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(CASE REPORT)

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Septic shock secondary to complicated UTI: A clinical case report

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Abstract

Urosepsis is a major complication of a urinary tract infection (UTI) that happens when the infection travels to the bloodstream, potentially leading to sepsis and, in severe cases, septic shock, a life-threatening illness marked by rapid heart rate and organ malfunction. If a urinary tract infection (UTI) advances to septic shock, symptoms can include a change in mental state, fever or hypothermia, very low blood pressure, extreme pain or discomfort, and decreased urine production. Pathogens involved E.coli, Klebsiella, Citrobacter species, and P.mirabilis. Epidemiology of severe sepsis in the United States is estimated to occur in 300 cases per 100,000 population. Uti is more prevalent in women, with a lifetime risk of around 60% for women and 12% for men. UTI progress by bacteria enter the urinary tract through the urethra and multiply in the bladder. If a UTI is not treated, bacteria can move to the kidneys and circulation, leading to urosepsis, a kind of sepsis that starts in the urinary tract. When the body's immune system overreacts to an infection, it can cause organ damage and extensive inflammation leads to sepsis. Septic shock is a severe form of sepsis characterized by low blood pressure, organ failure, and a high death risk. Diagnosing tests for this condition include microbiological tests like blood cultures, urine testing, biomarkers, and imaging studies. The treatment approach for this condition includes using prompt antibiotic therapy. To maintain blood pressure and organ function IV fluids are given.

Keywords: Urinary tract infection; Sepsis; Urosepsis; Septic shock; Low blood pressure; Organ malfunction

1. Introduction

Urinary tract infections (UTIs) are common, sometimes progressive to sepsis or septic shock, which can be lethal. Sepsis is a clinical syndrome that is characterized by physiologic, biologic, and biochemical abnormalities caused by dysregulated host response to infection [1]. Urinary tract infections are the most commonly occurring disease in the population in which women are highly infected at 50% to 60% .The frequency of UTIs increases with age, and in the overall female population, women aged over 65 are getting a higher incidence of this disease[2]. Urinary tract infections occur in patients with structurally or functionally abnormal urinary tracts [complicated UTI] and in patients with anatomically normal urinary tracts [uncomplicated UTI]. Escherichia coli [E. coli] is the most common cause of uncomplicated UTIs, whereas antibiotic-resistant Enterobacteriaceae, enterococci, and Candida species often are the causes of complicated UTIs. When bacteria causing UTI enter into the bloodstream, it leads to sepsis, and this further leads to septic shock[3]. The symptoms of a UTI include cloudy urine, foul-smelling urine, a burning sensation when urinating, and passing urine frequently. Symptoms of urosepsis include reduced urine volume, trouble breathing, high fever or low temperature, and pain near the kidney[4]. The pathophysiology of urosepsis occurs when microorganisms reach the urinary tract mostly by way of the intraluminal–ascending route, more rarely by hematogenous or lymphatic routes. Inflammation is the physiologic response of the body to infection and is mediated by the release of soluble substances by cells of the immune system[5]. Laboratory investigations for this condition include microbiological tests like blood cultures, urine testing, biomarkers, and imaging studies [6]. The treatment of urosepsis includes prompt antibiotic therapy—using broad-spectrum antibiotics delivered through an IV to quickly target the bacteria causing

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infection. Fluid management—IV fluids are given to maintain BP and to support organ function. Monitoring vital signs—close monitoring of BP, heart rate, and respiratory rate—is essential to detect complications like septic shock. Oxygen therapy—If needed, supplemental oxygen should be provided. Specific antibiotic selection—depending on the suspected bacteria and local resistance patterns, antibiotics like cephalosporins, piperacillin-tazobactam, or carbapenems. Surgical intervention—In some cases, surgery may be required to remove a source of infection, like a kidney infection[7].

2. Case Report

2.1. Subjective evidence

A 54-year-old female patient came to the General Medicine Ward with chief complaints of pain in the abdomen for 6 days, fever for 6 days, and decreased urine output for 3 days. Six days before admission, the patient developed lower abdominal pain followed by fever with chills and vomiting. History of past illness includes type 2 diabetes mellitus on medication INJ Human Actrapid 6units S/C TID and pulmonary hypertension on medication TAB Sildanafil 25mg Po BD. Surgical history includes Double J stenting. Hemodialysis performed for 5 times.

2.2. Objective Evidence

All vital signs were stable during the physical examination, however the patient had edema and pallor.

Table 1 The laboratory investigations revealed significant abnormalities in multiple parameters

S.no	Parameter	Observed values	Normal values
1	WBC	15,970Cells/cumm	4000-11000 Cells/cumm
2	ESR	41mm/hr	0-13mm/hr
3	CRP	5.1mg/dl	<0.3 mg/dl
4	RBS	419mg/dl	70-140mg/dl
5	SERUM CREATININE	6.2mg/dl	0.5-1.4mg/dl
6	BLOOD UREA	143mg/dl	12.6-42.6mg/dl
7	ALBUMIN	2.2g/dl	3.5-5.2g/dl
8	TOTAL PROTEIN	4.6g/dl	6-8g/dl
9	SGPT	1356iu/l	up to 34 Iu/ l
10	SGOT	595 iu/l	5 – 34iu/l

Imaging studies have done and the reports of the CT scan shows bilateral acute nephritis, mild ascites, mild hepatomegaly with mild fatty infiltration, and reactive retroperitoneal lymphadenopathy.

