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Case Report

Microbiology Section

Chryseobacterium gleum: A Rare Pathogen from Respiratory Tract Infections- A Case Report

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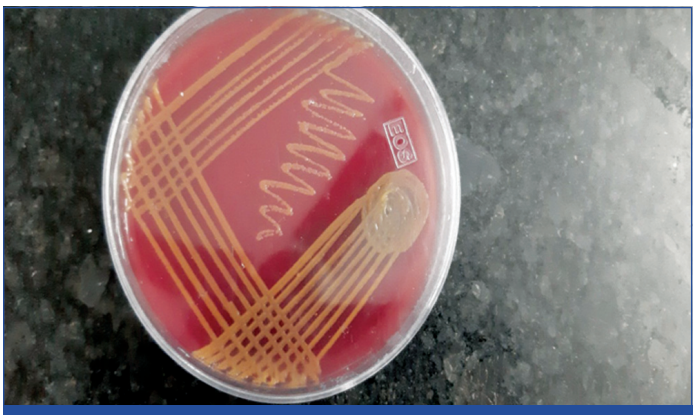
ABSTRACT

It is well known that Hospital Acquired Infections (HAIs) are a major concern in the field of medicine. The newer pathogens have been implicated as one of the causative agents in these infections. Recently our laboratory had reported a rare pathogen from a postoperative case admitted in the tertiary care hospital. The causative agent was a Gram negative bacillus, which was identified as *Chryseobacterium gleum* by automation method (VITEK 2 Biomeriux). This is a rare bacterium that was isolated from a respiratory specimen of a 32-year-old male who was involved in a road traffic accident. Repetitive culture was done followed by Gram stain and biochemical reactions and identified as *Chryseobacterium gleum* by automated system. It is interesting to study this bacterium for its virulence, habitat and source of infections. This is the second case report which has been reported as a causative agent in HAI as per our knowledge from India.

Keywords: Endotracheal secretions, Flavobacteirum, Gram negative bacillus, Hospital acquired infections, Non fermenter

CASE REPORT

A 32-year-old male with a history of road traffic accident was operated by craniotomy in a tertiary care hospital. The tracheostomy was done for further management. After 3rd day of the admission, the patient developed a lower respiratory tract infection. An endotracheal secretion was received for aerobic culture and sensitivity. Tracheal aspirate grew dark yellow (golden) coloured non haemolytic colonies on sheep blood agar (EOS Laboratories, Lot No. 210330006) nine [Table/Fig-1] and no growth on MacConkey agar (EOS Laboratories, Lot No. 210406009). The repeat cultivation from the same specimen as well as from the growth on blood agar had shown the similar growth pattern. Identification was done manually by using biochemical tests and Gram staining. However, the Gram stain and biochemical reactions were not suggestive of gram positive cocci but long slender gram negative bacilli. So, an automated identification system from an outsourced laboratory was used for identification. The report came as *Chryseobacterium gleum*, which was never isolated in our laboratory before from any respiratory specimens. Antibiotic sensitivity was done by Kirby-Bauer disc diffusion method [Table/Fig-2]. The patient was put on cotrimoxazole based on the antibiotic sensitivity reported and patient responded well and got discharged from the hospital.



[Table/Fig-1]: Growth pattern on sheep blood agar (yellow pigmented colonies).

Antibiotics	Sensitivity pattern
Amikacin (30 µg)	Resistant
Amoxyclav (30 µg)	Resistant
Imipenem (10 µg)	Resistant
Meropenem (10 µg)	Resistant
Ceftazidime (30 µg)	**Sensitive**
Ceftazidime clavulanate (30 µg)	**Sensitive**
Ciprofloxacin (5 µg)	**Sensitive**
Tigecycline (15 µg)	Resistant
Ticarcillin clavulanate (75/10 µg)	**Sensitive**
Ampicillin sulbactam (10/10 µg)	Resistant
Co-trimoxazole (25 µg)	**Sensitive**
Gentamicin (30 µg)	Resistant
Piperacillin tazobactam (100/10 µg)	**Sensitive**
Colistin (10 µg)	Resistant
Polymyxin B (50 Units)	Resistant

[Table/Fig-2]: Antibiotic sensitivity (Kirby Baeur Disc diffusion Method) pattern of *Chryseobacterium gleum*.

