subsequently managed with antibiotics to full recovery

Keywords: Community acquired pneumonia, healthy adolescent, Staphylococcus epidermidis.

Introduction

Staphylococcus epidermidis (S. epidermidis) is one of the most common nosocomial opportunistic pathogens and is commonly associated with infections of foreign devices like indwelling catheters and tubes.[1] S. epidermidis is also the most common etiologic agent of nosocomial bacteremia in children, particularly in the neonatal intensive care unit, and a common etiological agent of health-related bacteremia in patients of all ages.[2] In addition, prosthetic valve endocarditis, central venous line infection, and cerebrospinal fluid shunt meningitis are also associated with S. epidermis. Although a few community-acquired S. epidermidis infections in immunocompetent children have been reported, the etiology is unknown.[3] "No recent study has described S. epidermidis as a causative agent of pneumonia. Although the information is limited and S. epidermidis infection is often underdiagnosed or misdiagnosed due to specimen contamination, it seems clear that the general prevalence of S. epidermidis in pleural fluids in the absence of a chest drainage tube is extremely rare. Although few cases of urinary tract infection (UTI) attributable to S. epidermidis have been reported, to the best of our knowledge, this is the first reported case of organism isolation from a pleural effusion in a patient with pneumonia without known risk factors.

Case Report

A 12-year-old male patient presented in our department with chief complaints of cough and fever for the last 7 days. Cough was associated with mucoid expectoration, without any hemoptysis or positional variation. Fever was of high grade, without any chills and rigor, reduced only on taking antipyretics. Bowel and bladder functions were within normal limits. On further inquiry, past history, family history, and birth history were unremarkable. On examination, vitals were within normal limits, except the patient was febrile.Axillary temerature was 39°C.Respiratory system examination revealed, reduced vesicular breath sound in the both infra-axillary, infra-scapular, and infra-clavicular areas, and left the infra-axillary area. There were fine crepts over both infra-scapular and infra-axillary areas.

Routine blood investigations revealed leucocytosis. Radiography at the emergency reception revealed opacities in the mid and lower zones on both sides, with air bronchograms. Similar findings were seen after the patient underwent an HRCT thorax. There was no associated lymphadenopathy or cavities. Total Leucocyte Count (TLC) on admission was 15500/microlitre. On USG screening, mild pleural effusion was noted, which was aspirated and sent for culture and sensitivity. Subsequently, it showed the growth of staphylococcus epidermidis (10^6 Colony Forming Units/ml). Sputum gram stain

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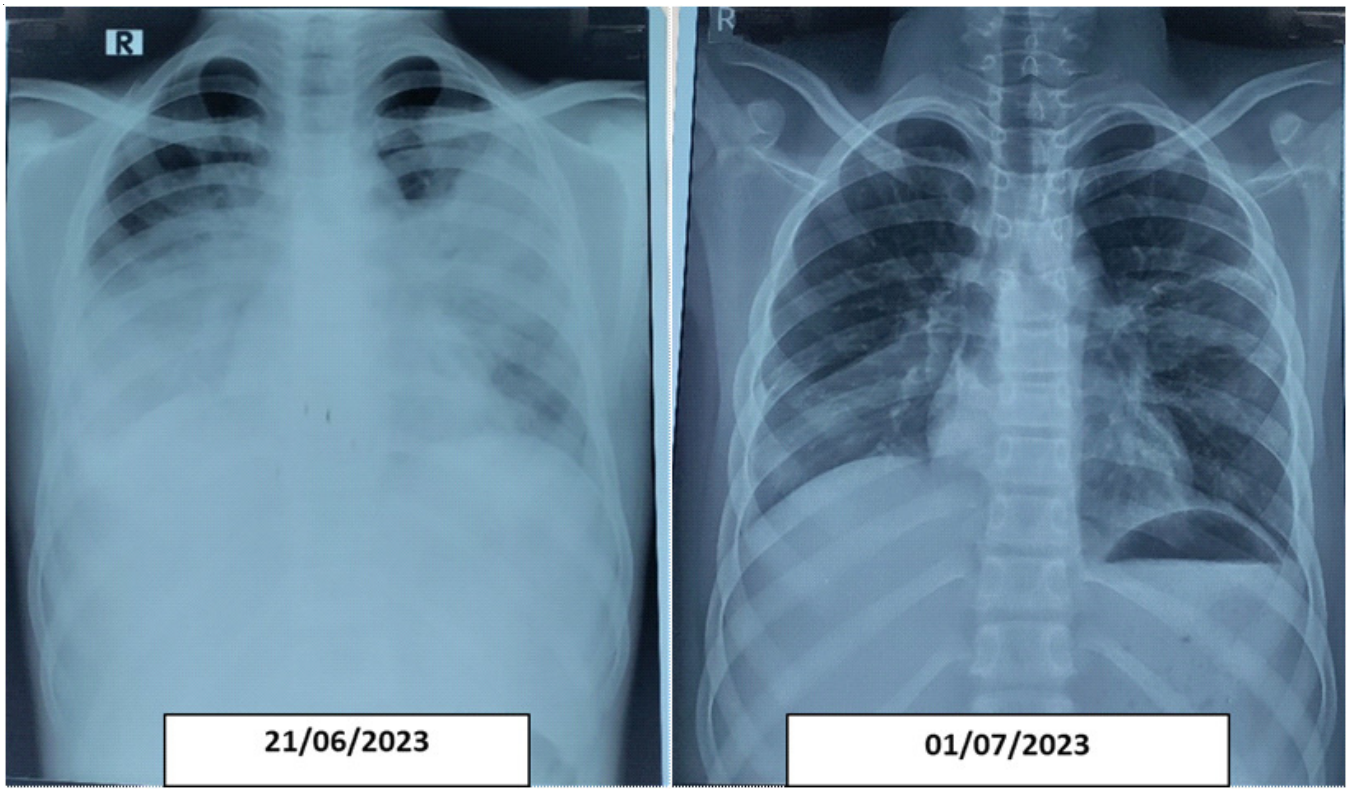

