Benha University
Faculty of Science
Department of Zoology

HEALTHY NUTRITION
Uni 152

Lecture 5

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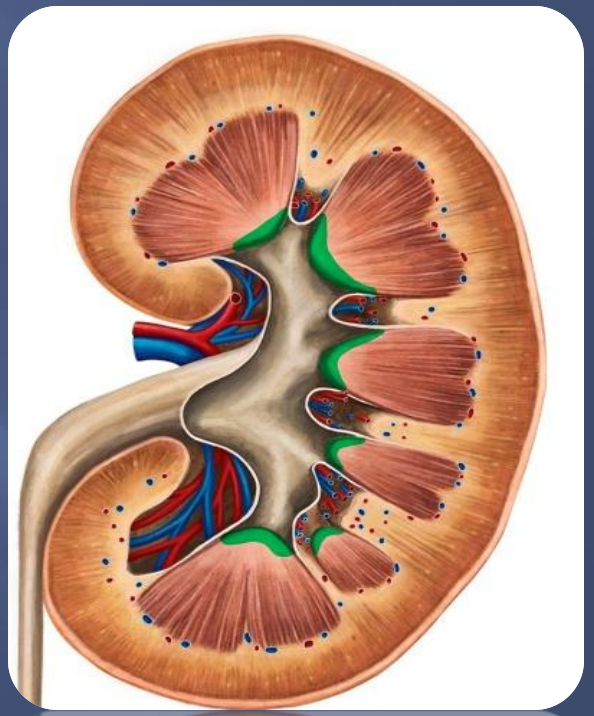
THERAPEUTIC NUTRITION FOR KIDNEY PATIENTS

• The kidney color is reddish brown, resembling a bean seed.

•The kidneys are located on the back wall of the abdominal cavity on both sides of the spine under the diaphragm.

•The kidney excretes about 1 to 2 liters of urine per day, and the least amount of urine that the body can excrete in a day is half a liter, and if the amount of urine is less than that, it becomes difficult to get rid of harmful substances in the body, and this condition is called oliguria.



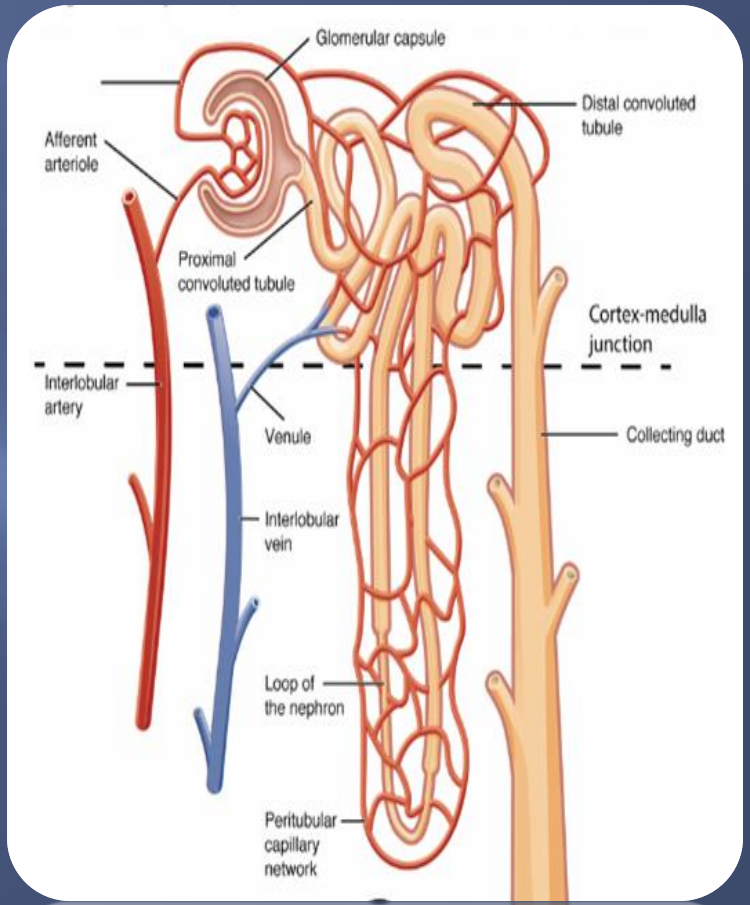
Kidney functions

1. It is the body organ responsible for emptying, regulating and retaining nutrients and water in the body.
2. Excreting harmful metabolic products.
3. Adjusting the acid-base balance.
4. Excreting drugs, toxins and hormones.
5. Regulating blood pressure.
6. Producing the hormone erythropoietin.
7. Maintaining the balance of calcium and phosphorus in the bones.
8. Adjust the salt balance.

