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Case Report

Microbiology Section

Chryseobacterium indologenes Bacteraemia in a Man with Oesophageal Cancer: A Case Report

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ABSTRACT

Chryseobacterium indologenes is a rare pathogen of the humans and is normally found in the environment in soil, plants and foodstuffs. Infections caused by *C. indologenes* have been reported as a cause of serious infections in adult immune-compromised patients and in patients with indwelling catheters. We report a case of a 63-year-old man with oesophageal cancer who underwent surgery at our institute and developed *C.indologenes* bacteraemia almost a month after the operation. Our study reiterates the fact that severe underlying disease, long duration of broad-spectrum antibiotics and invasive devices can be risk factors for developing bacteraemia from novel pathogens such as *C.indologenes*.

Keywords: Broad-spectrum antibiotics, Indwelling catheters, Immune-Compromised, Surgery

CASE REPORT

A 63-year-old man with adenocarcinoma oesophagus involving the lower one-third oesophagus, gastro-oesophageal junction and proximal stomach was admitted to the Gastro-intestinal Surgery Department at GB Pant Hospital, New Delhi. He underwent a distal oesophagectomy and proximal gastrectomy with intrathoracic anastomosis. Post-operatively, the patient developed respiratory distress and chest X-rays revealed pneumonic patches. The patient was put on a ventilator. Mucus-trap cultures on the 22nd post-op day yielded *E.coli* which was only sensitive to tigecycline. Urine and blood cultures were sterile. The patient was started on tigecycline and the condition of the patient improved gradually. Repeated mucus trap cultures yielded no growth and he was removed from ventilator support. After 2 weeks, the patient again developed respiratory distress and was put on ventilator support. Mucus trap cultures grew *Pseudomonas* species which was only sensitive to Imipenem. The patient was subsequently put on Imipenem. Urine and blood cultures were again sterile.

Three repeated blood cultures during this period (a month after the surgery) on alternate days yielded circular, smooth, yellow-pigmented colonies on sheep blood agar on incubating at 35°C overnight. Growth on peptone medium also yielded yellow-pigmented colonies. The organism was identified as *C. indologenes* by both conventional biochemical reactions and the Vitek 2 (BioMerieux) identification system. The sensitivity of the isolate was determined by Vitek using *Escherichia coli* ATCC 25922 and *Pseudomonas aeruginosa* ATCC 27853 as controls. The MICs for the isolate were 1mg/litre for ciprofloxacin, and ≤20 mg/litre for cotrimoxazole. The isolate was resistant to all other antibiotics tested, such as amikacin, gentamicin, cefepime, ceftriaxone, cefuroxime, cefoperazone-sulbactam, meropenem, imipenem, and tigecycline. Semi-quantitative cultures from central line tip did not show any growth. Laboratory studies revealed a white blood cell count of 20,800/µl and platelets of 1,40,000/µl. The counts rapidly decreased to 6700/µl and 6000/µl respectively over a period of 8 days. The patient was intermittently febrile and the average temperature recorded was 101°F.

Environmental samples from bedside, sink, taps, and disinfectants, from the patient's medical ward were collected and cultured as per standard guidelines [CDC and Healthcare Infection Control Practices Advisory Committee (HICPAC)]. All environmental samples failed to yield *C.indologenes*. The patient was admitted in a three-bedded cabin of an ICU and the organism was not isolated from any of the co-patients.

The patient was started on cotrimoxazole as it was the sensitive drug but the patient failed to respond and expired a week after the therapy was started.

DISCUSSION

Chryseobacterium species are a group of non-motile, catalase-positive, oxidase-positive, indole-positive and non-glucose fermenting gram-negative bacilli producing distinct yellow to orange pigmented colonies. The genus *Chryseobacterium* includes six species which were previously classified under genus Flavobacterium [1-3]. Not normally present in the human micro flora, they usually exist on water systems and wet surfaces and are even resistant to chlorination. In a hospital environment, medical devices such as humidifiers, respirators, endotracheal and tracheostomy tubes etc., can get colonized and serve as potential reservoirs of infection [4]. Cases of contamination of surgically implanted devices such as IV catheters and prosthetic valves in immuno-compromised patients or in patients on prolonged broad-spectrum antibiotics have also been reported [5]. *Chryseobacterium meningosepticum* is the most pathogenic member of the genus and causes neonatal meningitis with high mortality rates of upto 57% [4]. The clinical significance of *C.indologenes* yet needs to be established as it is an uncommon human pathogen and is not frequently obtained from clinical specimens. The production of biofilm on invasive devices and protease activity can be associated with the virulence of invasive infections caused by *C.indologenes* [6,7].

The treatment of choice in case of *C.indologenes* infection can be difficult, as it shows resistance to many broad-spectrum antibiotics such as aminoglycosides, penicillins, aztreonam, first, second and third-generation cephalosporins (except for ceftazidime) and varying resistance to imipenem. In a multicentre study, fluoroquinolones such as garenoxacin, gatifloxacin and levofloxacin, as well as piperacillin/tazobactam, cefepime and trimethoprim/sulfamethoxazole were found to be competent agents in treating *C.indologenes* infections [8].

In the literature, most cases of *C.indologenes* bacteraemia were detected in hospitalized patients with severe underlying disease, such as malignancies or diabetes mellitus, or indwelling devices [8,9]. Increased clinical usage of colistin and tigecycline has also been associated with increased trend in *C.indologenes* infections [10]. In our report, the patient was a 63-year-old immune-compromised male with adenocarcinoma of the oesophagus. He underwent surgery and was on long-term broad-spectrum antibiotics including tigecycline for over a month. The patient was also catheterised and put on ventilator. All these findings also comply with the study of Yi-Tsung Lin et al., [2] in Taiwan who reported malignancy, diabetes mellitus, hypertension, congestive heart failure and chronic kidney disease greater than stage 3 as the majority of underlying diseases as risk factors for developing *C.indologenes* bacteraemia. The mean age of their patients was 66 years with males being predominant. Twelve of the 16 patients had undergone various invasive procedures, such as central venous catheterization, urinary catheterization, respiratory assistance or recent surgery.

CONCLUSION

C.indologenes should be recognised as a novel potential pathogen for bacteraemia in immune-compromised hosts, patients with various comorbidities, patients on long-term antibiotics and patients who have undergone various invasive procedures during their prolonged period of hospital stay. Our patient met all the above criteria. There has been increasing evidence of healthcare associated infections with *C.indologenes* and as this bacterium is resistant to many of the broad-spectrum antibiotics, standard guidelines for management of *C.indologenes* infection have not been established as of now. Hence, timely identification and susceptibility testing might lead to a favourable outcome.

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