GI

PBL

#1 Lecture 1

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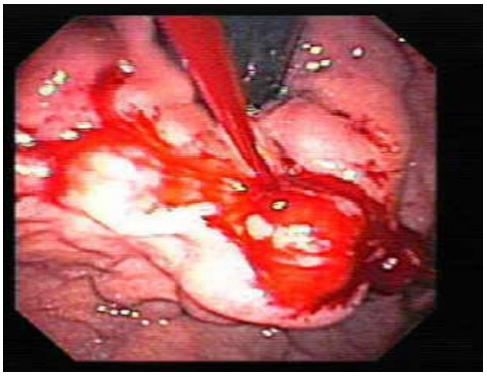
In this lecture we are going to talk about three main topics: upper GI bleeding cirrhosis and portal hypertension and Hepatitis.
What's written in the slides will be in green while the black color will be for what the doctor said and the grey is from google
Let's start with the first topic.

UPPER GI BLEEDING

Firstly, upper GI bleeding means bleeding above the ligament of treitz (above DJ junction), while lower GI bleeding is below the ligament.

Note: this is just anatomical definition (ما اله علاقة بالاعراض) meaning that some symptoms could be the same for upper and lower GI bleeding



Signs and symptoms:

1) Hematemesis: vomiting fresh blood, also the patient may come with Coffee ground vomitus (زي حتل القهوة) if the blood stays for certain time in the stomach with its acidity before the patient vomits.

2) Melena: black tarry stool (offensive in smell, loose stool لانه الدم يعتبر مُسهِل)

Note: melena is not specific for upper GI bleeding it could happen with lower GI bleeding as well, as result of slow transit of blood (يعني الدم اخد وقت وتغير لونه من الاحمر للاسود بسبب انتقاله البطيء)

3) Hematochezia: fresh rectal bleeding (usually it's a sign of lower GI bleeding but if the patient has massive upper GI bleeding he could come with fresh rectal bleeding)

More clarification from the writer for the 2nd and 3rd symptoms (you can skip it easily):

Usually when the patient has upper GI bleeding he will come with black stool because the blood took its time to reach the rectum so its color changed to black but if the patient has massive upper GI bleeding he could have fresh rectal bleeding

On the other hand if the patient has lower GI bleeding he usually comes with fresh bleeding but he also could have black stool as the blood took it time before reaching the rectum and changed its color (it means these symptoms could indicate upper and lower GI bleeding)

4) Dizziness: (usually with posture) as result of hypotension caused by bleeding and anemia

5) Abdominal Pain and symptoms of Peptic ulcer disease: if the cause of the upper GI bleeding is peptic ulcer, there might be NSAID use in the history.

6) Pallor

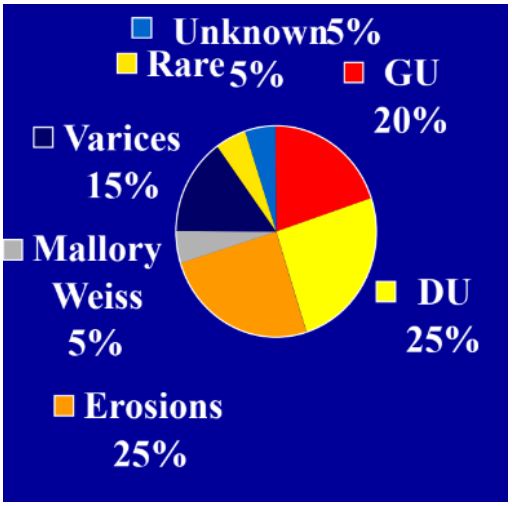
7) Hypotension

8)Orthostasis: (ortho: related to posture) fall in blood pressure when a person transitions from laying down to an upright position ,at early stages of GI bleeding the patient will have orthostasis at later stage he will have hypotension no matter what the patient's posture is .

