

(1)

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Q1 What is the role of Nuclear medicine in diagnosis and treatment of thyroid diseases?

NUCLEAR MEDICINE is

is the branch of medicine concerned with the use of radionuclides in the study and the diagnosis of diseases.

- The radionuclides are used for:
 - 1 the assessment of organ function.
 - 2 the detection of diseases
 - 3 the treatment of diseases and the monitoring of the effects of treatment.

Ex:

The use of isotopes in diagnosis.

- Tracers - small amount of radioactive substances used as probes to study internal organs.

- Nuclear imaging is medical techniques involving tracers.

Ex

- Iodine concentrates in the thyroid gland.

(2)

- Using radioactive ^{131}I and ^{125}I will allow the study of how the thyroid gland is taking in iodine.

Thyroid disease treatment:

If you have high level of thyroid hormones (hyperthyroidism) treatment options can include.

- Anti-thyroid drugs (methimazole or propylthiouracil). These are medications that stop your thyroid from making hormones.
- Radioactive iodine: This treatment damages the cells of your thyroid, preventing it from making high levels of thyroid hormones.
- Beta blockers: These medications don't change the amount of hormones in your body, but they help control your symptoms.
- Surgery: A more permanent form of treatment, your healthcare provider may surgically remove your thyroid. This will stop it from creating hormones. However, you will need to take thyroid replacement hormones for the rest of your life.

(3)

If you have low levels of thyroid hormones (hypothyroidism) the main treatment option is:

- Thyroid replacement medication. This drug is a synthetic (man-made) way to add thyroid hormones back into your body. One drug that's commonly used is called levothyroxine, you can control thyroid disease and live a normal life.

Q2 What do you know about polycystic kidneys?

POLYCYSTIC KIDNEY DISEASES :-

- It is a common hereditary disease characterized by development of multiple renal cysts.
- There are two genetically different forms of PKD.
- Autosomal recessive PKD (infantile type)
 - ▷ severe form of PKD.
 - ▷ fatal in infancy due to renal failure and hepatic fibrosis.
- Autosomal dominant PKD (Adult type).
 - ▷ In 50% of cases cause of ESRD in age 60s.

(4)

ADULT PKD / ADPKD: It is a common hereditary disease inherited as an autosomal dominant trait, characterized by development of multiple renal cysts.

CLINICAL FEATURES:

- Often asymptomatic until late in life.
- Insidious onset of HTN after 20ys (250%) may or may not be associated with renal dysfunction.
- Acute loin pain and hematuria, due to hemorrhage into cyst, cyst infection or urinary stone formation (20%).
- Loin or abdominal pain due to increasing size of the kidneys.
- Complications of HTN such as IHD, stroke, HF.
- Complications of hepatic cyst.
- Subarachnoid hemorrhage due to rupture of berry aneurysm.
- Symptoms of uremia due to renal failure.
- on P/E: palpable kidneys.

INVESTIGATIONS:

- Urinalysis = Hematuria, proteinuria.
- U/S of kidneys = diagnostic criteria for ADPKD on ultrasound is as follows:

D Two or more cysts in patients under age of 30ys. etc.

(5)

MANAGEMENT:

management of PKD is actually the management of its complications, which will be discussed as follows.

- Abdominal / Flank pain: bed rest, analgesics for acute pain and cyst decompression for chronic pain.
- Hematuria: Gross hematuria results from rupture of the cyst, renal stone or UTI which usually resolves within 7 days with bed rest and hydration.
- Renal infection: Usually fever, flank pain and leukocytosis is present. Fluoroquinolones are given parenterally for 2 weeks then orally for long term.

PROGNOSIS:

- Renal failure cannot be prevented with medical treatment. Treatment of HTN and low protein diet may slow the progression of disease. Screening of the family members with ultrasound of kidneys is recommended.

Q3 What is lithotripsy? Is it a therapeutic or diagnostic tool? What is general criteria for performing lithotripsy?

