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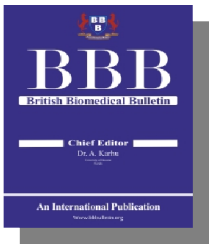

Case Report

Chryseobacterium indologenes Associated Urinary Tract Infection – A Case Report

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A R T I C L E I N F O

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A B S T R A C T

Introduction: *Chryseobacterium indologenes, a* non-fermentative Gram negative bacillus, is an uncommon pathogen in humans. It causes a variety of invasive infections especially in hospitalized patients with severe underlying disease and with indwelling devices.
Case Report: A 21 year old, primigravida with 39.6 weeks of gestation, underwent induced labour with vaccum assisted delivery for intrauterine foetal death. She was catheterized for 24 hrs, after which she developed fever spike. The patient was started on Ciprofloxacin empirically. Urine culture was positive for multidrug resistant *C. indologenes*. The strain was sensitive only to Tetracycline, Tigecycline and Co-trimoxazole. The antibiotic was changed to Tigecycline to which she responded clinically.
Conclusion: *Chryseobacterium indologenes*, though a rare pathogen has gained importance because of its multidrug resistant nature. Appropriate management warrants accurate identification and antimicrobial susceptibility testing.

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Introduction

Chryseobacteria are a group of Gram negative, non-fermenting, nonmotile, catalase, and oxidase positive aerobic bacilli. Although *Chryseobacterium meningosepticum* is the most pathogenic of the genus, *Chryseobacterium indologenes* (*C. indologenes*) is the species most commonly reported in association with different clinical syndromes especially in patients with various indwelling devices and in immunocompromised patients.[1] It forms biofilms and produces a protease that may be important in its virulence. *C. indologenes* is found in soil, plants, food, fresh water, salt water and drinking water (it resists chlorination), but despite its extensive distribution in nature, it is not a part of the normal human microflora. In hospitals, it is isolated in water systems, surfaces of equipment and humid medical supplies (ventilators, tubes, humidifiers and others).[2, 3]

There is scarcity of data in the Indian literature regarding infections by *Chryseobacterium species,* mainly *C. indologenes*.[4] Here, we report a case of urinary tract infection (UTI) by *C. indologenes* in a woman who had undergone induced labor following intrauterine fetal death (IUFD).

Case Report

A 21-year-old primigravida, of 39.6 weeks gestation, reported to the hospital complaining of abdominal pain with decreased fetal movements. She was a known case of hypothyroidism. An ultrasonographic examination of foetus suggested Arnold Chairi malformation, and no fetal movements indicating intra uterine foetal death (IUFD). Hence, labour induction with artificial rupture of membrane was performed and vaccum assisted delivery was conducted.

Patient received urinary catheterization for 24 hours. The next day, she developed fever with spike for which intravenous ciprofloxacin and doxycycline was started. Laboratory investigations revealed Total leucocyte count (TLC) of 24,500/cu.mm with 90% polymorphs and 10% Lymphocytes, suggestive of infection.

Urine routine microscopy showed 5-6 pus cells and occasional RBCs / high power field with bacteriuria. Voided urine sample was received for culture and sensitivity. Urine was inoculated on Sheep blood agar and MacConkey's agar and incubated at 37° C for 24 h. On blood agar, dark, yellow colored, 1-2 mm, non hemolytic, low-convex, circular colonies with regular margins were observed after overnight incubation (Figure 1). No growth was observed on MacConkey's agar. A Gram's stained smear of the colony on blood agar revealed Gram negative bacilli that were non-motile, catalase, and oxidase positive. Indole was produced in tryptophan broth; urease production and citrate utilization were negative while esculin was hydrolysed. The organism was identified as *C. indologenes* by both conventional biochemical reactions and *Vitek system* (*version VITEK 2 compact, Biomerieux, France*).

The flexirubin type of pigment was confirmed by adding 1 drop of 10% KOH solution on bacterial growth on Nutrient agar. The color of the colonies changed from yellow to red (Figure 2)[1] Antimicrobial susceptibility testing was performed and interpreted as per CLSI 2013 for *Pseudomonas aeruginosa* on Muller Hinton agar by Kirby Bauer disc diffusion method.[5] The isolate was found to be susceptible to tetracycline, tigecycline and trimethoprim-sulfamethoxazole and resistant to norfloxacin, ciprofloxacin, levofloxacin, nitrofurantoin, gentamicin, amikacin, ceftazidime, imipenem, meropenem,

piperacillin-tazobactam, colistin, and polymyxin. Based on this report, ciprofloxacin was discontinued and tigecycline (intravenous 50 mg 12 hourly) was started and continued for 5 days. Fever subsided within two days of changing the antibiotic.

