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A REVIEW ARTICLE TO UNDERSTAND THE CONCEPT OF PYELONEPHRITIS

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ABSTRACT

The job of kidney is purification of body and maintains electrolyte balance in the body. But due to unhealthy diet and certain genetic conditions kidney get infected and causes certain types of disease problems in the body. Here in this article we are discussing all the causative factors and treatment protocol for Pyelonephritis.

INTRODUCTION

Pyelonephritis is defined by inflammation of the kidney parenchyma and the renal pelvis, typically due to bacterial infection. Acute pyelonephritis can affect patients of all ages, however the highest incidence occurs in women aged 15-29. Pyelonephritis can be described as uncomplicated, when present in a structurally or functionally normal urinary tract in a non-immunocompromised host, or complicated*, when the opposite is true.

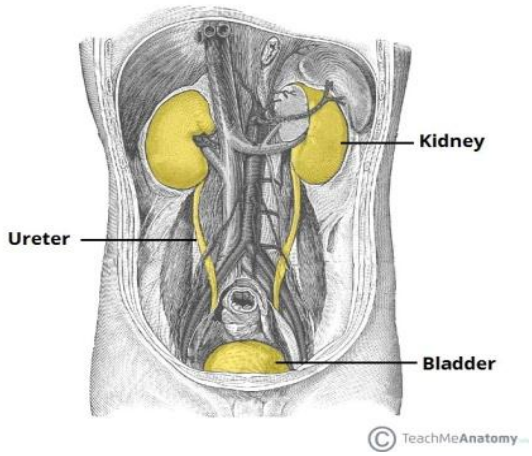

Fig. 1: - The Urinary tract.

**Urinary tract infections in males are complicated by definition, as they will be associated with abnormal urinary tracts.*

Acute pyelonephritis is a sudden and severe kidney infection. It causes the kidneys to swell and may permanently damage them. Pyelonephritis can be life-threatening. When repeated or persistent attacks occur, the condition is called chronic pyelonephritis. The chronic form is rare, but it happens more often in children or people with urinary obstructions.

Symptoms

Symptoms usually appear within two days of infection. Common symptoms include:

- A fever greater than 102°F (38.9°C)
- Pain in the abdomen, back, side, or groin
- Painful or Burning Urination
- Cloudy urine
- Pus or Blood in Urine
- Urgent or frequent Urination
- Fishy-smelling urine

Other symptoms can include:

- Shaking or chills
- Nausea
- Vomiting
- General aching or ill feeling
- Fatigue
- Moist skin
- Mental confusion

Symptoms may be different in children and older adults than they are in other people. For example, mental confusion is common in older adults and is often their only symptom. People with chronic pyelonephritis may experience only mild symptoms or may even lack noticeable symptoms altogether.

Patho-physiology

- Acute pyelonephritis results from bacterial infection of the renal pelvis and parenchyma. Bacteria can reach the kidney either by ascending from the lower urinary tract, directly from the blood stream, as in cases of septicaemia or infective endocarditis or, rarely, via lymphatics (as seen in cases of retroperitoneal abscess).
- Neutrophils infiltrate the tubules and interstitium and cause suppurative inflammation. There are often small renal cortical abscesses and streaks of pus in the renal medulla.

- The most common organism* (~80%) isolated is Escherichia coli. Other organisms include, Klebsiella, Proteus, Enterococcus faecalis (catheters), Straphylococcus aureus (catheters), Staphylococcus saprophyticus (commensal), and Pseudomonas (cathethers).

Clinical features

- The classical triad for pyelonephritis is of fever, unilateral loin pain (or rarely bilateral), and nausea & vomiting, typically developing over the course of 24-48 hours.
- Patients may also have symptoms of co-existing lower urinary tract infection (frequency, urgency, dysuria), as well as visible (or non-visible) haematuria.
- On examination, patients will often look unwell, often pyrexial and features of sepsis. They will have unilateral or bilateral costovertebral angle tenderness*, with or without suprapubic tenderness.

Kidney tests

- **Urinalysis:** A routine test of the urine by a machine and often by a person looking through a microscope. Urinalysis can help detect infections, inflammation, microscopic bleeding, and kidney damage.
- **Kidney ultrasound:** A probe placed on the skin reflects sound waves off the kidneys, creating images on a screen. Ultrasound can reveal blockages in urine flow, stones, cysts, or suspicious masses in the kidneys.
- **Computed tomography (CT) scan:** A CT scanner takes a series of X-rays, and a computer creates detailed images of the kidneys.
- **Magnetic resonance imaging (MRI) scan:** A scanner uses radio waves in a magnetic field to make high-resolution images of the kidneys.
- **Urine and blood cultures:** If an infection is suspected, cultures of the blood and urine may identify the bacteria responsible. This can help target antibiotic therapy.
- **Ureteroscopy:** An endoscope (flexible tube with a camera on its end) is passed through the urethra into the bladder and ureters. Ureteroscopy generally cannot reach the kidneys themselves, but can help treat conditions that also affect the ureters.
- **Kidney biopsy:** Using a needle inserted into the back, a small piece of kidney tissue is removed. Examining the kidney tissue under a microscope may help diagnose a kidney problem.

Kidney treatments

- **Antibiotics:** Kidney infections caused by bacteria are treated with antibiotics. Often, cultures of the blood or urine can help guide the choice of antibiotic therapy.
- **Nephrostomy:** A tube (catheter) is placed through the skin into the kidney. Urine then drains directly from the kidney, bypassing any blockages in urine flow.
- **Lithotripsy:** Some kidney stones may be shattered into small pieces that can pass in the urine. Most often, lithotripsy is done by a machine that projects ultrasound shock waves through the body.
- **Nephrectomy:** Surgery to remove a kidney. Nephrectomy is performed for kidney cancer or severe kidney damage.
- **Dialysis:** Artificial filtering of the blood to replace the work that damaged kidneys can't do. Hemodialysis is the most common method of dialysis in the U.S.
- **Hemodialysis:** A person with complete kidney failure is connected to a dialysis machine, which filters the blood and returns it to the body. Hemodialysis is typically done 3 days per week in people with ESRD.
- **Peritoneal dialysis:** Placing large amounts of a special fluid in the abdomen through a catheter allows the body to filter the blood using the natural membrane lining the abdomen. After a while, the fluid with the waste is drained and discarded.
- **Kidney transplant:** Transplanting a kidney into a person with ESRD can restore kidney function. A kidney may be transplanted from a living donor, or from a recently deceased organ donor.

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