9) Jaundice and other stigmatas (clinical features) of chronic liver diseases if the cause of upper GI bleeding is esophageal varieceal bleeding

History of NSAID's use (such as ibuprofen, voltarin , nopain and naproxen)
The doctor said NSAIDs have role in every disease (renal failure, ulcers GI bleeding …).

Causes



The most common cause of upper GI bleeding is **peptic ulcer** (gastric and duodenal ulcers).
According to the graph **gastric ulcer** represents 20% while **duodenal ulcer** 25% (the doctor said 82% but I think she meant 25%).

While **varices** (in patients with liver cirrhosis) and **Mallory Weiss tear** (tear after multiple attacks of forceful vomiting for example in alcoholic patients or hyperemesis gravidarum in pregnant women at the beginning of their pregnancy) are less common.

Other rare causes include:
(Neoplasms, AVM/Ectasia, Dieulafoy's, Stoma ulcers, esophageal ulcers, Deodenitis, Hemobilia, Aorto-enteric fistulas) the doctor just mentioned the following
Neoplasms: gastric, esophageal
Hemobilia: bleeding from biliary tree
Aorto-enteric fistula: fistula between colon and aorta (massive arterial bleeding from aorta).

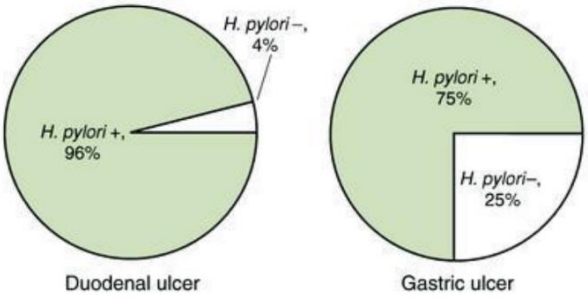
Peptic ulcer disease

- Defect in the GI mucosa extending through the muscularis mucosa.
- Decreasing incidence.
- Caused by imbalance between the aggressive and defensive factors.

Its two main causes are **H.pylori** and **NSAIDs** (even one pill can cause peptic ulcer especially in diabetic or elderly patients so you have to be very cautious when you prescribe NSAIDs to them).

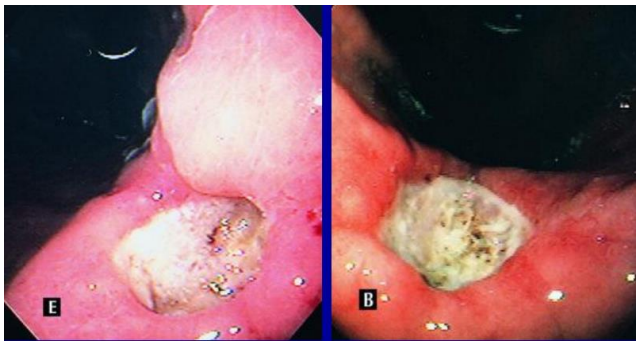
- Acid Hypersecretory state.
- Antral G cell Hyperplasia.

H.pylori is associated with 96% of duodenal ulcers and 75% of gastric ulcers (the other 25% of gastric ulcer could be associated with NSAIDs or malignancy).
Note: there is a rule in endoscopy that you have to biopsy any gastric lesion.

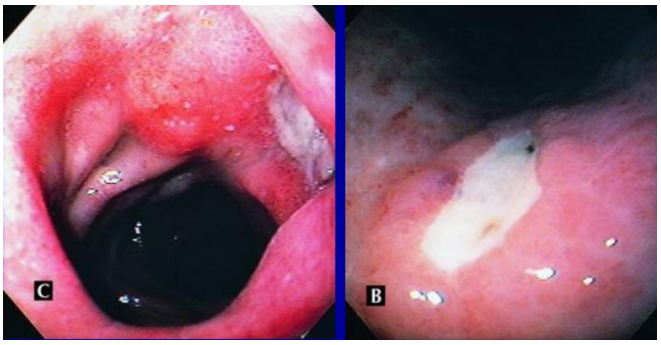


And now look for some endoscopic pictures:

