



Case 4: I feel tired



New terms

- Itching: a sensation that causes the desire or reflex to scratch
- Retinopathy: due to persistent or acute damage to the retina of the eye
- Shifting dullness: is a clinical sign that may indicate ascites.
- Pericardial effusion: abnormal accumulation of fluid in the pericardial cavity
- Dietitian: is an expert in food and nutrition
- Ascites: accumulation of fluid in the peritoneal cavity
- Echogenic: the ability to bounce an echo.
- Hemodialysis: a method that is used to achieve the extracorporeal removal of waste products such as creatinine and urea and free water from the blood when the kidneys are in a state of renal failure
- Peritoneal dialysis: a treatment for patients with severe chronic kidney disease
- Asterisks: a tremor of the hand when the wrist is extended
- Seizures: are brief episodes of abnormal excessive or synchronous neuronal activity in the brain.
- Baseline: Initial known value which is used for comparison with later data.

Scenario

A 57 year old man presented with 2 months history of **fatigue, loss of appetite** and **itching**. He has had **type 2 diabetes mellitus** and **hypertension** for 16 years, and was recently diagnosed with **hyperlipidemia**. He has **retinopathy** and **diabetic nephropathy**. About 8 months ago, his **baseline creatinine** was 460µmol/L.

Examination

- The patient is not distressed.
- Lower limb → Edema bilaterally.
- Abdomen → Distended – Positive shifting dullness for ascites.
- Ultrasound → bilateral echogenic kidneys of normal size.
- CBC → red blood count reduced to 3.5 (normal 5.05-5.5)
- Vitals sign shows :hypertension

Investigation

Renal Function test

Creatinine	670 µmol/L	↑ "INCREASED"
Urea	36 mmol/L	↑ "INCREASED"
Potassium	6.2 mmol/L	↑ "INCREASED"
H ₂ CO ₃	12 mmol/L	↓ "DECREASED"
PO ₄	2.1 mmol/L	↑ "INCREASED"
Ca	2.1 mmol/L	↓ "DECREASED"

24 hours Urine Analysis:

Protein	+3	Proteinuria
WBC	3/hpf	Infection

Diagnosis

End stage renal disease ESRD (Chronic Kidney Disease) (stage 5). Due to long standing uncontrolled diabetes and hypertension.

Management

•for the end stage renal disease

Kidney transplantation (the optimal treatment) and **Hemodialysis**

Peritoneal dialysis

- orders more investigation:

PTh (parathyroid hormone), Ferritin, B12 level, Folate level and Serum iron.

- Amlodipine (antihypertensive): 5mg po od. –
- Ferrus fumerate: 200mg po bid → is used to treat iron deficiency anemia.
- -Calcium carbonate: 600 mg pot id, with meals→ used when the amount of calcium taken in the diet is not enough.
- One alpha calcidol: Is a type of vit D, used to promote healthy bones
- Erythropoietin: 60 mcg s/c every 2week

Chronic kidney disease (CKD)

is a structural or functional abnormality of the kidneys for 3 months or more.

Signs

-uremia

-anemia

-abnormal calcium & phosphate metabolism

symptoms

-neurological system: cognitive impairment, personality change, asterixis

Gastrointestinal: nausea, vomiting

-Hematological: **anemia** due to **erythropoetin deficiency**, easy bruising and bleeding due to abnormal platelets function

-Pulmonary system: shortness of breath, **pulmonary edema**

-Cardiovascular system: chest pain due to pericarditis and pericardial effusion

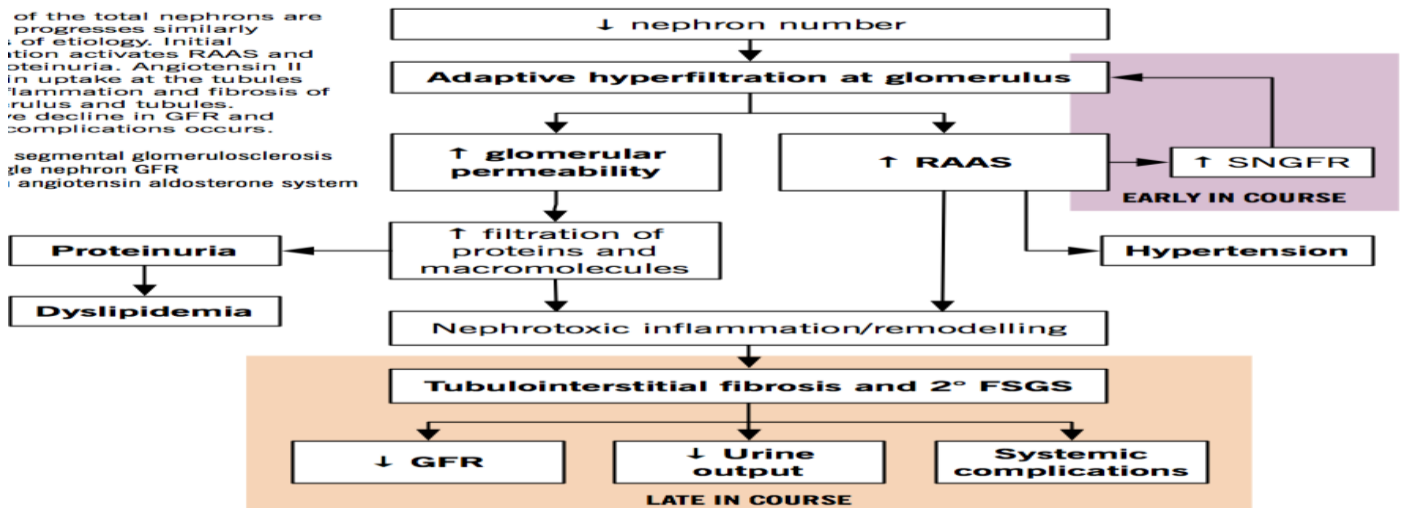
-Skin: generalized **itching and dry skin**

