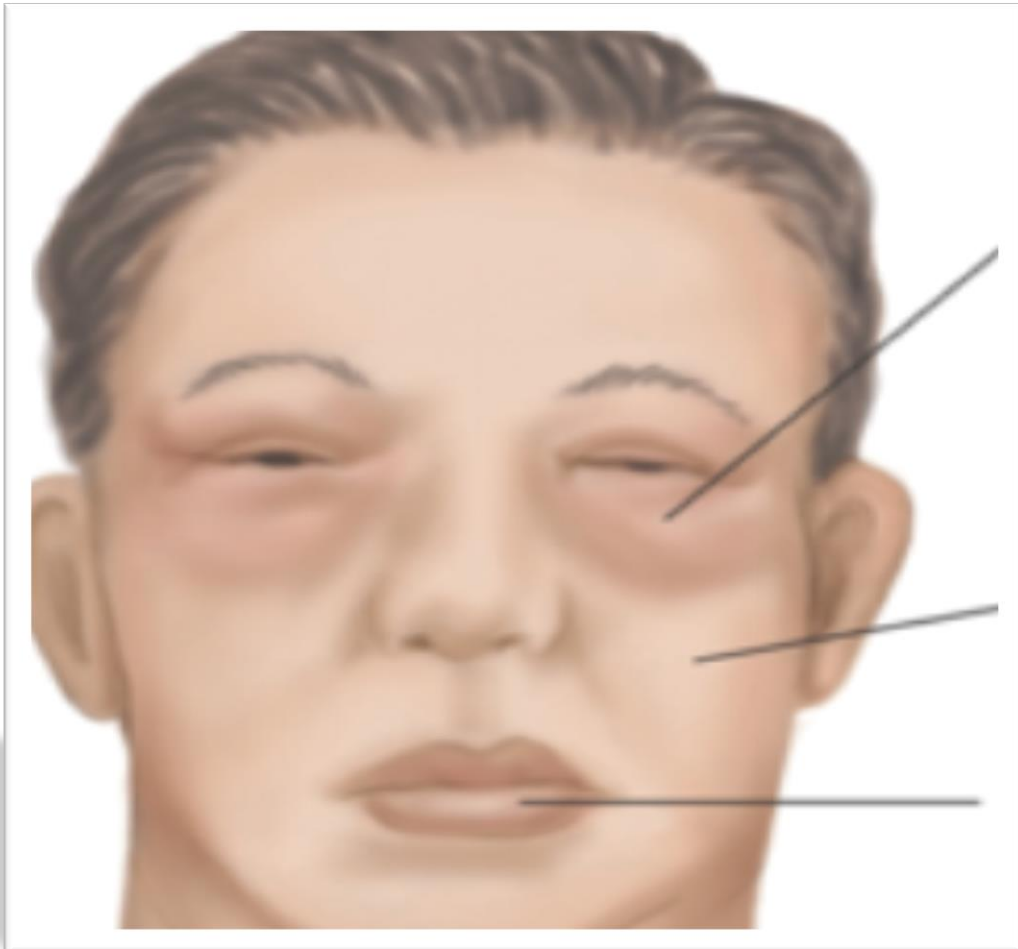




Case 3: My Body is Swollen



New terms:

- **Puffiness:** refers to the appearance of swelling in the tissues around the eyes
- **Frothy urine:** The excess protein in the urine often causes the urine to become foamy
- **Positive shifting dullness:** a sign, discovered on physical examination, for ascites (fluid in the peritoneal cavity)

Scenario

10 years old boy, with a one-week history of **lower limbs swelling**, and **puffiness around the eyes (swelling)** especially *in the morning* was brought to the doctor by his parents. They also noticed that his **urine has been frothy** (foaming) for a few days. His mother stated that the onset of his symptoms was **gradual**. He has no history of relevant medical illness in the past.

Examination:

Vital signs:

- Normal (pulse, BP, temperature, respiratory rate)
- Height: 130cm, weight: 56kg (obese)

Abdomen examination:

- Abdomen is soft and distended (**swelled**) and **positive shifting dullness**

Lower limb examination:

- **Bilateral pitting edema** of both lower limbs, especially in the ankle regions.

Head and neck examination:

- Revealed **puffiness around the eyes**.

