



Acute Psychosis Associated with Group A *Streptococcus* Urinary Tract Infection

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Introduction

- Urinary tract infections (UTI) are commonly caused by gram-negative bacteria, such as *Escherichia coli*.¹
- Diagnosis is made by urinalysis and culture and treatment involves antibiotic therapy susceptible to the cultured pathogen.²
- In those with underlying psychotic disorders, UTIs have shown to precipitate an acute psychotic episode.^{3,4}
- In the past decade, the percentage of UTIs caused by gram-positive bacteria has risen to 20%, with *Enterococcus* spp. being the most common.⁵
- Risk factors for gram-positive UTIs include advanced age, diabetes, immunodeficiency, recent hospitalization, and urinary catheterization.^{5,6}
- Group A *streptococcus* (GAS) is a common pathogen for skin and respiratory infections, such as GAS pharyngitis. However, it is not well-known as a uropathogen.⁶

Case Description

A 36-year-old Caucasian female with no prior history of psychosis was brought in by ambulance to the emergency department (ED) after being found outside exhibiting bizarre behavior and delusions involving bumble bees, knights in shining armor, the sun, and the Statue of Liberty.

History

Medical History: Post traumatic stress disorder (PTSD) and chronic pain. No prior history of psychosis, inpatient psychiatric admission, or UTIs.
Medications: sertraline 50mg once daily, gabapentin 100mg TID PRN
Surgical History: None
Family History: No family history of psychiatric disorders
Social History: Denies alcohol or illicit drug use

Initial Physical Examination

Vitals: Temperature: 98.2°F, Pulse: 125 bpm, BP: 125/83 mmHg, Oxygen saturation: 97%

Mental Status Exam:

- General appearance:** Alert, appears stated age, appropriately groomed
- Behavior:** Calm, exhibits poor eye contact
- Motor:** No tics or involuntary movements noted
- Speech:** Normal volume, increased rate
- Mood/Affect:** "okay"/labile
- Thought process:** Tangential, flight of ideas
- Thought content:** Rambling about bumble bees, knights in shining armor, and the sun
- Perceptual Disturbances:** Appears internally preoccupied and laughing to oneself. Denies auditory and visual hallucinations. Believes son is an imposter and that she is "lady liberty."
- Insight/Judgement:** Poor/poor
- Memory:** Inadequate, unable to recount events leading up to hospitalization
- Concentration:** Disorganized, distracted
- Orientation:** Oriented to self (name) only

ROS: unable to obtain

Diagnostic Results

- Laboratory analysis was notable for WBC 11.5 mm³ and CK 297 U/L
- Urine drug screen was negative, ethanol level = <4
- Non-contrast head CT scan was unremarkable
- COVID-19, Influenza A/B, and RSV tests were negative
- Urinalysis results are shown in Table 1

Hospital Course

- Urinalysis obtained in the ED was consistent with a UTI.
- Patient started a 7-day course of cephalexin 500 mg TID and was admitted to the inpatient psychiatry unit for psychiatric stabilization and safety.
- Collateral information was obtained from the patient's partner who revealed she appeared forgetful and stressed the day prior to admission.
- On day 2 of hospital stay, patient was alert and oriented to person, place, and time. She was calm, cooperative, and maintained appropriate eye contact. Her thought process was linear and logical. There was no evidence of hallucinations or delusional processes. She was still unable to recall the events leading up to her hospitalization.
- Urine culture grew >100,000 CFU/mL of *Streptococcus pyogenes* (Group A) on day 3.

Outcome

- The patient remained stable while on the psychiatric unit and there was no further evidence of psychosis.
- She completed antibiotic treatment and was discharged home after 7 days with outpatient psychiatric and primary care follow-up.

Discussion

- Because antipsychotic medications were not necessary and her mentation returned to baseline with antibiotics alone, it was determined her acute psychosis was precipitated by the UTI. Interestingly, this patient did not present with any risk factors associated with a gram-positive UTI.
- GAS pharyngitis has shown to illicit an immune-related post-infectious psychosis in children with schizophrenia. While pediatric autoimmune neuropsychiatric disorder associated with streptococcal infection (PANDAS) is well described in literature, similar symptomatology is poorly described in the adult population.⁷
- Capgras-like syndrome, a delusional misidentification syndrome has been associated with UTIs. One case report found that psychosis resolved shortly after initiating antibiotic therapy.⁸
- As in this case, prompt antibiotic therapy is associated with a good prognosis.

Conclusion

GAS is a rare uropathogen and can precipitate psychosis in otherwise healthy individuals. Treatment involves antibiotic therapy. Although GAS UTI causing acute psychosis is an exceptionally rare phenomenon, it does highlight the importance of obtaining a comprehensive workup in patients with new-onset psychotic symptoms.

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Table 1: Urinalysis Results

UA Specific Gravity	1.029	UA WBC/hpf	21-50
UA Leukocyte Esterase	Large	UA RBC/hpf	21-50
UA Nitrite	Negative	UA Squamous Epithelial	+
UA pH	6.0	UA Bacteria	++
UA Blood	Large	UA Mucous	++
UA Protein	30 mg/dL	UA Culture	>100,000 CFU/mL <i>Streptococcus pyogenes</i> (Group A)
UA Glucose	Negative		
UA Ketones	Trace		
UA Urobilinogen	1.0 mg/dL		
UA Bilirubin	Negative		