Nepheron

• Nephron is the functional unit of the kidney.

•The nephron consists of renal bundles of blood capillaries called glomeruli, and each glomerulus is surrounded by a capsule connected to a bundle of small tubes, and these tubes open into collecting tubes that reach the renal pelvis and then to the ureter.



Checkpoint

What is the primary cause of acute cholecystitis?

A) Bacterial infection
B) Blockage of the biliary system by stones
C) Excessive fat consumption
D) Liver cirrhosis

Which of the following dietary recommendations is correct for managing chronic cholecystitis?

A) Completely eliminating fat from the diet
B) Limiting fat intake to 25% of total daily energy
C) Increasing protein intake to 100g per day
D) Consuming only liquid foods indefinitely

ACUTE NEPHRITIS

An infection caused by bacteria reaching the kidneys through the blood or reproductive system.

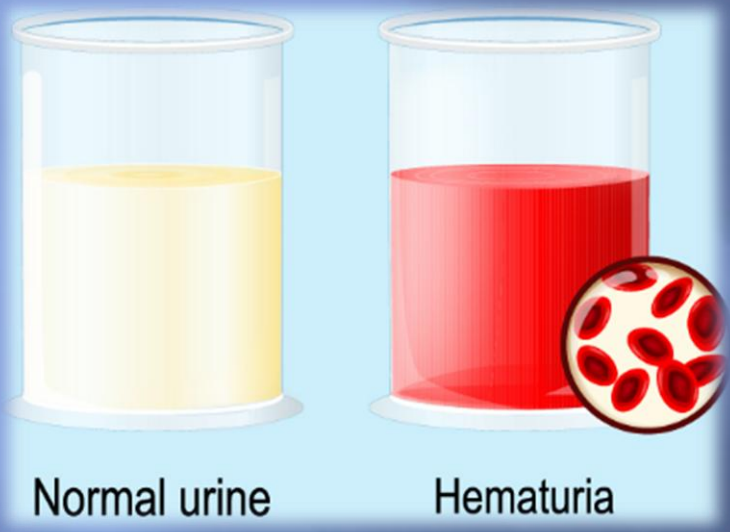
- **Leads to kidney inflammation affecting the glomeruli.**

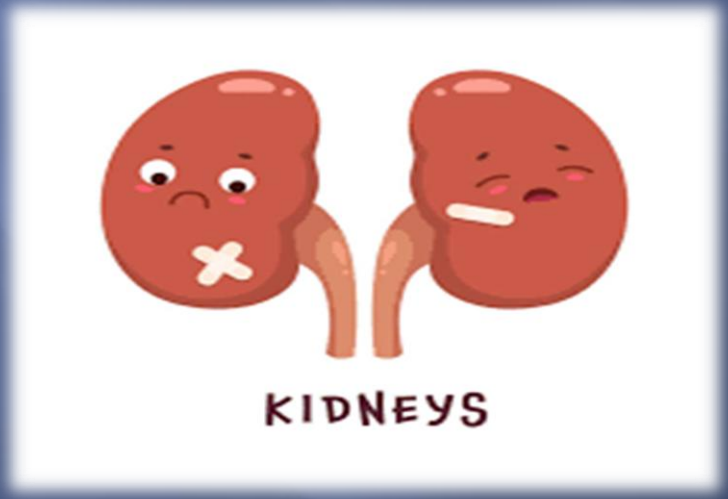
- **Occurs suddenly and lasts for a short period.**

- **Can result in:**

1. **Complete recovery**
2. **Chronic nephritis**
3. **Kidney failure**

Symptoms of acute nephritis





Nutritional Care

Medical opinions differ on dietary restrictions:

