

An extraordinary meningitis pathogen on a patient with ventricular catheter: *Chryseobacterium gleum*, case report

Abstract

Chryseobacterium gleum has been reported as human pathogen rarely from different clinical specimens. Here we report first case as a meningitis pathogen on a patient with ventricular catheter who had head trauma prior to disease. This case report indicates the importance of identifying microorganisms and performing antibacterial susceptibility testing, clinicians changed antibiotherapy according to antibacterial susceptibility testing results and patient's clinical situation improved dramatically.

Volume 8 Issue 6 - 2020

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Received: December 01, 2020 | **Published:** December 29, 2020

Introduction

The genus *Chryseobacterium* (formerly *Flavobacterium*)¹ whose type species is *Chryseobacterium gleum*² and belongs to the family Flavobacteriaceae (phylum Bacteroidetes), represents a group of Gram-negative, non-fermenting, catalase-positive, oxidase-positive and indole-positive aerobic bacilli. *Chryseobacterium* species are uncommon human pathogens, and most cases are nosocomial and are often associated with immunosuppression or indwelling devices. *Chryseobacterium* is typically found in soil, water, plants, and food products and can survive in hospital environments, chlorinated water, and wet surfaces, all of which serve as potential reservoirs of infection.³

Chryseobacterium gleum has been reported as cause of urinary tract infection, sepsis and respiratory tract infection previously in different countries. We present the first case of *Chryseobacterium gleum*, to our knowledge, as the cause of meningitis on a patient with ventricular catheter.

Case presentation

56 years old male patient was sent to our hospital by plane ambulance due to disorder of consciousness. He had head trauma, was hospitalized and charged two weeks ago. Disorder of consciousness started four days ago. Wide pneumocephaly was detected at brain computer tomography at our center. He was hospitalized and underwater drainage system with ventricular catheter was performed due to development of rhinorrhea during his hospitalization. Duroplasty and repairment of ethmoid fracture defect was performed by us at our center. Meropenem and Linezolid treatment was started empirically. CSF cultures were obtained and Meropenem and Colistin treatment started due to continuation of high fever by the suggestion of Infectious Disease Department. *Chryseobacterium gleum* and its

antibiogram test results were reported by Microbiology Laboratory from CSF cultures obtained from ventricular catheter three times. Meropenem and Ciprofloxacin treatment started intravenously according to antibiogram results. Patient's fever got down, leukocyte count and CRP levels of patient turned to normal levels. Rhinorrhea had not repeat and pneumocephaly was not detected at control brain computed tomographies, and the patient was discharged with oral ciprofloxacin 750 mg (two times a day) in the condition of polyclinical control.

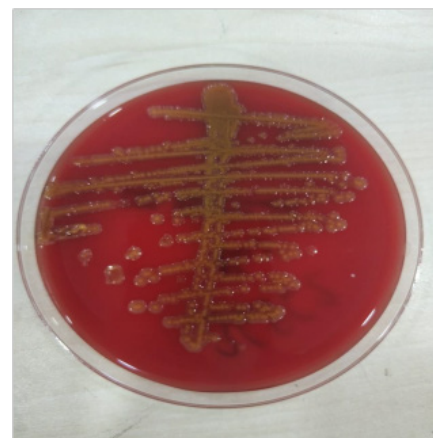


Figure 1 Yellow pigmented colonies of *Chryseobacterium gleum* on 5% blood sheep agar, and color of colonies turned red after applying 10% KOH in the middle of the plate.

Cerebrospinal fluid cultures were obtained consecutively three times in three weeks. All cultures were inoculated on 5% sheep blood agar plate, Macconkey agar plate, chocolate agar plate and thiogluconate broth medium. Direct examination of all of three

specimens revealed rich Gram-negative bacilli, but no leukocyte by Gram staining. 5% sheep blood agar and chocolate agar grew yellow-colored 1 to 2 mm circular colonies ($>10^6$ CFU/mL) with regular margins. Colour of colonies which were applied 10% KOH turned to red after applying. (Figure 1) There was no growth on Macconkey Agar.

Vitek 2 Compact System successfully identified *Chryseobacterium gleum* and the result was confirmed by using Mass spectrometry (Vitek MS matrix-assisted laser desorption/ionization, time-of-flight, bioMérieux). Antibioqram test for all of the three isolates was performed at Vitek 2 Compact System with AST-GN 326 Gram negative susceptibility card. Susceptibility results were found as shown on table 1.

Table 1 Antibiotic susceptibility test results of *Chryseobacterium gleum*

Antibiotic	MIC value	Result
Piperacillin	≥ 128	Resistant
Piperacillin/ Tazobactam	≥ 128	Resistant
Gentamicine	8	Intermediate
Amikacine	32	Intermediate
Ceftazidime	32	Resistant
Cefepime	≥ 32	Resistant
Aztreonam	≥ 64	Resistant
Imipenem	≥ 16	Resistant
Meropenem	≥ 16	Resistant
Tobramycin	≥ 16	Resistant
Ciprofloxacin	0.5	Sensitive
Levofloxacin	0.25	Sensitive
Trimetoprim/Sulfamethaxazole	≤ 20	Sensitive
Netilmicin	16	Intermediate
Tetracycline	8	Intermediate

Discussion

Chryseobacterium gleum has been reported as cause of urinary tract infection, sepsis and respiratory tract infection previously in different countries. Seven cases has been reported according to pubmed search and four cases were respiratory tract infections and three were urinary tract infections. The most common species of the genus *Chryseobacterium* causing human disease is *F. meningosepticum* followed by *C. indologenes* and *C. gleum*.⁴ Typically thought of as an organism of low virulence, *C. gleum* may cause serious infections, particularly among immunocompromised patients.³ The genus *Chryseobacterium* can colonize at medical devices, catheters in hospital environment. A study conducted in Taiwan revealed that *C. gleum* had the ability to form biofilms.⁵

Bloodstream infection due to *C. gleum* has been reported in only two patients in a single study from Taiwan.⁵ Interestingly; one of those patients had suffered from head trauma and grew *C. gleum* from a central venous catheter, similar to the patient profile reported by Vidhi Jain et al.,⁶ and us.

Our patient had a head trauma and rhinorhea, he had an operation in our hospital and ventricular catheter is applied. *C. gleum* infected the patient with probably its biofilm, and grew three times on cultures. The patient's clinical situation is dramatically approved by changing the antibiotic treatment after antibioqram results were received. *C. gleum* grew on all three CSF cultures sent in three weeks. Meropenem was not enough to solve the infection, because of resistance. 400 mg Ciprofloxacin was administered intravenously three times a day after first antibioqram result was received. Patient's fever got low at first day of administration of ciprofloxacin. This dramatically response to the treatment indicates the importance of culture and antibioqram tests performing at Microbiology laboratories.

Infections concerning medical devices, catheters are still a very important problem at especially intensive care units for immunocompromised and even for immunocompetent patients. Adequate hand hygiene is one of the best ways for preservation. Our case had a head trauma, a predisposing factor which makes this infection occur easier. A complete adaptation to sterility and hygiene rules in hospital units could be life saving for many patients.

Acknowledgments

None.

Conflicts of interest

The authors declare that there is no conflict of interest.

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