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Chryseobacterium Indologenes causing Necrotizing Pneumonia in a patient with end stage renal disease: A case report.

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Abstract: *Chryseobacterium indologenes* is an uncommon emerging human pathogen usually because different forms of diseases in hospitalized immunocompromised patients. We report a case of young female patient with end stage renal (ESRD) disease developed severs necrotizing pneumonia because of *C. indologenes.* We conclude this is, to the best of our knowledge, the first case repot of necrotizing pneumonia due to *C. indologenes*, a rare disease agent with low pathogenicity but capable of causing severe illness especially in immunocompromised patients.
Keywords: *Chryseobacterium indologenes* , human pathogen, end stage renal disease (ESRD).

INTRODUCTION

Chryseobacterium indologenes, formerly known as *Flavobacterium indologenes*, or *Flavobacterium aureum*, belongs to CDC group IIb. It is non-motile, catalase-positive, oxidase-positive, indole-positive, non-glucose-fermenting Gram-negative bacilli [1]. C indologenes is a rare pathogen in humans and is not normally present in the human microflora although it is widely distributed in nature [2]. However, the clinical significance of *C. indologenes* has not been fully established because this bacterium is not frequently recovered from clinical specimens [2]. In 1993 the first *C. indologenes* strain was isolated from the tracheal aspirate of a patient with ventilator-associated pneumonia, although this organism pathogenicity was not clear. Nevertheless, it is already known that biofilm and proteases production are important mechanisms involved in the pathogenesis [3]. However, sparse cases reports are reported both in children and adults. The associated infections involve the blood stream, pneumonia, intra-abdominal and surgical wounds and the main comorbidities are diabetes mellitus and oncological diseases [3-6].

We report a case of young female patient with end stage renal disease (ESRD) on haemodialysis developed sever hospital acquired necrotizing pneumonia due to *C. indologenes*, to the best of our knowledge this is the first case of necrotizing pneumonia reported with this emerging pathogen.

A CASE REPORT

A 25 years old female with end stage renal disease (ESRD) on regular haemodialysis presented to ER at King Abduaziz Medical City –Riyadh in November 2014, complaining of productive cough, shortness of breath and fever for five days. On clinical examination she looks unwell, febrile with Temperature (Temp) of 38.9 C, blood Pressure(BP) 155/77, respiratory rate (RR) was 24/min, heart rate(PR) was 120/min, oxygen saturation was 98% she was fully conscious and oriented , she was diagnosed as a case of community acquired pneumonia and she received empirical intravenous antibiotics (Ceftriaxone) and oral Azithromycin . Chest-XR was done and showed evidence of patchy opacities involving both lungs more in the right middle and lower lung zones (Figure1) , in the same day of admission she being unstable with increasing of shortness of breath and low oxygen saturation, she transferred to intensive care unit(ICU) immediately due to respiratory failure. In the third day of admission sputum and blood cultures showed growth of methicillin susceptible staphylococcus aureus and she received intravenous Flucloxacillin. After three days in ICU she was improved and transferred to the word in a good condition. One week after discharged to the word she started to developed fever, cough again; chest-XR and septic screening were done with suspension of hospital acquired pneumonia. She complained of left side chest pain which increased to be severing over the time, unfortunately after two days she developed sever respiratory distress and required ICU admission with endotracheal intubation. Chest X-Ray showed bilateral infiltration more in the right side and pleural effusion (Figure2). Chest Computed tomography scan (CT scan) revealed diffuse right lung opacity keeping with pneumonia, bilateral pleural effusion small amount in the right side and moderate and loculated in the left side and also cavity lesion in the left lower lung (Figue3 A and B). Surgical pathology report of specimens from left upper and left lower lobes and pleural debris showed organizing fibro purulent exudation of pleura with organizing acute interstitial pneumonitis and segments of infract lung

tissue. Respiratory cultures (Sputum and tracheal aspirate) were done twice and lung tiusse were showed growth of *C. Indologenes* which was sensitive to (cefepime, ciprofloxacin and bactrim) , resistant to (imipenem , meropenem , piperacilin/ tazobactam , amikacin and gentamycin) and intermediate to Ceftazidime. Successful thoracotomy was done with left upper and lower wedge resection and chest tube inserted for patient. She received combination of Trimethoprim-sulfamethoxazole and Ciprofloxacin intravenously for total of three weeks. pt discharged from Hospital in a good condition after 41 days of admission and her chest XR showed good improvement (Figure4).