Investigation

- **Urine Sample:** **Proteinuria** and **contaminated sample** of epithelial cells
- **Biochemical test:** decreased in **protein** and **albumin**, increased in **cholesterol level**
- **Kidney Biopsy:** **immunoglobulin G** and **immunoglobulin M** deposits in capillaries and **disappear of epithelial** foot process in glomeruli or podocytes

Diagnosis

Nephrotic Syndrome

Management

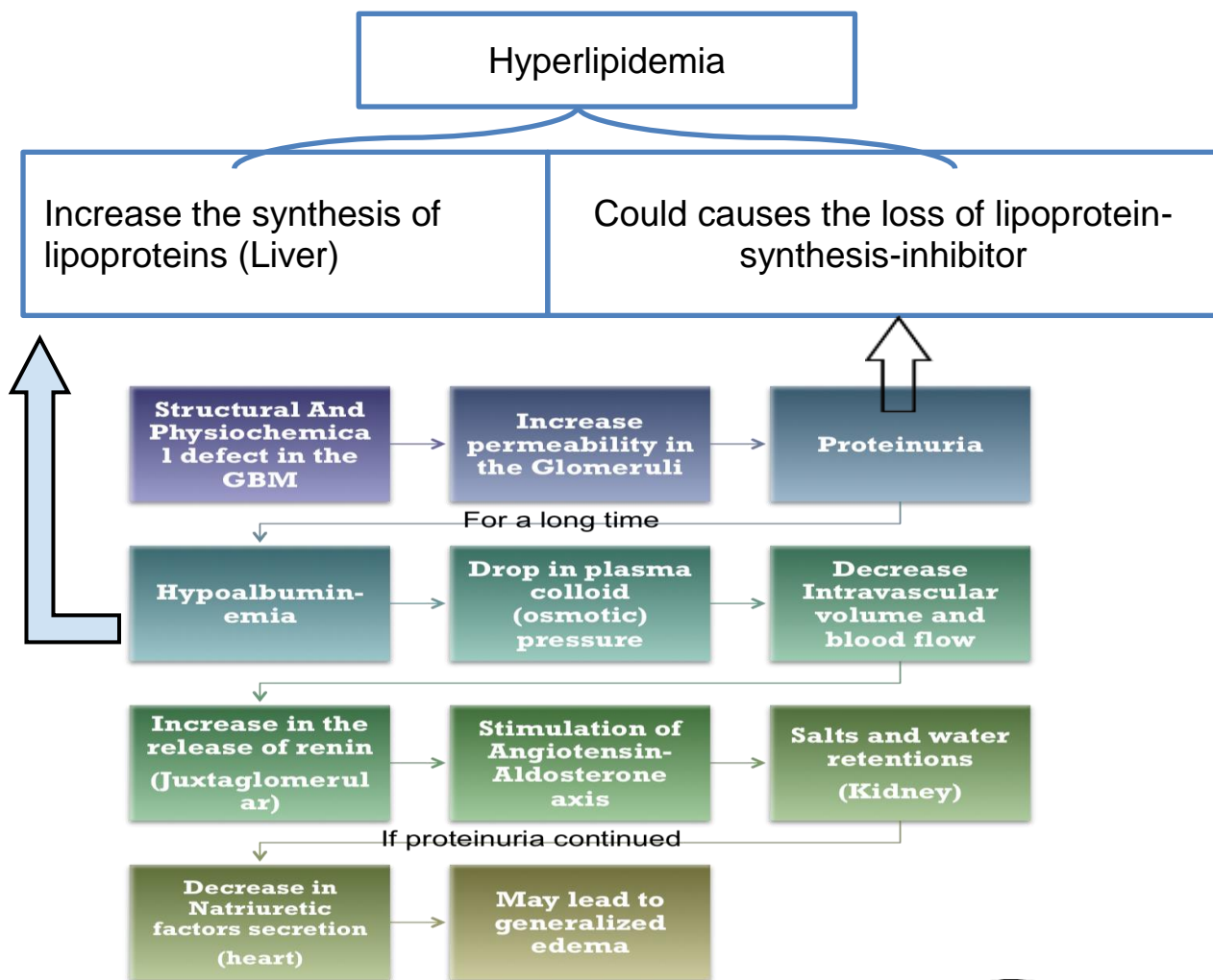
Mohammed started on **prednisolone**. He was started on **furosemide diuretic** and he was advised to reduce **sodium intake to 1000-2000mg/day**.

Nephrotic syndrome

Clinical Presentation

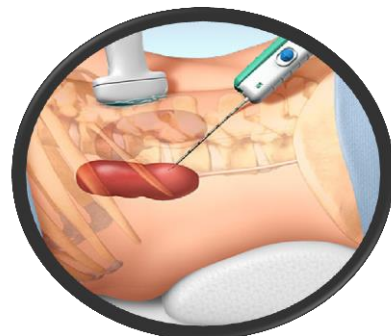
- **Proteinuria more than 3.5 mg/day**,
- **Hypoalbuminemia**
- Hyperlipidemia
- Edema
- Hypertension (rarely)

Pathophysiology



How to diagnosis

- Blood test
- **Urine test**
- Kidney biopsy



Classification

(Primary) diseases

1-Minimal Change Disease:

The glomeruli are normal by LM, but with **diffuse effacement** of foot processes by EM.