DISCUSSION

Chryseobacterium gleum belongs to the family Flavobacterium. This Gram negative bacterium is non fermentative and is unable to grow on MacConkeys agar. It grows well on sheep blood agar with golden yellow pigmentation. It is implicated mainly in infections such as urinary tract infections and pneumonia [1].

It is found in aqueous environments and is able to form the biofilms which makes it a pathogen in patients with ventilators and in patients with various catheters or intravenous lines, thus playing a role in nosocomial infections [2].

The major concern with this pathogen is their intrinsic resistance shown to drugs like carbapenems and colistin which are ultimate drug choice to treat HAIs [3]. This pathogen was reported from various countries including India in last few years [4]. In the current case report, authors have described *Chryseobacterium gleum* from an endotracheal secretion from a male patient who was operated (craniotomy) for further management.

The emergence of *Chryseobacterium gleum* was first described by the SENTRY study [5], which reported isolates of members of the genus *Chryseobacterium* to constitute 0.27% of Non Fermenting Gram Negative Bacilli (NFGNB) obtained from clinical specimens across 16 countries. In this study, total 50 isolates (24 Chryseobacterium meningosepticum, 20 *Chryseobacterium indologenes*, two *Chryseobacterium gleum*, and four Chryseobacterium spp. isolates) were collected and reported highest prevalence of Chryseobacterium in the elderly patients. They found the most active antimicrobials agents were the newer quinolones (garenoxacin, gatifloxacin, and levofloxacin) followed by rifampin, trimethoprim-sulfamethoxazole, ciprofloxacin, and piperacillin-tazobactam. However, they had reported that vancomycin showed poor potency.

Amongst the different species, *Chryseobacterium meningosepticum* (now named as *Elizabethkingia meningoseptica*) was the most frequently isolated from clinical specimens, while *Chryseobacterium gleum* was the least frequently isolated species, with only two strains isolated over the five year study period. Later, there has been a limited case report of *Chryseobacterium gleum* published so far from clinical specimens like blood, sputum, and urine and pus [6-9].

Lo HH and Chang SM in their study revealed that *Chryseobacterium gleum* had the ability to form biofilms [6]. However, its potential of biofilm formation appeared to be much lower than that of *Elizabethkingia meningoseptica*, suggested lower pathogenic capability of *Chryseobacterium gleum*. *Chryseobacterium gleum* was also recovered from bloodstream infections. The isolation of *Chryseobacterium gleum* from endotracheal secretions has not been documented from India before as per our knowledge. This is the first report from Maharashtra, India as per our knowledge. Interestingly the current strain did not show any growth on MacConkey agar plate, which was also reported by Lambiase A et al., however, study reported by Jain V et al., stated that the strain was able to grow on MacConkey agar [4,10].

Prolonged hospitalisation with indwelling catheters and the use of broad spectrum antibiotics have been reported to be the risk factors for acquiring infections. Rare isolation of such pathogens from a clinical specimen needs to be given great attention while managing these infections. It is also essential to see that the isolate is a real pathogen and not a coloniser. To rule out between pathogen and coloniser, repeat the cultures with certain frequencies. In index case, the patient responded well to antibiotics prescribed and repeat specimens from the patient was also possible. There are no standard guidelines available in the literature from any statutory institutions for its identification and antibiotic susceptibility testing. The literature has constantly shown *Chryseobacterium gleum* strains to be largely vulnerable to fluoroquinolones, piperacillin-tazobactam [11].

Looking at very notorious characteristics of this isolate regarding its growth on MacConkey agar and antibiotic sensitivity pattern, it is essential to study this bacterium for growth characteristics, resistance mechanisms to higher antibiotics and the sources of infections.

CONCLUSION(S)

There is a risk of infection in critically ill patients who had been admitted in Intensive Care Unit (ICU) with prolonged duration and with various devices and catheters due to emerging pathogens like *Chryseobacterium gleum*. As this pathogen has shown inherent resistance to carbapenems, colistin and polymyxin B, it is essential to identify rapidly and perform antibiotics sensitivity for guiding therapy.

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