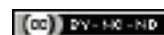


Actinomyces turicensis causing Urinary Tract Infection in Nephrotic Syndrome Patient- A Case Report

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ABSTRACT

Urinary Tract Infections (UTI) are one of the most common bacterial infections which accounts for significant cost to health care and it is one of the important cause of bacteremia. *Escherichia coli* remain the most common causative agent followed by *Klebsiella pneumoniae*, *Proteus mirabilis* and *Enterococcus* species. *Actinomyces turicensis* (*A. turicensis*) belongs to the family Actinomycetaceae. It is a rare pathogen and an infrequent cause of UTI. The author highlights one such case of a 42-year-old male with history of Nephrotic Syndrome (NS) presented with complaints of fever, dysuria and loose stools for three days. He was on treatment with corticosteroids for a long time. *A. turicensis* was isolated from urine of this patient as a single pathogen on culture and was found to be sensitive to Ampicillin, Ciprofloxacin, Cotrimoxazole and Nitrofurantoin. The patient responded well to Metronidazole and ampicillin and was discharged. The pathogenic importance of this organism cannot be undermined and should not be ignored in such cases who are on corticosteroids or any immunosuppressive drugs.

Keywords: Actinomycetaceae, Bacteremia, Kidney disorder

CASE REPORT

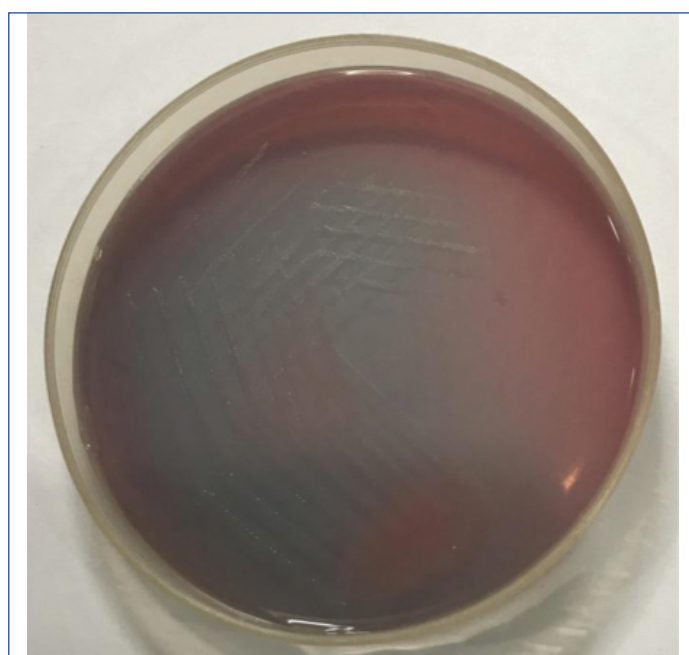
A 42-year-old non-diabetic male who was otherwise a known case of NS presented with complaints of fever, dysuria and loose stools for three days. He was on treatment with corticosteroids for one and half years to manage his underlying NS and similar history in family was not present. On examination, he was febrile, but no pain abdomen or renal angle tenderness could be elicited. His physical examination revealed no abnormalities. On investigation, his blood culture was sterile and stool sample did not reveal any pathogen on culture. Other laboratory investigations showed that the patient was anaemic [Table/Fig-1]. The consent form was obtained from the patient for his clinical information to be published.

Investigation	Value	Normal range
Urine analysis		
Glucose	Present (2+)	Absent
Protein	Present (2+)	Absent
Cast	Granular cast (3+)	Absent
WBC	5-10/HPF	0-1/HPF
Crystal	Absent	Absent
Interpretation: Presence of glycosuria, Proteinuria and Pyuria suggests the presence of renal abnormalities		
Haemogram		
Haemoglobin	10.1 gm%	13.2-17.3 gm%
RBC count	$3.81 \times 10^6/\mu\text{L}$	$4.3-5.7 \times 10^6/\mu\text{L}$
Haematocrit	31.7%	38-50%
Platelets	$173 \times 10^3/\mu\text{L}$	$150-450 \times 10^3/\mu\text{L}$

[Table/Fig-1]: Laboratory investigations.

Mid-stream clean catch urine sample was sent to Microbiology laboratory for culture. Grossly, the urine was turbid. Microscopic examination revealed the presence of pus cells without any RBC and epithelial cells. Using the standard semi-quantitative method [1], the sample was inoculated onto Cysteine-Lactose-Electrolyte Deficient (CLED) agar and 5% sheep blood agar. After 18-24 hours of incubation at 37°C aerobically, very minute pale colonies were seen on the CLED agar [Table/Fig-2], while on the blood agar, small grey, convex circular non-haemolytic colonies were observed

with a colony count of $>10^4$ CFU/mL [Table/Fig-3]. Both catalase and oxidase tests were negative. Gram stain showed short thin branching curved Gram positive rods [Table/Fig-4] which were non-acid fast, non-motile, did not hydrolyse aesculin, did not hydrolyse urea and was negative in the CAMP test (Christie-Atkins-Munch-Peterson). The colonies were subjected to MALDI-TOF-MS (*version 3.2, Biomerieux, France*) and it was identified as *Actinomyces turicensis*. As per the Clinical Laboratory Standards Institute (CLSI) recommended method [2], antimicrobial susceptibility testing was performed and the strain was found to be sensitive to Ampicillin, Ciprofloxacin, Cotrimoxazole and Nitrofurantoin.