Figure 1 – Serial radiographs on day 1 and day 11 showing the consolidation in both the lung fields and subsequent clearing respectively

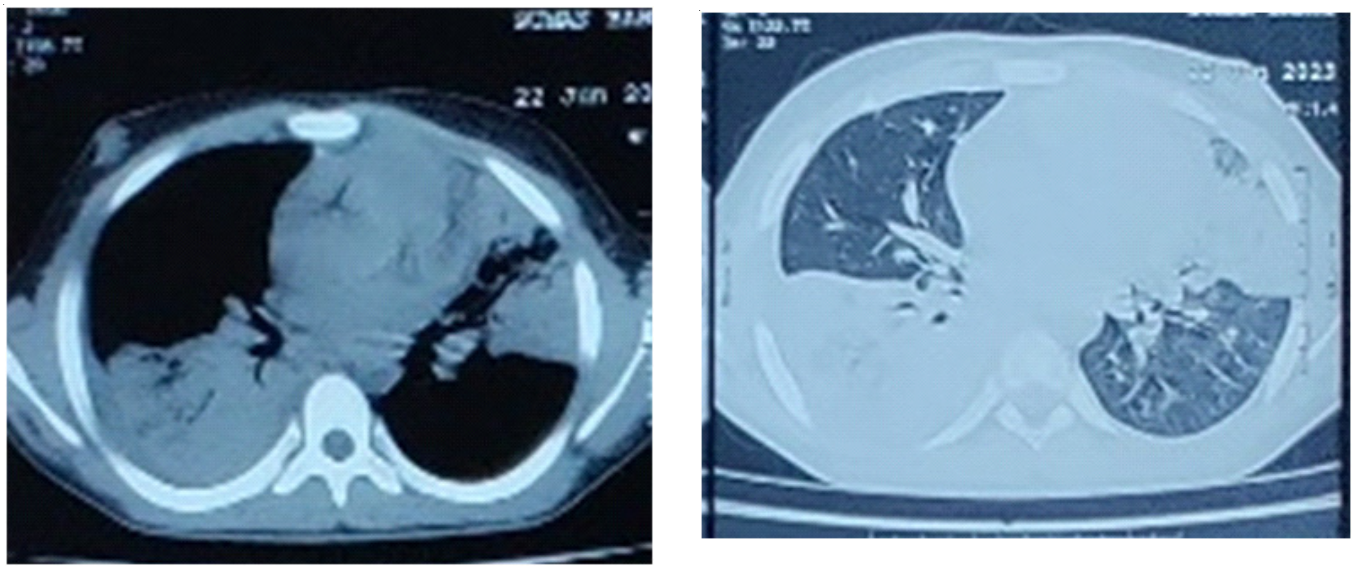

Figure 2: CT scan chest done after admission showing consolidation with air bronchograms

revealed no growth of any bacteria, blood viral profile was also found to be negative. Antibiotic sensitivity testing revealed resistance to Vancomycin and Cephalosporin group of antibiotics and sensitivity to Methicillin, Linezolid, and Tigecycline.