Gastric ulcer

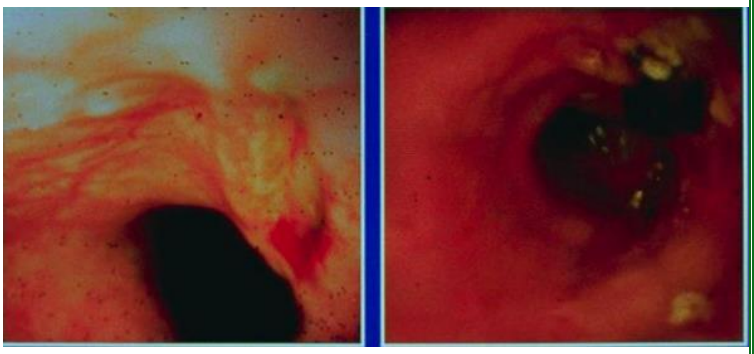


Duodenal ulcers

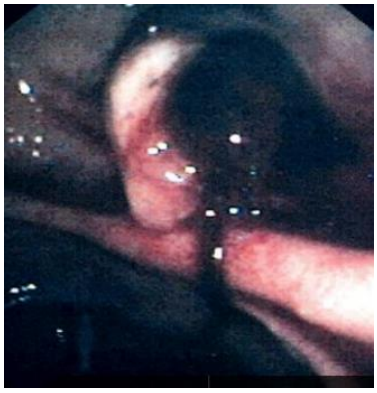


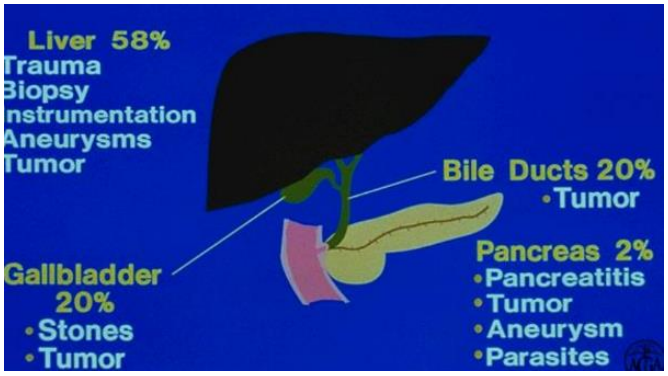
Mallory -weiss

- Laceration around the GE junction.
- Classical presentation as bleeding. after episode of vomiting
- Classical presentation found in 50% only
- its self-limiting (we can give PPI).



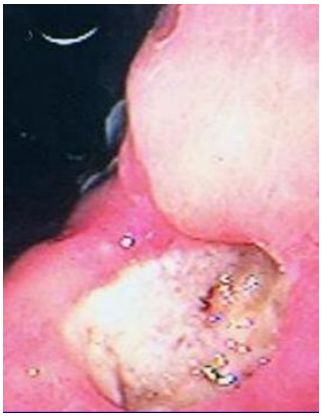
Hemobilia





Hemobilia is blood coming out of ampulla of vater because of stone, tumor, ERCP… Look at the picture at left the black color is blood coming out of ampulla of vater.