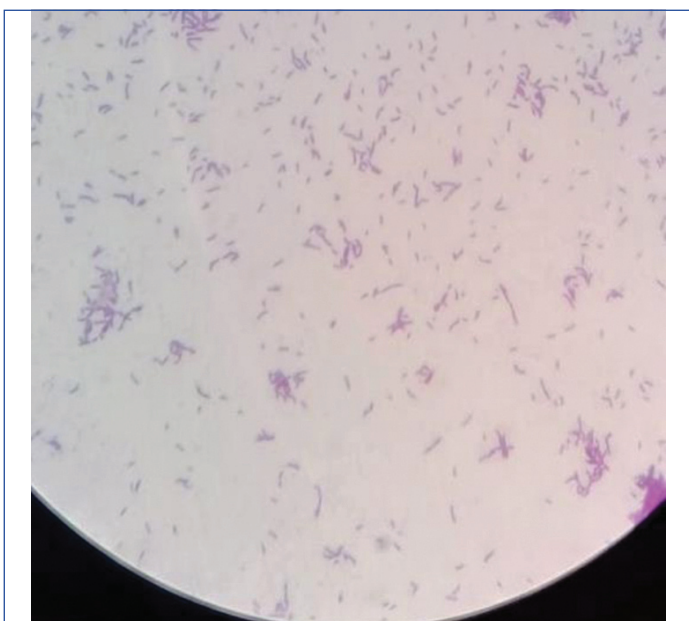


[Table/Fig-2]: CLED agar showing colonies of *Actinomyces turicensis*.

The patient was started on Metronidazole 400 mg/PO thrice daily and Ampicillin 500 mg/PO every 8 hourly and responded well. He was discharged on the same antimicrobials after two days of stay in the hospital. After seven days of therapy, the urine sample was submitted for culture which was found to be sterile.



[Table/Fig-3]: A 5% sheep blood agar plate showing colonies of *Actinomyces turicensis*.



[Table/Fig-4]: Gram stain done from culture.

DISCUSSION

Actinomycosis is an indolent chronic bacterial infection caused by gram positive filamentous bacteria which belongs to the family, Actinomycetaceae. It contains species which can withstand anaerobic to microaerophilic conditions of growth. *Actinomyces israelii* has long been considered as causative organism for actinomycosis. The availability of advanced automated bacterial identification system and molecular methods, many species of *Actinomyces* has been identified with ease from various clinical specimens [3-5]. In this regard, *A. turicensis* is emerging as an important cause of infection at many body sites. This report discusses the presentation and diagnosis of one such case with a rare association of UTI caused by *A. turicensis*. *Actinomyces* genus consists of organism which is obligate anaerobe as well as aerotolerant. They are Gram positive branching rods which on serial subcultures tend to appear coccobacilli which are arranged singly or in pairs, are non-acid fast bacilli and non-motile [6]. There are many species which have been identified till now some of which are pathogenic to man. The most common species is *A. israelii* [3,7].

Actinomyces turicensis was first reported in 1995 by Wust J et al., [6]. Since then it has been found to be associated with infections in various sites such as genital, UTI and skin infection [8]. In a study by Hall V et al., *A. turicensis* was isolated in 18.5% (80/432 strains) of the clinical cases of actinomycosis studied [4]. The most common clinical presentation was penile lesion followed by rectal abscess. According to another study by Clarridge JE and Zhang Q detected *A. turicensis* in urine and urethral exudate samples from 9 patients out of 23 cases [9]. In another study done by Sabbe LJ et al., *A. turicensis* was isolated from six patients with urethritis and cystitis and reported as the sole organism in three male patients [10]. The study also showed that in both males and females, *A. turicensis* was detected in connection with urethritis and cystitis. In a case report by Kansara T et al., this organism was found to be associated with renal stones and life threatening sepsis [11]. According to Vandamme P et al., most strains of *A. turicensis* which were isolated from various specimens were susceptible to antibiotics such as Penicillin, Oxacillin, Erythromycin, Cefazolin, and Cotrimoxazole [12]. In the present case, *A. turicensis* isolated from urine was found to be sensitive to Ciprofloxacin, Ampicillin and Nitrofurantoin, Cotrimaxazole. The patient was started on Metronidazole and Ampicillin after two days of sending urine culture. Urine sample after seven days was found to be sterile on culture.

CONCLUSION(S)

This case report highlights the importance of lesser-known agents of UTI and the importance of *A. turicensis* which cannot be overemphasised, considering the underlying condition of the present case. The identification of this pathogen by rapid diagnostics is need of the hour, which aids in early treatment of the rare organism.

Authors and contributors: SD, GP performed the experiments/ tests and drafted the manuscript. SKN, PPS were involved in the clinical management of the patient. PPS added to the clinical data in the manuscript. JM supervised and interpreted the test results and finally edited the manuscript.

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