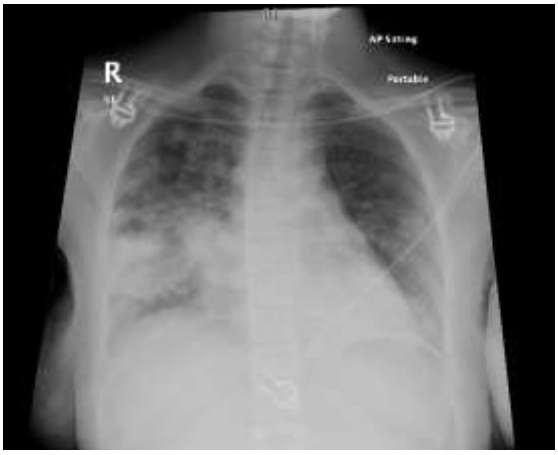

Figure 1: Chest X-Ray (PA) showing evidence of patchy opacities involving both lungs more in the right middle and lower lung zones

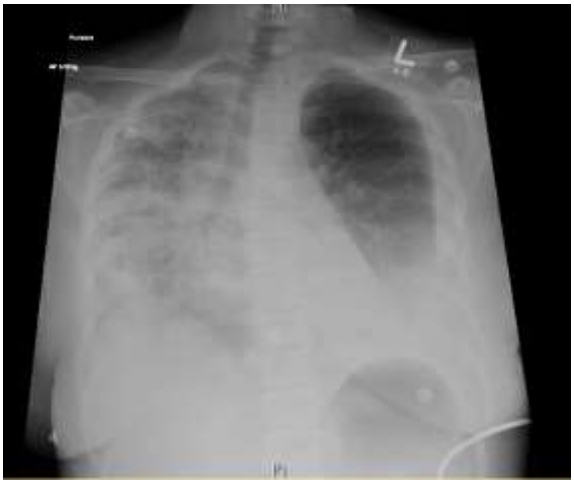

Figure 2 : Chest X-Ray(PA) showing bilateral infiltration more in the right side and bilateral pleural effusion

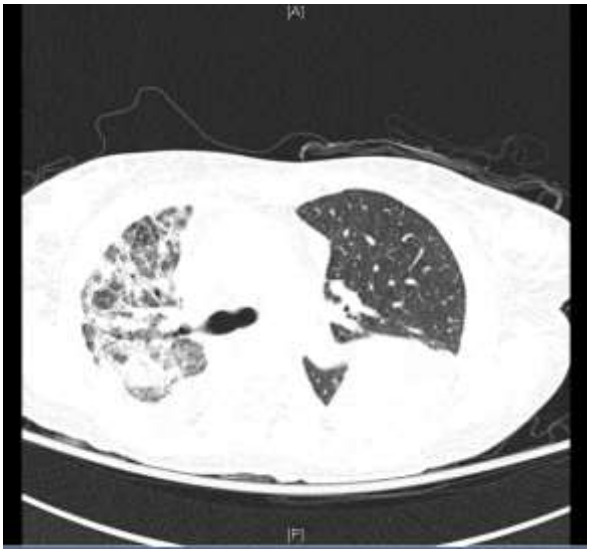

Figure 3A: Chest Computed tomography scan (CT scan) showing diffuse right lung opacity, bilateral pleural effusion small amount in the right side and moderate and loculated in the left side and also cavity lesion in the left lower lung

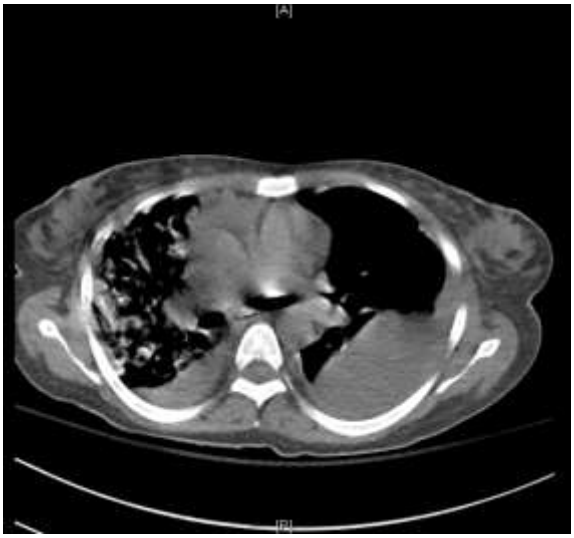

Figure 3B: Chest Computed tomography scan (CT scan) showing diffuse right lung opacity, bilateral pleural effusion small amount in the right side and moderate and loculated in the left side and also cavity lesion in the left lower lung