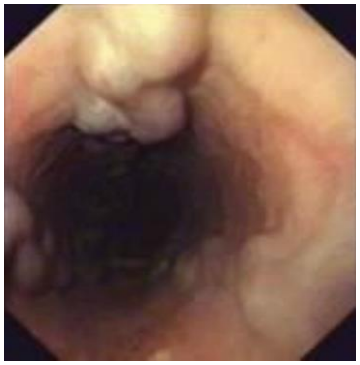
Stress ulcers



When we say stress ulcer we don't mean the stress that you will have at 13/6 (GI final exam) rather we mean something really serious (extensive burn **Curling** or head injury **Cushing** or ICU patient) curling and cushing ulcers are similar to each other with same treatment (to deal with the underlying cause with PPI)

- Caused by Vagal hyperstimulation and vascular hypoperfusion.
- Body and fundus more affected (unlike ulcers caused by H.pylori and NSAIDs that are mainly in the antrum)
- Multiple
- Prophylaxis is indicated in critically ill ICU patients

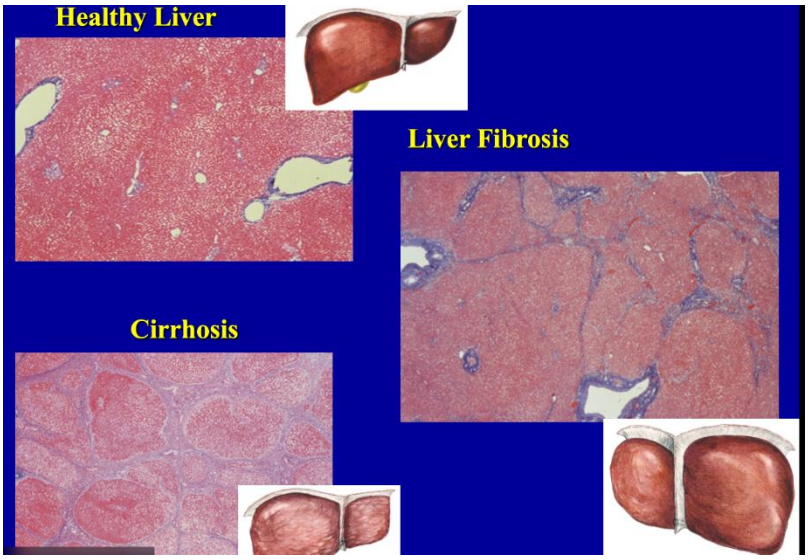
BLEEDING ESOPHAGEAL VARICEAL



- Dilated tortuous veins of the lower and mid esophagus.
- Secondary to portal HTN
- 30% mortality after the first episode.
- 60% Rebleeding rate

Varices is caused by portal hypertension, and one of the most common causes of varices is alcohol.
In Jordan the most common cause of liver cirrhosis is NASH nonalcoholic steatohepatitis
In **NASH** (the patient is nonalcoholic but has fat deposition in the liver as result of morbid obesity, poorly controlled diabetes and hypertriglyceridemia for example).

Now we are done with upper GI bleeding let's talk about **cirrhosis and portal hypertension**

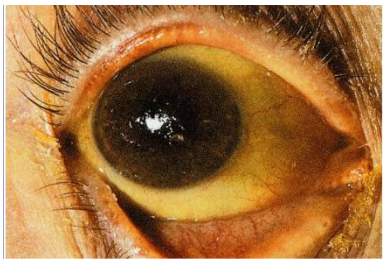


Liver cirrhosis (scaring of the liver) is irreversible stage, but if we catch it at early stage such as patient with NASH (with weight loss and control of diabetes fibrosis could be reversed or stopped at least), and as we mentioned earlier liver cirrhosis is the main cause of portal hypertension.
Look at the picture of liver cirrhosis above, notice how the liver is nodular.

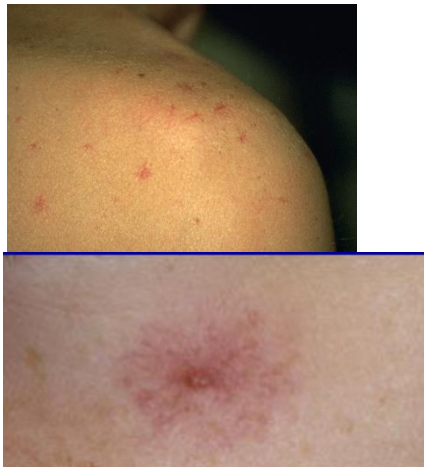
Stigmata or clinical features of chronic liver disease