LITHOTRIPSY: Lithotripsy is a

6

medical procedure used to treat certain types of kidney stones and stones in the other organs such as gallbladder or liver. Lithotripsy is the use of high energy shock waves to break up stones in the kidney. An Greek word litho means stone trip means break.

- Lithotripsy is a therapeutic tool because through this process we break stones.
- Lithotripsy is a medical procedure that uses shock waves or a laser to break down stones in the kidney, gallbladder or ureter.
- The remaining particles of small stone will exit the body when a person urinates.
- If stones do not pass, they can damage the kidneys and urinary tract. When medications do not help, a lithotripsy procedure can break the stones down into small pieces so they can pass out in the urine.
- The two types of lithotripsy are extracorporeal shock wave lithotripsy and laser lithotripsy.

(7)

- Both procedure can help eliminate both same stones quickly and effectively. The type of treatment a doctor recommends will depend on a range of factors, such as the type of stones and the individual's overall health.

General criteria of performing this procedure:

- Lithotripsy treats kidney stones by sending focused ultrasonic energy or shock waves directly to the stones first located with fluoroscopy or ultrasound.
- The shock waves break waves break a large stone into smaller stones that will pass through the urinary system.

Q4 Describe all the terms used in medical dictionary with suffix "otomy"?

- Amniotomy: An incision created to accelerate labor.
- Androtomy: Dissection of the human body.
- Bilateral cingulotomy: Psychosurgery treatment for depression and addiction.
- Clitoridectomy: Plastic surgery of the clitoral hood.

(8)

- Craniotomy: A bone flap is temporarily removed from the skull to access the brain.
- Episiotomy: Surgical incision of the perineum and the posterior vaginal wall.
- Hysterotomy: Hymenotomy
Surgical removal or opening of the hymen.
- Laminotomy: The partial removal of the lamina.
- Myotomy: procedure in which muscle is cut.
- Osteotomy: A bone is cut to shorten or lengthen it or to change its alignment.
- Phlebotomy: An incision in a vein with a needle.
- Radial keratotomy: A refractive surgical procedure to correct myopia.
- Sphincterotomy: Treating mucosal fissures from the anal canal/sphincter.
- Thyrotomy: incision of the larynx through the thyroid cartilage.

(9)

Q5] What do you know about UTI? Explain.

Urinary tract infection:

A urinary tract infection is an infection in any part of your urinary system - your kidneys, ureters, bladder and urethra.

- Women are at greater risk of developing UTI than are men. Infection limited to your bladder can be painful and annoying.

Symptoms:

- A strong, persistent urge to urinate.
- A burning sensation when urinating.
- Passing frequent, small amounts of urine.
- Urine that appears cloudy.
- Strong-smelling urine.
- Pelvic pain, in women - especially in the center of the pelvis and around the area of the pubic bone.

Causes:

• UTI typically occur when bacteria enter the urinary tract through the urethra and begin to multiply in the bladder.

The most common UTIs occur mainly in women and affect the bladder and urethra.

- Infection of the bladder (cystitis).
Cause by *Escherichia coli*, a type of

(10)

bacteria found in the GI tract.

Sexual intercourse may lead to cystitis but you don't have to be sexually active to develop it.

- Infection of the urethra (urethritis).
This type of UTI can occur when GI bacteria spread from the anus to the urethra.

Risk factors:

Urinary tract infections are common in women and many women experience more than one infection.

- Female anatomy
- Sexual activity.
- Certain types of birth control.
- Menopause.

Complications:

- Recurrent infections, especially in women who experience two or more UTI in a six-month period or year.
- permanent kidney damage from an acute or chronic kidney infection due to untreated UTI.
- Increased risk in pregnant women of delivering low birth weight or premature infants.

11

Prevention:

- Drink plenty of liquids, especially water.
- Drink Cranberry juice.
- Wipe from front to back.
- Empty your bladder soon after intercourse.
- Change your birth control method.