The patient was treated conservatively with antipyretics and antibiotics. Serial radiographs revealed clearing of the lung fields. The inflammatory markers including TLC revealed a declining trend and normalized by day 14 post-admission.There was a near complete radiological resolution by day 14. On day 15the child was discharged in hemodynamically stable condition.

Discussion

S. epidermidis frequently causes infections linked to lines and tubes like peritoneal dialysis catheters, prosthetic heart valves,

cerebrospinal fluid shunts, and indwelling central venous catheters. S. epidermidis is frequently regarded as a contaminant when isolated from the blood or bodily fluids of individuals without predisposing conditions. S. epidermidis urinary tract infections are frequently linked to urinary tract instrumentation in a hospital setting, especially in infants in the neonatal critical care unit.[1,2,3]

Its natural niche on human skin provides ready access to any device inserted or implanted across the skin.The organism also has the ability to adhere to biomaterials and form a biofilm which makes S.epidermidis a successful pathogenic organism during instrumentation and immunosuppression.[3]

Previously, few reports of community-acquired UTI and pyelonephritis caused by S.epidermidis have been reportd in the literature, both with and without preexisting risk factors.[4,5,6] However, there is no such report of S.epidermidis as a causative agent for pneumonia. S.epidermidis as the causative organism in our case is further supported by the fact that treatment of our patients with antibiotics profile sensitive for the isolated organisms resulted in complete clinical, radiological, and hematological resolution.

What makes our case more interesting is the absence of any risk factors like urinary catheters or central lines. In the absence of these known risk factors cases of reported S.epidermidis infection are only a handful.

There has been growing concern over antibiotic resistance of S.epidermidis isolates. Eladli et al in 2019 reported that in S. epidermidis strains isolated from patients in the Riyadh region Fosfomycin, amoxicillin/clavulanic acid, imipenem, linezolid, and oxacillin resistance were detected in more than 80% of the isolates. 100% of the S. epidermidis strains isolated from healthy students were resistant to benzylpenicillin and fosfomycin, and more than 50% were resistant to erythromycin, clindamycin, tetracycline, and fusidic acid. Conversely, 100% of the S. epidermidis strains were susceptible to gentamicin, levofloxacin, moxifloxacin, tigecycline, and trimethoprim/sulfamethoxazole.[7]

Chabi et al,[8] in 2019 reported S. epidermidis strains harbored the highest prevalence of resistance against penicillin (95.65%), tetracycline (91.30%), erythromycin (82.60%), cefazolin (78.26%), and trimethoprim-sulfamethoxazole (73.91%). In our case there was resistance to Vancomycin and Cephalosporin group of drugs.

The necessity for responsible use of antimicrobial drugs and the significance of antimicrobial stewardship is highlighted by S. epidermidis species growing resistance to many antimicrobial medicines that are currently thought of as first-line treatments for S. epidermidis infections. Local epidemiological monitoring data and individual antimicrobial susceptibility test findings for each patient's isolates should be used to inform treatment decisions.

To avoid S. epidermidis infections, it is essential to consistently follow the recommended infection prevention and control procedures, especially when inserting and using medical equipment. For the best therapy of S. epidermidis infections, more information from antimicrobial susceptibility testing against newer antimicrobial drugs with action against S. epidermidis and improved evaluation of their efficacy is required.[9]

Conclusion

S.epidermidis is a common nosocomial pathogen associated with infection of lines and tubes in hospital settings.Although sometimes isolated in specimens, the validity of the organism as a causative agent remains unclear due to frequent contamination of samples.However recently some reports are emerging from world medical literature regarding S.epidemidis being confirmed as the causative agent in community-acquired UTIs and several infections and patients responding to treatment as per the antibiotic sensitivity profile of the isolated organism.Hence in a case of community-acquired pneumonia if S.epidermidis is isolated from the biological sample it may be prudent that the clinician may treat the patient as per the antibiotic sensitivity profile of the same

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