2.3. Treatment

Table 2 The medical management for this condition includes

S.NO	DRUG	DOSE	ROA	FREQUENCY
1	TAB CEFIXIME	200 MG	PO	BD
2	TAB PANTOP	40 MG	PO	OD
3	TAB DYTOR	10 MG	PO	OD
4	TAB SILDANAFIL	25 MG	PO	BD
5	TAB B COMPLEX	1 TAB	PO	OD
6	TAB SOBOSIS	500 MG	PO	TID
7	INJ HUMAN ACTRAPID	6 UNITS	S/C	TID

2.4. Monitoring parameters

- Monitor all the vitals of the patient regularly.
- Observe for any itchiness and pain in the genital area.
- Regularly monitor the body temperature.
- Monitor urine output regularly.

2.5. Discharge medications

Table 3 The patient discharged with the above medication to continue at home for improvement of the patient condition

Sno	Drug	Dose	Route	Freaquency
1	Tab pantop	40 mg	Po	od
2	Tab dytor	10 mg	Po	Od
3	Tab sildenafil	20 mg	Po	Bd
4	Tab becosules	1 tab	Po	Bd
5	Inj H. Actrapid	6 u	Sc	Tid
6	Tab Nodosis	500 mg	Po	Tid

2.6. Outcome & follow up

After a seven-day hospital stay, the patient was discharged with less stomach discomfort, fever, and vomiting. The patient received a prescription for her condition and was advised to demonstrate significant improvement from urosepsis.

3. Discussion

Urinary tract infection is the cause of urosepsis. Urosepsis is a serious illness that can induce shock[8]. A UTI's symptoms include cloudy urine, foul-smelling urine, burning when urinating, and frequent urination. Symptoms of urosepsis include decreased urine volume, difficulty breathing, high fever or low temperature, and pain around the kidney[4]. In 20-40% of cases, uroseptic shock can lead to death. Urinary tract infections are more common in women[8]. They usually occur in the bladder or urethra, but more serious infections involve the kidneyUrinary tract infections (UTIs) are the most prevalent infections in the community and the most common reason for antimicrobial prescribing in ambulatory care. Multi drug resistant organisms limit the therapeutic options for complicated UTIs and represent a higher risk of deterioration and progression to sepsis and septic shock. The main risk factors for MDR organisms include recurrent urinary tract infections and underlying kidney diseases, previous antibiotic therapy, previous hospitalization, and the presence of invasive devices[9]. Antibiotics are the primary treatment for UTIs. Antibiotics used to treat sepsis include piperacillin, third-generation cephalosporin, and fluoroquinolone[7]. Early imaging of patients with septic shock caused by a suspected urine source should be investigated in order to identify obstructions that require immediate action[10].

4. Conclusion

In this case we observed that the bacterial infections can lead to serious complications and give a high risk ratio to develop UTIs. As the urinary tract infections led to the sepsis and further septic shock. For this purpose, antibacterial therapy is given to prevent sepsis; due to septic shock, the patient is on hemodialysis. At the time of patient discharge from the hospital, the symptoms were relieved and her condition was improved.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

There is no conflict of interest, according to the authors.

Statement of informed consent

The patient provided written informed consent for this case report and any associated pictures to be published. For the sake of anonymity, all individually identifiable patient information has been removed out.

References

[1] Sekine Y, Kotani K, Oka D, Nakayama H, Miyazawa Y, Syuto T, et al. Presepsin as a predictor of septic shock in patients with urinary tract infection. BMC Urol. 2021 Dec 12;21(1):144.

[2] Medina M, Castillo-Pino E. An introduction to the epidemiology and burden of urinary tract infections. Ther Adv Urol. 2019 Jan 2;11.

[3] Porat A, Bhutta BS, Kesler S. Urosepsis. 2025.

[4] M.komala, K P sampath kumar. urinary tract infection:causes,symptom,diagnosis and its management. Indian journal of research in pharmacy and biotechnology.

[5] Walsh C, Collyns T. The pathophysiology of urinary tract infections. Surgery (Oxford). 2017 Jun;35(6):293–8.

[6] Dreger NM, Degener S, Ahmad-Nejad P, Wöbker G, Roth S. Urosepsis--Etiology, Diagnosis, and Treatment. Dtsch Arztebl Int. 2015 Dec 4;112(49):837–47; quiz 848.

[7] Wagenlehner FM, Lichtenstern C, Rolfes C, Mayer K, Uhle F, Weidner W, et al. Diagnosis and management for urosepsis. International Journal of Urology. 2013 Oct 29;20(10):963–70.

[8] Yamamichi F, Shigemura K, Kitagawa K, Takaba K, Tokimatsu I, Arakawa S, et al. Shock due to urosepsis: A multicentre study. Canadian Urological Association Journal. 2017 Mar 16;11(3–4):105.

[9] Wagenlehner FME, Pilatz A, Weidner W, Naber KG. Urosepsis: Overview of the Diagnostic and Treatment Challenges. Microbiol Spectr. 2015 Sep 4;3(5).

[10] Reyner K, Heffner AC, Karvetski CH. Urinary obstruction is an important complicating factor in patients with septic shock due to urinary infection. Am J Emerg Med. 2016 Apr;34(4):694–6.