Case 2 Painful micturition

New terms

Voiding: micturition or urination (passing urine).
Flank : between last rib and the hip of the lateral side of the abdomen.
Nocturia: need to urinate during the night.
Nocturnal hyperhidrosis: night-time excessive sweating.
Dysuria: painful or burning sensation during urination.
Hematuria: blood in urine.
Pyrexia: mild fever.
Emesis: vomiting.
Bacteriuria: presence of the bacteria in the urine.
Pyuria: pus in the urine or discharge from urethra.
Leukocyte Esterase (LE): is a urine test to look for white blood cells and other signs associated with infection.
Urine specific gravity: is a laboratory test that measures the concentration of all chemical particles in the urine.
Amorphous Phosphate: They are tiny granules made of calcium and phosphate found in alkaline urine.The main cause of this is the alkaline pH decreases the solubility of the calcium phosphate (as a result of the infection).
Turbid Urine: cloudy not clear.
Frequent Urination: is going to toilet repeatedly.
Urgent Urination: is the sensation that the bladder must be emptied immediately regardless of bladder volume (it could be very low volume)

scenario

Lama, a 35 years old **woman.married** with two children ,presented to emergency with one day history of **right flank pain**, **fever**, also she **vomited once in the morning** . **she has very painful and burning sensation to pass urine(dysuria).** she has no history of medical illness.she was given **paracetamol at home** (**pain was not relieved**).

examination

CVS examination :
Normal 1st and 2nd heart sounds + no murmurs + no add sound
Respiratory examination :
normal (Lungs are clear to percussion and auscultation)
Abdominal examination :
percussion over right flank produces pain
Vital signs showed :
Tachycardia *Fever *nothing significant with BP

investigation

Examination Made	Result	Normal values	Clinical significance
Color	Yellow	Amber yellow	Normal
Character	turbid	clear	Infection
PH	6.0 acidic	4.8-8.0	Normal
Specific gravity	1.020	1.015-1.025	Normal
Protein	++	(-)	Infection
Sugar	(-)	(-)	Normal
Red blood cells	0-3 hpf	(-)	Infection
Pus cells	Many (> 100/h pf)	(-) few (3-4/hpf)	Infection
Epithelial cells	few	(-)	Infection
Amorphus phosphate	few	(-)	Infection
Bacteria	Many; (+) E.coli	(-)	Infection

CBC	Results	Normal
Hemoglobin	14.5 g/dl	M 13.5 - 17.5 g/dl F 12.0 - 15.5 g/dl
RBCs	4.5	5.05 - 5.5
WBCs	13.0 * 109/L	4. 5 - 11.0 * 109/L
Platelet	355 * 109/L	140 - 450 * 109/L

	Normal
Serum Creatinine	62 - 115 umol/L
Urea	2.5 - 6.4 mmol/L
Potassium (K)	3.5 - 5.1 mmol/L
Sodium (Na)	135-145 mmol/L
H_2Co_3	Normal

diagnosis

Urinary Tract Infection (UTI), (**Acute pyelonephritis**)

management

- **Do urine culture**. (To confirm the Diagnosis)
- **Urine analysis:** Presence of >105 organisms\ml indicate Bacteruria)
- Perform antibiotic sensitivity test. (The main treatment of UTI is by antibiotics.)
- Initial or empiric therapy : (**ciprofloxacin and diclofenac**)

Urinary Tract infection (UTI)

Lower UTIs
(infections of bladder and urethra)

Cystitis (infection of the bladder; superficial mucosal infections)

Urethritis (sexually transmitted pathogens)

urethritis in men & women

Symptoms:
-frequent urination
-nocturia
-urethritis
-pain in the midline suprapubic region
-pyuria
-hematuria
-pyrexia
-cloudy and foul-smelling urine
some UTIs are asymptomatic

Upper UTIs
(infections of the kidney)

Acute pyelonephritis

Chronic pyelonephritis

Symptoms:
-All of Lower UTIs' symptoms
-Emesis: vomiting
-Back, side (flank) or groin pain
-Abdominal pain or pressure
-Shaking chills and high spiking fever
-Night sweats
-Extreme fatigue

Uncomplicated UTIs : usually occur in **non-pregnant** , young sexually active female **without any structural or neurological abnormality** . the **Risk Factors is**

