

Kidney Diseases

Kidneys' function:

1. Maintenance of:
 - Acid/base balance
 - water/electrolytes
 - Blood pressure

2. Metabolism of:
 - Vitamin D
3. Synthesis of erythropoietin

Tests:

1. **GFR : glomerular infiltration rate** → the amount of fluids filtrated by kidney/min
 - Normal value :80-100ml/minute
 - 60-75% decreased function,damage reserved to specific part of the kidney
 - 25-40%: renal insufficiency
 - 20-25%:end stage renal disease
 - <20%: renal failure
2. **BUN:** blood urea nitrogen
normal value :10-20 mg/dl.
3. **Urine analysis:** we check PH, colour RBC, WBC.
4. **Electrolytes** (Na, K , p ,Ca)
5. **Creatinin.**

Chronic Renal Failure:

Progressive irreversible reduction of GFR over a period of months to years

Clinical features:7



CV: HTN, CHF



GI: n&v ,
Peptic ulcer → due
hypercalcemia



Neurological:
leathergy, headache,
tremor

Dermatological:

itching , hyperpigmentation
(mucosa+skin)



Hematological :

↑ bleeding

↑ infection

Anemia



Mucoskeletal:

Renal osteodystrophy lead
to growth retardation

Metabolism:

Thirst, polyuria, secondary
hyperparathyroidism

Classification: 5 stages

1 → kidney damage with
normal GFR → 90%

2 → mild ↓ GFR 60-90%

3 → moderate ↓ 30-60%

4 → severe ↓ 15-30%

5 → ↓ than 15% kidney
failure require dialysis or
transplant

Causes :

or

- DM
- HTN

Specially uncontrolled

Others:

- Glomerulonephritis
- Polycystic kidney
disease
- Reno-vascular
disease
- idiopathic

Managment:

- Diet:

↓ fluid intake

Restrict protein intake

↓ intake of Na, Cl, Al, Mg,
P, K

- diuretics → maintain
fluid balance
- Control blood
pressure

Dialysis

** Removes fluid and wastes and equilibrate electrolytes and acid-bases

**Relies on the patient's blood being exposed to a solution hypotonic in metabolites (dialysate) across a semi-permeable membrane.

Peritoneal dialysis	Haemodialysis
at home	at the hospital
A dialysis catheter is surgically placed into the peritoneum(part of body surround intestine)	a vascular access is achieved by forming an arteriovenous fistula.
Peritoneum is the semipermeable membrane and is used for access.	uses an artificial kidney that circulates blood along a semipermeable membrane.
performed by the patient four to five exchanges a day.	performed three times a week; each session is for about 4 hours.
Used for ptn can't move , very obese, Don't have access for hospital	*Heparin is used to prevent activation of the clotting cascade by dialysis membranes(anticoagulant)

Renal transplant

Complications:

↑ incidence of CVD

↑ incidence of malignancy

• Drugs Side effects:
Immunosuppression

Oral manifestations of RT immunosuppressive drugs :

↑ oral infections

Hairy leukoplakia

Gingival hyperplasia bcoz of:

1. Cyclosporin
2. Adalat
3. Phenytoin

↑ incidence of malignancies
skin, lymphoma, lip cancer

Oral manifestations of renal disease :8

Halitosis → ↑ urea and ammonia in blood

Xerostomia → antihypertensive drugs

Metallic taste → ↑ blood urea + PH

Mucosal Pallor → Anemia

Uremic stomatitis → End stage: erythema+ulceration

Petechia + ecchymosis → induced platelet dysfunction

Delayed eruption + enamel hypoplasia

Salivary gland swelling in dialysis

Oral manifestation xray of renal osteodystrophy:

(usually associated with dialysis patients):

- Osteoporosis, osteolytic areas on bone
- ↓ bone trabeculation
- Loss of lamina dura
- Ground glass appearance → Paget's disease
- 2nd hyperparathyroidism → brown tumour

Dental Treatment:

Complicated by:

- ↑ bleeding tendency → heparin or platelet dysfunction
- Anemia → ↓ erythropoietin
- Associated co-morbidities: DM, HTN, CHF
- dysrhythmias → hyperkalemia
- Impaired drug excretion
- ↑ susceptibility to infection
- Blood born infections
- Immunosuppressive therapy
- Anemia+electrolytes disturbance complicate GA

Management:

- Consultation
- Treat the day after dialysis
- Bleeding time-INR-PT-PTT before surgical procedures
- Antibiotic prophylaxis before surgery
- corticosteroid cover with systemic steroid patients before surgery
- Early aggressive treatment of odontogenic infection
- Avoid the hand used for A-V fistula for taking blood pressure, IV sedation or venipuncture
- **Avoid NSAID, ASPRIN, tetracylin → nephrotoxic**
- **Paracetamol+ opioids are safe**
- **LA is safe**
- **Antibiotics dose reduced according to GFR (erythromycin is preferred)**

3 situations:

Patient with mild chronic renal failure/ or Patients on peritoneal dialysis:

- Consult physician to determine the stage of the disease
- Be aware of associated co-morbidities such as diabetes and hypertension
- Avoid nephrotoxic drugs (NSAIDs, tetracycline, aminoglycosides), and adjust drug dosage according to GFR
- Consider bleeding tendency especially if invasive dental procedure is planned (arrange BT, hemostatic measures).

***Patients on peritoneal dialysis:**

- Same previous guidelines +
- Treat the day after dialysis
- Avoid trauma to A-v fistula
- Drug dosage according to GFR
- Prophylactic antibiotics before surgery to prevent infection of A-V fistula.
- Cross infection hazard (HBV-HCV-HIV)

Patients with kidney transplant:

****The same previous guidelines +**

- Consider steroid cover ; to prevent infection.
- Consider prophylactic antibiotics; patients are immunosuppressed. [Erythromycin is contraindicated in patients taking cyclosporine because both are metabolized in kidney](#)
- Adjust drug dosage according to GFR
- Examine oral mucosa and skin carefully especially lip; patients have increased risk of malignancy

Nephrotic syndrome:

signs / symptoms:

- Proteinuria
- Hypoalbuminemia
- Hyperlipidemia,
- Hypercoagulability (increased blood concentration of clotting factors) more susceptible thromboembolic event such as MI or CVA, so the patient is given warfarin.

Causes:

- Idiopathic most often.
- Diabetes
- Amyloidosis
- SLE, other autoimmune diseases

Dental treatment:

It's treated as chronic renal failure treatment.

**influenced by the degree of kidney malfunction

** treated with systemic steroids and anticoagulants.

** Patients are more susceptible to infection due to steroid therapy, hypoalbuminemia, and hypogammaglobulinemia prophylactic antibiotics.

** Patients are usually treated with anti-coagulants (warfarin, heparin) to prevent thrombosis

** Treatment is very complicated : even warfarin and heparin is not taken the same as a patient suffering from cardiac condition, we have to manipulate the dose which is very difficult.

**Facial and labial oedema is common finding in these patients (why?)

:hypoproteinemia ;so fluid will shift to the interstitial compartment causing facial edema.