

# Isolation of *Haemophilus influenzae* from Urine of an Elderly Male Patient with Carcinoma Bladder-An Under-recognised Pathogen?

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## ABSTRACT

*Haemophilus* species are rare uropathogens. The incidence and significance of *Haemophilus* species isolated from the genitourinary tract are not well studied. Here we describe the serendipitous isolation of *Haemophilus influenzae* in an elderly male, with an underlying urothelial carcinoma of bladder, who presented with Urinary Tract Infection (UTI). This case report further strengthens the cause of inclusion of special medium like chocolate agar in the work up of UTI in selected population.

**Keywords:** Chocolate agar, Dysuria, Uropathogen

## CASE REPORT

A 77-year-old man presented to the Urology Outpatient Department with complaints of pain over the right loin with burning micturition, haematuria and terminal dysuria for 10 days. He was previously diagnosed with a high grade urothelial carcinoma of the bladder wall along with Benign Prostatic Hypertrophy (BPH) eight years back. He had undergone transurethral resection of prostate and bladder wall for BPH and urothelial carcinoma of bladder wall, respectively, six years prior. A revision of transurethral resection of bladder wall for the urothelial carcinoma was done again five months prior. He was otherwise a moderately built adult with normal nutritional status. He had no underlying comorbid conditions such as diabetes or hypertension. During the present admission, for the above complaints, a revision of transurethral resection of bladder wall was planned. An early morning urine sample was collected and a urine culture was sent as a part of preoperative work up to the Department of Microbiology.

The urine was macroscopically turbid with no gross haematuria. The wet mount microscopy of the uncentrifuged urine revealed more than 25 pus cells and less than five epithelial cells per high power field. The Gram stain showed two to three pus cells with Gram negative rods per oil immersion field. The urine sample was plated onto Cysteine Lactose Electrolyte Deficient (CLED) medium and blood agar (Hi-Media). After incubation at 37°C for 24 hours aerobically, CLED medium showed growth of white colonies, whereas the blood agar showed white haemolytic colonies and translucent colonies around them with the colony count of 10<sup>5</sup> CFU/mL (Colony Forming Unit) of each of the two [Table/Fig-1]. The translucent colonies grew around the white haemolytic colonies but did not grow independently of the white colonies suggestive of satellitism.

On further processing white colonies were found to be catalase positive, oxidase negative, slide and tube coagulase positive, and thus identified as *Staphylococcus aureus* [1]. The translucent colonies showed satellitism, fermented xylose and glucose, and thus identified as *Haemophilus influenzae* [1]. The antimicrobial susceptibility testing was carried by Kirby Bauer disc diffusion method as per the Clinical Laboratory Standards Institute (CLSI) guidelines 2017 [2]. The *Haemophilus* isolate was sensitive to all the antibiotics tested viz., amoxicillin clavulanate (20/10 µg), ceftriaxone (30 µg), co-trimoxazole (1.25/23.75 µg), nitrofurantoin (300 µg) and tetracycline (30 µg). The *Staphylococcus aureus* isolate was sensitive to cefoxitin (24 mm), nitrofurantoin (19 mm) and ciprofloxacin (22



[Table/Fig-1]: Blood agar plate demonstrating the phenomenon of satellitism.

mm) among the antibiotics tested viz., penicillin (10 U), tetracycline (30 µg), nitrofurantoin (300 U), ciprofloxacin (5 µg) and cefoxitin (30 µg). No further confirmation of the *Haemophilus* species was done due to non availability of X and V discs. The patient was treated with nitrofurantoin 100 mg twice daily for seven days and over 48 hours, he improved symptomatically. Urine culture repeated after one week of treatment was found to be sterile.

## DISCUSSION

*Haemophilus* species are rare pathogens among the causative agents of UTI. They are more commonly reported in children [3]. Among adults, they have been reported to cause UTI in elderly males with urogenital abnormalities [4]. The index patient also was an elderly male with structural problems of the urinary tract (urothelial carcinoma of bladder and BPH) which would have predisposed to *Haemophilus influenzae* UTI. One reason that has been suggested for the rare occurrence of *Haemophilus* UTI is that the media routinely used in most of the laboratories for work up of a patient with UTI do not favour its growth. Thus, the true incidence remains unstudied. Although, no selective media was used for plating the urine of the

index patient, since *Staphylococcus aureus* was a copathogen, *Haemophilus* was able to grow on the blood agar, as the required X and V factor could have been provided by the *Staphylococcus aureus*. If not for the copathogen, in the index case, *Haemophilus* would not have been isolated from the urine.