The doctor said that we will be asked about it in the clinical years so memorize the well

1) **Jaundice :** yellowish discoloration of sclera mucus membranes
   Accumulation of bilirubin in the blood stream causing yellowish discoloration of plasma and heavily perfused tissues



2) **Spider angioma:** Small, centrally raised bumps (papules) caused by a dilated arteriole (small artery). A network of dilated capillaries (tiny blood vessels) radiate from the arteriole. Pressing on the lesion causes the redness to disappear briefly, and there is a rapid return of redness once the pressure is lifted.



Dilatation of capillaries because of hyperestrogenemia in patients with liver cirrhosis

From google(t is thought that damage to the liver impairs its capacity to metabolize and inactivate estrogens).

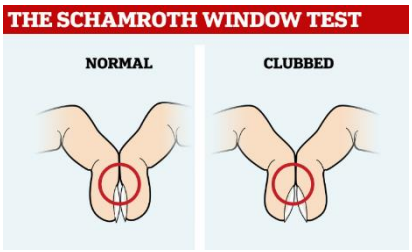
They are considered normal if present on the chest of pregnant woman. From google, 2/3 of pregnant women can have spider angioma without liver disease.

3) **Finger clubbing:** a condition where there is enlargement of the terminal end of the digit over the distal phalanx. It is usually symmetrical and affects the fingers.

The doctor mentioned shamroth window and here is clarification from google:

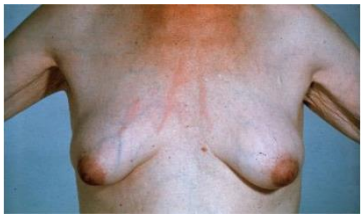
Schamroth window: the diamond-shaped gap formed when two opposing fingers are placed back to back

Schamroth sign: occurs in finger clubbing, when this window is obliterated and the distal angle formed by the two nails becomes wider



Finger clubbing could be associated with liver cirrhosis, lung cancer, inflammatory bowel disease or it could be familiar.

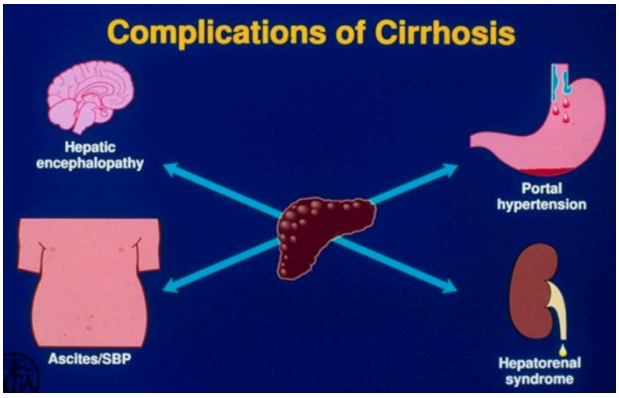
4) Gynecomastia: breast development in men and breast atrophy in females