Attempt was made to determine the source of infection. Water samples of different taps in the area where patient was admitted, swabs collected from instrument trolley and instruments used for assisted delivery and the urine containers used to collect the sample were processed but none of these revealed the presence of *C. indologenes*.

Discussion

C. indologenes was first isolated from a clinical specimen in 1993 from the tracheal aspirate of a patient with ventilator-associated pneumonia.[6,7]

The genus *Chryseobacterium* belongs to the family *Flavobacteriaceae*. Six species of *Chryseobacterium* are commonly isolated from clinical specimens: *C. meningosepticum*, *C. odoratum*, *C. multivorum*, *C.breve* and group IIb *Chryseobacterium* species, which includes *C. indologenes* and *C. gleum. Members of genus Chryseobacterium* are Gram-negative, aerobic, nonfermentative, oxidase and catalase-positive, non-motile bacilli that produce a distinct yellow to orange pigment. They are readily distinguished from other non-fermenters by their ability to produce indole in tryptophan broth, but the reaction often is weak and difficult to demonstrate.[8]

C. indologenes is an uncommon human pathogen. The clinical significance of *C. indologenes* has not yet been fully established, because this bacterium has not been frequently recovered from clinical specimens. Reported infections include bacteremia, ventilator - associated pneumonia, indwelling device associated infection, urinary tract infections, biliary tract infection, peritonitis, lumboperitoneal shunt infection, ocular infections, surgical and burn wound infections.[9] In present case patient underwent catheterization and instrumentation for artificial rupture of membrane.

C. indologenes is a rare human pathogen reported to have caused hospital-acquired infections in Taiwan and rarely elsewhere. Six cases have been reported in Europe, two in Australia, and four in the USA. In addition, ophthalmic *C. indologenes* infections have been reported including one case report in the USA, one in Taiwan and one in Spain.[10]

Majority of studies from India have reported *C. meningosepticum*. Recently however, Sudharani *et al* have reported *C. indologenes* bacteremia in a preterm baby, where environmental sampling did not yield the source of infection[11] and Eshwara VK et al reported neonatal meningitis and sepsis due to *C. indologenes*.[12]

Antimicrobial susceptibility data on *Chryseobacterium* species remain very limited. In addition, results of susceptibility testing vary when different methods are used.[13]

Results from disk diffusion methods may not be reliable, so broth reference quality microdilution tests should be performed when possible.

According to the results of the SENTRY Antimicrobial Surveillance Program (1997-2001), the most active agents against *C. indologenes* are the quinolones (garenoxacin, gatifloxacin, and levofloxacin) and trimethoprim-sulfamethoxazole (≥95% susceptibility), followed by piperacillin-tazobactam (90% susceptibility). Ciprofloxacin, cefepime, ceftazidime, piperacillin, and rifampin are showing reasonable activity (85% susceptibility). On the contrary, aminoglycosides, other *β-lactams*,

chloramphenicol, and linezolid are not appropriate for treating infections by this organism.[14] The present isolate demonstrated susceptibility to tetracycline, tigecycline and trimethoprim-sulfamethaxazole but not to quinolones, betalctams and aminoglycosides. The Vitek system also revealed the similar results with sensitivity to minocycline, tigecycline, and trimethoprim-sulfamethaxazole but not to quinolones, betalctams and aminoglycosides.

C. indologenes is a betalactamase producer and demonstrates high level of multi drug resistance with inherent resistance to carbapenems, empirical antibiotic therapy may not cover this organism.[15,16]

Conclusion

In conclusion, since *C. indologenes* is a betalactamase producer and demonstrates high level of multi drug resistance with inherent resistance to carbapenems, empirical antibiotic therapy may not cover this organism. Proper management of infection by this relatively resistant organism warrants correct identification and antimicrobial susceptibility testing.

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Figure 1. Dark yellow colonies of *C. indologenes* on blood agar

Figure 2. *C. indologenes* on nutrient agar with addition of 10% KOH