- **Some say no need to limit protein or potassium unless hematuria or hyperkalemia is excessive.**

- **Others prefer early restriction of protein and potassiu.**

- **Sodium intake should be limited due to high blood pressure**

- **Treatment also involves addressing the primary cause of the disease.**

ACUTE RENAL FAILURE

- Sudden decrease in kidney filtration rate
- Kidneys fail to excrete harmful metabolic waste
- Recovery possible within 2-3 weeks or may worsen

Urine output:

Less than 0.5L/day (oliguria)

Normal volume in some cases

Causes of acute renal failure

1. Pre-renal causes:

- Due to shock from accidents, burns, dehydration
- Severe blood and fluid loss

2. Renal causes:

- Diseases affecting kidneys
- Medication toxicity or poisoning

3. Post-renal causes:

Urinary tract obstruction due to enlarged prostate, bladder tumors, or ureter narrowing

Stages of acute renal failure

1. First stage (Low urine output):

- Severe tissue damage
- Low urine output
- High urea
- pH imbalance
- Excess potassium excrtion

2. Second stage (High urine output):

- Large urine volume excreted
- Risk of losing sodium and potassium
- Requires electrolyte replacement

Nutritional Care

- Nutritional treatment aims to control dietary protein, phosphorus, sodium, potassium and fluids.
- In the first stage of acute renal failure, the patient's therapeutic nutrition is limited to intravenous nutrition.

Nutrient considerations

1. **Protein:** Patient is given in the first stage an intravenous solution of glucose and essential amino acids.
2. **Energy:** The body's energy needs increase.
3. **Fluids:** Balance between intake and loss from the body
4. **Sodium:** Based on its urine excretion and it limited in the first stage of acute renal failure.
5. **Potassium:** Limited in the first stage of acute renal failure and depends on dialysis

CHRONIC RENAL FAILURE

- Gradual damage to kidney tissue over time

The most cases are:

- Diabetes
- Kidney infections
- High blood pressure

Symptoms of chronic renal failure

- Retention of metabolic products.
- Imbalance of fluids and electrolytes in the body.
- Imbalance in hormone production.
- Symptoms of uremia (hyperuremia): Lethargy, general weakness, nausea and vomiting, muscle cramps, a metallic taste in the mouth, and inefficiency of the nervous system with the occurrence of anemia, bone pain, and high blood pressure.
- Blood urea nitrogen reaches more than 100 mg/dL, or blood creatinine reaches 10-12 mg/dL.

Nutritional Care

Nutritional care for these patients usually requires the expertise of an integrated team of doctors, nutritionists, and nurses specialized in this field.

Fluid and sodium balance: **The amount of sodium and fluids given is modified according to urine output, blood pressure, edema, and blood sodium levels.**

Potassium: **Limit potassium-rich foods as citrus fruits, legumes, bananas, tomatoes, nuts, and chocolate. Diuretics help remove excess potassium.**

Protein: **Controlling the amount of dietary protein.**

Calcium & Phosphorus: The amount of calcium and phosphorus in the diet must be controlled very carefully to avoid problems resulting from increased levels of parathyroid hormone, increased blood phosphorus, and hypocalcemia.

Vitamin D: Calcitriol (active Vitamin D) given with caution to prevent calcium deposits in joints & body tissues.

Iron: Chronic renal failure is accompanied by anemia. Treatment by iron supplements (oral or injection), with human erythropoietin.

Carbohydrates: Glucose tolerance may decrease due to nitrogenous compounds interfering with insulin. No dietary intervention is needed for carbohydrates or insulin.

Fat: Chronic renal failure is accompanied by blood lipid disorders leading to increased risk of heart disease. Increase unsaturated fats and regular exercise program is advised.

Checkpoint

……. is the primary cause of acute nephritis.

a) Viral infection
b) Transmission of bacteria to the kidneys
c) High sugar intake
d) Autoimmune disorders

…….. is a pre-renal cause of acute renal failure.

a) Kidney infections
b) Dehydration and blood loss due to accidents
c) Enlarged prostate
d) Use of nephrotoxic medications

Chronic renal failure is accompanied by……..

a) anemia
b) heart disease
c) hepatitis
d) a & b

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