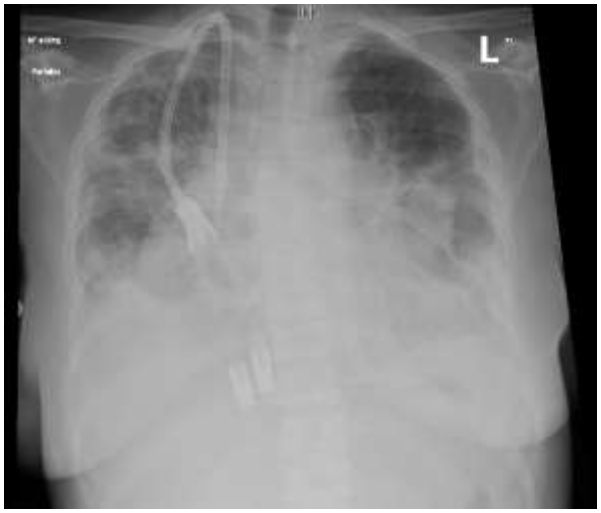

Figure 4: chest X-Ray showing good improvement of bilateral lung patchy opacities and right side heart central line

DISCUSSION

Necrotizing pneumonia is a morbid and potentially fatal complication of pulmonary infection characterized by progressive necrosis of lung parenchyma. Most common causative organisms are bacteria, including *Staphylococcus aureus, Streptococcus pneumonia* and *Klebsiella pneumoniae. Pseudomonas aeruginosa*, *Haemophilus influenzae*, *Escherichia coli*, *Acinetobacter baumannii*, and anaerobic pathogens have also been reported to cause necrotizing pneumonia [7, 8]. *C. indologenes* was not mentioned before as a cause of necrotizing pneumonia up to our knowledge.

C. indologenes is widely distributed in nature but is a rare human pathogen. It has been isolated from clinical specimens but rarely from blood3 and has been shown to cause a variety of invasive infections, such as primary bacteremia, catheter-related bacteremia, wound sepsis, cellulitis, pyonephrosis, peritonitis, biliary tract infection and ventilator-associated pneumonia [3, 9]. In the hospital environment, it is frequently recovered from wet surfaces and water systems by virtue of its ability to contaminate and persist in fluid-containing apparatuses [9].

In the literature, most cases of *C. indologenes* bacteremia were detected in hospitalized patients with a severe underlying disease, such as malignancies or diabetes mellitus, or indwelling devices(3)(9). Our patient was on haemodialysis due to ESRD, which may be a risk factor and she acquired infection during hospital admission. This finding was consistent with the literature that most cases of C. indologenes infections were due to nosocomial infection [3, 9, 10].

Antimicrobial susceptibility data on *Chryseobacterium spp*. remain very limited because this pathogen has rarely been isolated from clinical specimens. The results of the evaluation of a worldwide collection from 1997-2001 indicate that the newer quinolones (garenoxacin, gatifloxacin, and levofloxacin) may represent the most appropriate antimicrobial agents to treat infections caused by this pathogen [11]. Garenoxacin was the most active quinolone (minimum inhibitory concentration required to inhibit the growth of 50% of organisms (MIC50): 0.12 μg/mL); gatifloxacin (MIC50: 0.25 μg/mL) and levofloxacin (MIC50: 0.5 μg/mL) also inhibited 98.0% of the isolates, and the rate of susceptibility to ciprofloxacin (MIC50: 0.5 μg/mL) was significantly lower. Trimethoprim-sulfamethoxazole showed reasonable activity. Among the β-lactams, the most active agents overall were piperacillin-tazobactam (MIC50: 4 μg/mL; 80.0% susceptibility), piperacillin (MIC50: 8 μg/mL; 74.0% susceptibility), and cefepime (MIC50: 8 μg/mL; 62.0% susceptibility). The carbapenems (6% to 12% susceptible) and the aminoglycosides (8% to 14% susceptible) exhibited poor activity against these pathogens [11]. In other study for *Fu-Lun Chen*, 215 C. indologenes isolates between January 1, 2004 and September 30, 2011 in a centre in Taiwan, The results of in vitro susceptibility tests of 16 antimicrobial agents are shown in Tables 2 and 3. TMP-SMZ was the most active agent, followed by cefperazone-sulbactam. A total of six strains of C indologenes isolated from wound and cerebrospinal fluid were all susceptible (100%) to TMP-SMZ. However, only two wound isolates were susceptible to cefoperazone-sulbactam, and only one wound isolate was susceptible to ciprofloxacin and levofloxacin.There is a poor response to carbapenem and pipracilln-tazobazctam [1]. C. indologenes isolated from our patient was sensitive to Cefepime, ciprofloxacin and Bactrim and intermediate to ceftazidime and it was resistant to imipenem, meropenem , piperacilin/ tazobactam , amikacin and gentamycin.

CONCLUSION

C. indologenes, a rare disease agent with low pathogenicity but capable of causing severe illness and being a potential pathogen especially in immunocompromised patients.

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