Although, reported to cause infections of the genito urinary tract such as prostatitis epididymo-orchitis in children and elderly males with obstructive uropathy and other urogenital abnormalities, the exact uropathogenesis of *Haemophilus* species remains enigmatic [4-7]. Analysing the reported cases of *Haemophilus influenzae* causing UTIs, it is evident that most of the affected patients have an underlying urogenital abnormality. Also most of the isolates were pathogens invading from blood stream, and were non typable [8]. Among the affected women where invasive infection was reported, pregnancy was a risk factor in majority of cases [8]. In the present case, the mode of entry could not be established. Also, the coinfection with *Staphylococcus aureus* has been reported for the first time.

The exact prevalence of UTI caused by *Haemophilus* may be underestimated as it is not a routine practice to include chocolate agar for urine culture. Hence, to understand the real burden of UTI due to *Haemophilus* species, this report would also support the routine use of special media (e.g., chocolate agar) for plating urine in UTI occurring in a targeted population i.e., children, pregnant women, elderly males or persons with structural problems of the urinary tract [9]. Studies carried out in this regard would help us to understand the incidence and risk factors of UTI caused by *Haemophilus* species. This would also pave way for understanding the uropathogenesis of these organisms.

## CONCLUSION

*Haemophilus* species although rare, can cause UTI. Exact burden of the disease and pathogenesis, still remains to be studied. Regular use of chocolate agar may be considered for processing urine samples in specific populations like children, pregnant women, people with structural anomalies of the urinary tract and elderly people.

## REFERENCES

- [1] Bergey D, Whitman W, Parte A, Goodfellow M, Rainey F. Bergey's manual of systematic bacteriology. Volume 2, 2<sup>nd</sup> ed. New York. Springer; 2005:851-53.
- [2] Wayne PA. Performance of antimicrobial susceptibility testing. 27<sup>th</sup> ed. CLSI supplement M100-S27. Clinical and Laboratory Standards Institute; 2017.
- [3] Leskovaar V, Mlinari-Dzepina A, Marijan T, Vranes J. Frequency of *Haemophilus* spp. in urinary and genital tract samples. Med Glas (Zenica). 2010;7:66-71.
- [4] Al-Mohizea MM, Alotaibi FE. An unusual case of chronic prostatitis caused by *Haemophilus influenzae* in an elderly Saudi patient: A case report and literature review. J Fam Community Med. 2014;21:193-95.
- [5] Cross JT, Davidson KW, Bradsher RW. *Haemophilus influenzae* epididymo-orchitis and bacteremia in a man infected with the human immunodeficiency virus. Clin Infect Dis. 1994;19:768-69.
- [6] Ariza Jiménez AB, Moreno-Perez D, Núñez Cuadros E, Urda Cardona A. Invasive disease caused by *Haemophilus parainfluenzae* III in a child with uropathy. J Med Microbiol. 2013;62:792-93.
- [7] Allard L, Joly-Guillou M-L, Champion G. Urinary tract infection caused by *Haemophilus influenzae* in 3 children with uropathies. Arch Pediatr Organe Off Soc Francaise Pediatr. 2012 ;19:842-46.
- [8] Fujii M, Gomi H, Ishioka H, Takamura N. Bacteremic renal stone-associated urinary tract infection caused by nontypable *Haemophilus influenzae*: A rare invasive disease in an immunocompetent patient. ID Cases. 2016;7:11-13.
- [9] Dingle TC, Clarridge JE. Clinical significance and characterization of *haemophilus influenzae* type b genogroup isolates from urine samples in an adult male population. J Clin Microbiol. 2014;52:1745-48.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Sep 28, 2017**

Date of Peer Review: **Nov 08, 2017**

Date of Acceptance: **Mar 05, 2018**

Date of Publishing: **May 01, 2018**