symptoms appear when the **GFR start to go below 30 mL/min**

Pathophysiology (mechanism)

of the total nephrons are progresses similarly of etiology. Initial ition activates RAAS and steinuria. Angiotensin II in uptake at the tubules lammation and fibrosis of rulus and tubules. re decline in GFR and complications occurs.

segmental glomerulosclerosis le nephron GFR i angiotensin aldosterone system



Complication

Anemia ,Hyperparathyroidism Hypocalcemia Hyperphosphatemia Hyperkalemia Metabolic Acidosis

Treatment

- Prevent **cardiovascular events and death** (Heart Attacks, Congestive Heart Failure, sudden cardiac arrest, Stroke)
- Prevent the **prognosis of CKD** to Kidney Failure **or ESRD**
- Prevent complications of CKD
- Treat complications of CKD

1- **Anemia: by Iron supplements , Erythropoietin**

2- **Calcium/Phosphate and bone diseases:** by Dietitian for diet modification, **Calcium carbonate** **One alpha calcidol**

3- **Hyperkalemia** ; Dietitian for diet modification

4- **Metabolic acidosis;** Dietitian for diet modification , **Sodium bicarbonate**

- Control diabetes and **hypertension**
- Prepare for dialysis/transplantation in a timely manner
- treatment of ESRD, which includes:

1) **renal replacement therapy:** Hemodialysis (3 times a week, each session 4 hours) Peritoneal dialysis (done at home)

2) **Kidney transplantation** (the optimal treatment)

Difference between Acute and chronic kidney diseases

	<i>Acute</i>	<i>Chronic</i>
History	Days-weeks	Months-years
Hemoglobin concentration	Normal	Low
Renal size	Normal	Reduced
Serum creatinine concentration	Acute reversible increase	Chronic irreversible

Questions

1-What is your possible diagnosis for this case?

-Chronic kidney disease (CKD).

2-Define chronic kidney disease (CKD)?

Structural or functional abnormalities of the kidney for ≥ 3 months

3-The National Kidney Foundation (NKF) defines according to what?

-Presence or absence of kidney damage.

-Level of kidney function.

4-What are the causes of chronic kidney disease (CKD)?

1. Glomerular disease.

2. Vascular disease.

3. UTI urinary tract infection.

4. Genetics and congenital disease (Such as: PKD.)

5. Recurrent kidney stone disease.

6. Unrecovered acute kidney injury.

5-What are the risk factors of CKD?

• Diabetes

• High blood pressure

• Heart disease

• High cholesterol

• Smoking

• Obesity

6-List some of the markers of kidney damage?

-Blood or urine abnormalities.

-Proteinuria.

-Imaging tests (Extensive scarring).

7-What is the best overall index of kidney function in health and disease?

-Glomerular filtration rate (GFR).

8-The GFR varies according to?

-Age.

-Gender.

-Body size.

9-What is a specific indication of CKD?

-A persistently reduced GFR.

10-When does CKD patients produce symptoms?

When renal function is below 30 mL/min.

11-What are the symptoms of CKD?

-Edema.

-Loss of appetite.

-Itching.

-Reduced level of urine.

12-Complications developing in CKD patient when their renal function is reduced?

-Anemia.

-Hyperparathyroidism.

-Hypocalcaemia.

-Hypophosphatemia.

-Hyperkalemia.

-Metabolic acidosis.

13-Name the organ systems which the uremic symptoms can affect and give an example for each?

-Neurological system: Personality change.

-Gastrointestinal system: Vomiting.

- Hematological: Easy bruising and bleeding due to abnormal platelets function.
 - Pulmonary system: Shortness of breath and pulmonary edema.
 - Cardiovascular system: Chest pain due to pericarditis and pericardial effusion.
 - Skin: Generalized itching and dry skin.
- 14-The staging system for CKD is based on what?
- Estimated Glomerular Filtration Rate (eGFR).
- 15-The CKD staging system is composed of how many stages?
- Five.
- 6-How is it possible to distinguish Acute and chronic renal failure?
- By comparing prior test results.
- 18-What is the primary goal for treatment of CKD?
- To prevent cardiovascular events (CHF, heart attack & stroke) and death.
- 19-What are the options for treatment of End stage renal disease (ESRD)?
- Renal replacement therapy.
 - Kidney transplantation.
- 20-Types of renal replacement therapy are?
- 1) Hemodialysis.
 - 2) Peritoneal dialysis.
- 21-List three possible diseases ending up with CKD?
- Congenital diseases such as PKD.
 - Repeated urinary tract infections.
 - Autoimmune diseases such as: SLE.

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

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Best wishes,
The PBL team