

Case Series of *Aerococcus urinae*: A Rare Entity, its Role in UTI and its Successful Management in Healthy as Well as Immunocompromised Patients

Dr. Anu Sharma¹, Dr. Sonal Agarwal², Dr. N. K. Shaikh³

Assistant Professor, Microbiology, Microbiology Department, Dr. V.M. Govt. Medical College Solapur

²Post Graduate Student, Microbiology Department, Dr. V.M. Govt. Medical College Solapur

³Associate Professor, Microbiology Department, Dr. V.M. Govt. Medical College Solapur

Abstract: *Aerococci are often confused as Streptococci in laboratories. Recent advances have led to accurate identification of these organisms. These organisms rarely cause infection in human but they are seen to cause UTI, Endocarditis and osteomyelitis. Further studies in Aerococci are needed for better understanding of pathogenesis of the bacteria and for appropriate treatment. As only few studies have been undertaken on Aerococci so far*

Keywords: UTI, MALDI TOF MS, Vitek-2, *Aerococci*, Endocarditis, Osteomyelitis

1. Introduction

Aerococci are usually misidentified as *Staphylococci* or *Streptococci* in Microbiology laboratories¹. *Aerococcus* species are rarely suspected to cause human disease and often considered as contaminant in cultures from non-sterile sites².

Due to similarities with other bacteria they are often misdiagnosed and the true prevalence of *Aerococcus* in causing human infections is underestimated³.

Due to advent of newer technologies like Vitek-2 Compact and MALDI TOF MS (Matrix assisted laser desorption and ionization, time of flight, mass spectrometry) more number of cases of *Aerococcus* have been reported in recent years.

We hereby present a case series of 3 patients where *Aerococcus* species were isolated.

CASE 1

A 27 years old male patient was admitted to the hospital with history of high grade fever, flank pain and altered sensorium. Patient was on antiretroviral medications since 5 years. Patient's CD4 cell count was 200 cells/mm³, CXR of the patient did not show any significant finding. CSF, blood and urine sample was sent for culture and sensitivity before administration of antibiotics. On microscopic examination of CSF occasional pus cells and RBCs were seen, glucose and protein values were within normal range. Urine on wet mount showed more than 10 pus cells/HPF along with cocci. On Gram stain pus cells were seen along with gram positive cocci arranged in cluster, pairs and tetrads. Blood sample was incubated at 37°C for 18-24 hours and then subculture was done on blood agar and MacConkey agar. Culture of CSF on blood agar/ chocolate agar and MacConkey agar showed no growth and reported sterile after 48 hours of incubation.

Culture of urine on blood agar showed alpha-hemolytic colonies which were catalase negative culture smear showed gram positive cocci which were seen as clusters and tetrads. The sample was processed using Vitek-2 compact and was identified as *Aerococcus urinae*.

Blood sample was inoculated on blood agar and MacConkey agar for 18-24 hours at 37°C. No growth was seen on MacConkey agar but on blood agar. Alpha hemolytic colonies similar to colonies grown in urine sample were observed. Growth was subjected to Vitek-2 compact as identified as *Aerococcus urinae*.

Since the growth on blood and urine sample were same, pathogenic potential of the organism was established

Antibiotic susceptibility testing on Vitek-2 showed sensitivity to penicillin-G, Vancomycin, Nitrofurantoin and Gentamicin. Patient was started on IV penicillin-G and Gentamicin for 5 days. Patient condition showed improvement from day 2 of antibiotic administration, patient was discharged 10 days only after repeat blood and urine culture reports were negative. Patient on follow up was fully recovered and was found to be compliant with his anti-retroviral medications.

CASE 2

A 65 years old male patient was admitted to the hospital with fever along with urgency, frequency and dysuria. Patient was hypertensive, diabetic and had benign prostatic hypertrophy since past 6 years. His vital parameters were heart rate 120bpm, respiratory rate 24 breath/min. BP 160/90mm Hg. Chest auscultation revealed normal heart sounds without any murmur. All laboratory parameters were under normal range. Blood and urine sample was taken for culture and sensitivity before administration of antibiotics. Blood was reported sterile after 14 days of incubation as no growth was seen.

Urine routine microscopy showed > 5 pus cells/HPF and occasional RBC's. On gram stain gram positive cocci in pairs and tetrads were seen.

On culture no growth was seen on Mac Conkey agar after 48 hours of incubation, while alpha hemolytic colonies resembling streptococci were seen on blood agar after 24 hours of incubation. Growth was subjected to Vitek-2 compact and identified as *Aerococcus urinae*. Antibiotic sensitivity testing showed high sensitivity to beta lactam antibiotics, Amikacin and Gentamicin. Resistance was seen for fluoroquinolones and Cotrimoxazole. Patient was treated with antibiotics for 7 days and repeat urine culture was negative following which patient was discharged.

CASE 3

A 13 years old male was admitted to the hospital with fever, rigors and chills, burning micturition, urgency, frequency and dysuria with very offensive odor from urine. There was no significant past history or family history. Urine and blood sample was sent for culture and sensitivity before administration of antibiotics. Blood sample was reported sterile after 14 days of incubation as no growth was seen. Urine analysis showed evidence of 10-15 pus cells/HPF.

Culture on blood agar showed alpha hemolytic colonies resembling *Streptococci*, which were catalase negative, however no growth was seen on Mac Conkey agar. Growth was subjected to Vitek-2 Compact for identification and antibiotic sensitivity testing. Organism was identified as *Aerococcus urinae*, sensitivity was seen for Penicillin, Ceftriaxone, Vancomycin and Gentamicin. However Ciprofloxacin and Cotrimoxazole were found to be resistant. Patient was started on IV Penicillin-G and Gentamicin. Patient responded well to the antibiotics and was discharged within a week after urine culture was reported sterile on repeat culture.

2. Discussion

Aerococcus are gram positive cocci, facultative anaerobes, which is catalase negative. Two species *Aerococcus urinae* and *Aerococcus sanguinicola* are pathogenic to humans. *Aerococcus* produce alpha-hemolytic colonies on blood agar while on gram stain they appear in clusters like staphylococci⁴. *Aerococcus urinae* may cause urinary tract infection especially in elderly males, other infections caused by them are endocarditis, peritonitis, vertebral osteomyelitis and sepsis⁵.

3. Conclusion

Recent advances have enabled us for diagnosing rare entities like *Aerococcus urinae*. As there diagnosis based on conventional method is often misleading and difficult. However more studies are required for better understanding of the etio-pathogenesis of *Aerococcus*, its clinical course and antibiotic susceptibility pattern in case of Aerococcal infections.

References

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