2-Focal Segmental GlomeruloSclerosis (FSGS):

FSGS is characterized by obliteration of capillary loops and increased matrix, without deposits and with diffuse foot process effacement by EM, Adhesions can also be present.

3-Membranous Glomerulopathy:

There is no evident proliferation by light microscopy, with global subepithelial deposits, which may be visualized by light microscopy by the glomerular basement membrane

(Secondary) diseases

1. **Membranous nephropathy (MN)** : Hepatitis B - Sjögren's syndrome - Systemic lupus erythematosus (SLE) - Diabetes mellitus - Sarcoidosis - Syphilis - Malignancy (cancer)

2. **Focal Segmental GlomeruloSclerosis (FSGC)**: - Hypertensive nephrosclerosis - HIV - Diabetes mellitus - Obesity - Kidney loss

3. **Minimal change disease (MCD)** - Drugs (NSAIDs) - Malignancy, especially Hodgkin's lymphoma

Management

Treat the symptoms :

1. **Edema**: by **Furosemide** (It is a loop diuretic) and **reduce Na Intake**

2. **Kidney damage**: by **Prednisolone** (It is a corticosteroids)

3. **Hypoalbuminemia**: increase ingestion of **protein rich food**

4. **Hyperlipidemia**: decrease **ingestion of cholesterol**, or **anti-hyperlipidemia** drugs in severe cases (such as **Statins** and **fibrates**)

5-. **Proteinuria**: **Angiotensin-converting enzyme** (ACE) inhibitors and **angiotensin II receptor blockers** are administered to reduce proteinuria

Causes of edema

- ↑ **Capillary hydrostatic pressure**. (e.g. heart failure, local venous block. etc.)
- ↓ **Blood osmotic pressure due to decrease plasma proteins**. (e.g: a- **Nephrotic syndrome**. b- Burns. c- Liver disease d- Malnutrition.)
- ↑ **Capillary permeability e.g.** in allergic reactions & burns.
- **Blockage of lymph return** by, e.g. infection or cancer.

N.B * In our case the cause of edema is due to decrease blood osmotic pressure because there is loss of proteins from blood to urine.

Short Questions

1-What is your possible diagnosis for this case?

Nephrotic syndrome.

2-Define the Nephrotic syndrome?

Is a nonspecific disorder in which the kidneys are damaged, causing them to leak large amounts of protein from the blood into the urine.

3-Nephrotic syndrome is characterized by?

-Proteinuria.

-Hypoalbuminemia.

-Hyperlipidemia.

-Edema.

4-What is the most common sign of the nephrotic syndrome?

It is excess fluid in the body taking several forms.

5-What are the causes of edema?

-↑ Capillary hydrostatic pressure.

-↓ Blood osmotic pressure due to decrease plasma proteins.

-↑ Capillary permeability.

-Blockage of lymph return.

6-When having examinations done we should exclude other causes causing gross edema especially?

The cardiovascular and hepatic system causes.

7-After taking a urine sample it will show?

-Proteinuria.

-Hypoalbuminemia.

-Hypercholesterolemia.

-Electrolytes, urea and creatinine.

8-What further investigations are indicated if the cause is not clear?

-Kidney biopsy.

-Autoimmune markers.

9-The nephrotic syndrome is classified by the etiology and histology into?

-Etiology into: primary and secondary causes.

-Histology into:

A) Minimal change disease (MCD).

B) Focal segmental glomerulosclerosis (FSGS).

C) Membranous nephropathy (MN).

D) Membranoproliferative glomerulonephritis (MPGN).

10-What are the primary causes of nephrotic syndrome that are considered to be “diagnoses of exclusion”?

- Minimal change disease (MCD).

- Focal segmental glomerulosclerosis (FSGS).

- Membranous nephropathy (MN).

11-What could be the secondary cause of minimal change disease (MCD)?

-Drugs.

-Malignancy.

12- Membranous glomerulonephritis is seen in patients with which diseases?

-Diabetes mellitus.

-Systemic lupus erythematosus (SLE).

-Hepatitis B.

-Syphilis.

-Sarcoidosis.

-Malaria infection.

13-What is the type of malignancy that is most probably the cause of minimal change disease (MCD)?

-Hodgkin's lymphoma.

14-A glomerular diseases that mostly affect children are?

-Minimal change disease (MCD).

15-A glomerular diseases that mostly affect adults are?

- Focal segmental glomerulosclerosis (FSGS).

16-The diagnosis is based on?

-Blood and urine tests.

-Sometimes it may require a Kidney biopsy.

17-Diuretics are used for the treatment of?

Edema.

18-What does spike and dome mean?

-Spike: basement membrane material.

-Dome: immune complex deposits.

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

Nourah Al-Beeshi

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Best of luck,

The PBL team