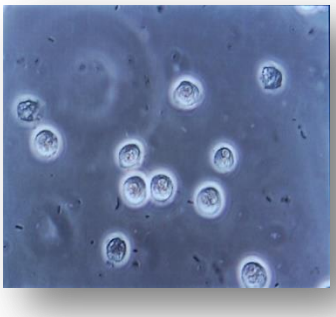
- **Catheterization** of the urinary bladder , instrumentation
- **Structural abnormalities**
- **Obstruction**
- **Hematogenous** through blood stream from other

Complicated UTIs: nosocomial UTIs, relapses, structural or functional abnormalities

Routes of UTIs

1)**ascending route (more common)** uropathogens originate from rectal flora and enter the urinary tract via the urethra into the bladder.
2) **hematogenous route (less common**) secondary to incompletely treated prostatic or kidney parenchymal infections.

organism causing UTI



- **Escherichia coli** : **gram negative rods** (**most bacterial causes**)
- Klebsiella
- Staph aureus : haematogenous spread (rare)
- Candida albicans : fungus

histopathology of pyelonephritis

Acute pyelonephritis: **polymorphonuclear neutrophilic** exudate within tubules & interstitial inflammation.
Chronic pyelonephritis: **glomerulosclerosis,periglomerular fibrosis**(fibrin exudate), interstitial chronic inflammatory cells infiltrate(**lymphocytes & plasma cells**), tubules thyroidization.

Treatment of urinary tract infection

Uncomplicated UTIs
• Can be treated at home with oral antibiotics for 10-14 days with one of the followings:
- Trimethoprim
- Cephalosporins
- Fluoroquinolone (e.g., **Ciprofloxacin**)
- Amoxicillin

A urine culture may be obtained within one week of completion of therapy and again after 4 weeks.
Acute pyelonephritis:
• Patients need hospitalization.
• Antibiotic given by **IV route** for 3-5 days until symptoms relieved for 24-48 hrs. Then, you stop IV and discharge patient with **oral antibiotics** (e.g. Ciprofloxacin, Ceftriaxone).

Questions

1-What is a Urinary tract infection?
A bacterial infection that affects any part of the urinary tract.

2-What could be the expected diagnosis for this case?
Urinary tract infection (Acute Pyelonephritis)

3-What are the risk factors?

- Urinary tract abnormalities.
- Blockages in the urinary tract.
- Suppressed immune system.
- Using a catheter.
- Female.
- Diabetes.

4-What kind of a symptom is seen in kidney infection (pyelonephritis) but not seen in bladder infection (cystitis)?
Emesis: vomiting is common.

5-What are the routes of infection?

- Ascending infection.
- Hematogenous infection.

6-What is the most common organism responsible for this kind of infection?
Escherichia coli (70-80%)

7-What could are the microscopic findings that are indicative of the patient having a UTI?
-Multiple bacilli shown between the white blood cells (Bacteriuria & Pyuria.)

8-When suspecting that the patient has UTI you should?

- Urine culture. (To confirm the Diagnosis) Urine analysis: Presence of >105 organisms\ml indicate Bacteriuria).
- Perform antibiotic sensitivity test. (The main treatment of UTI is by antibiotics).
- Initial or empiric therapy: (ciprofloxacin and diclofenac).

9- what are the additional findings in acute pyelonephritis?
Fever – flank pain – nausea.

10-Why is the incidence of UTI greatly increased in women and pregnant woman in particular?
Because of the short female urethra, and it increases during pregnancy because of pressure by the uterus.

11-How could you prevent the occurrence of UTI?
-Good hygiene for males and females.
-Drinking plenty of liquids, especially water.

12-What is the most appropriate antibiotic to treat this case?
Ceftriaxone (3rd G cephalosporin)

Name three of the most common organisms that cause UTI?
1-E.Coli
2-Klebsiella spp.
3-Proteus vulgaris.

Thank you for choosing to study from our work. Here's hoping it was to your satisfaction!

AbdulAziz AlSaud
Leena AlJurf
Abdulrahman Almutairi
Ahad Alanzi
Asma alrossais
Ibrahim Alnajashi
Kholoud Alanzi
Nasser Alqhtani
Najd AlOmran
Nourah Al-Beeshi
Hussain Al-Kaff

Best wishes,
The PBL team