5) Dupuytren's Contractures: Joint contractures

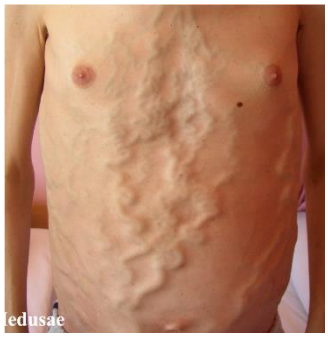
Could also be associated with diabetes

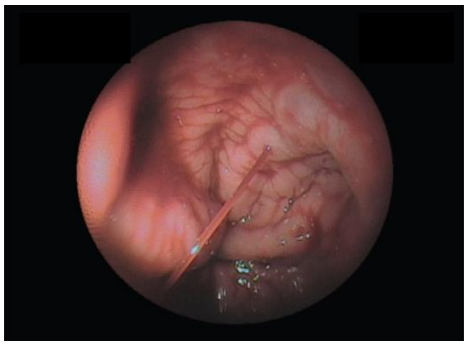
Complications of cirrhosis

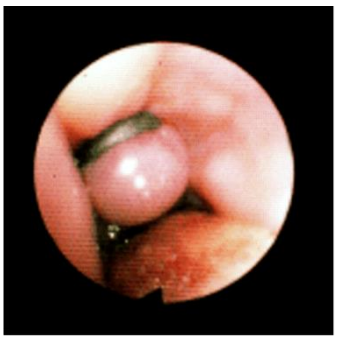


1) variceal bleeding
2) Hepatic encephalopathy (as we know the function of the liver is detoxification so when there is abnormality in its function toxins such as ammonia and nitrous oxide will accumulate -these toxins build up in the body and travel to the- brain causing decreasing level of consciousness and hepatic encephalopathy)
3) Ascites: abdominal distension due to fluid accumulation one of its complication is **SBP** Spontaneous bacterial peritonitis (translocation of colonic bacteria to peritoneum).
4) hepatorenal syndrome : renal impairment in patients with liver disease
5) Portal hypertension

Caput Medusae: Distended and engorged umbilical veins which are seen radiating from the umbilicus across the abdomen to join systemic veins.
Dilatation of superficial abdominal veins.
It's a manifestation in patients with liver cirrhosis



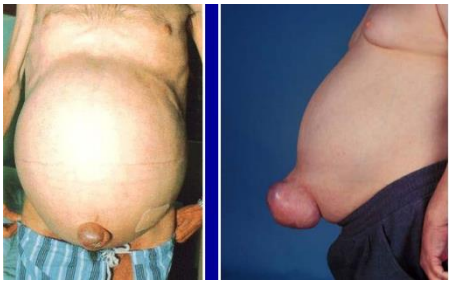




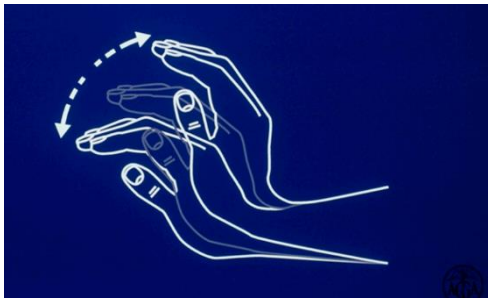
The picture on the left shows Spurting vessel from a varix (شلال دم)

While on the right shows band ligation to prevent recurrence of bleeding

- This patient has ascites and paraumbulical hernia

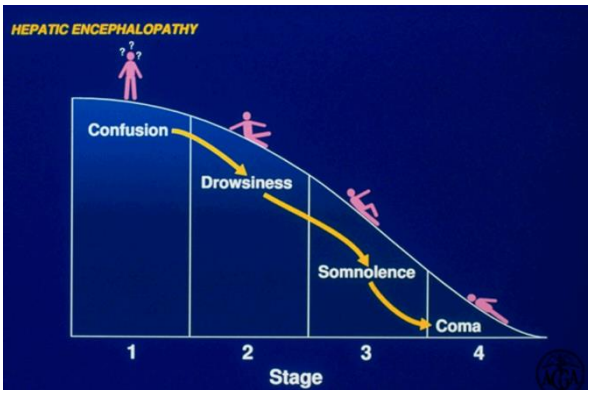


ASTRAXIA



- Flapping tremors, quick arrhythmic movement in background tonic muscle contraction
  ايد المريض بتصير ترجف وتروح وتيجي لقدام زي الصورة
  It could be seen in patients with liver cirrhosis

If patients with liver cirrhosis develop encephalopathy it will develop in stages Starting with **confusion** and **reversal of the sleep/wake cycle** then **drowsiness** and **somnolence** and at stage 4 complete **coma**

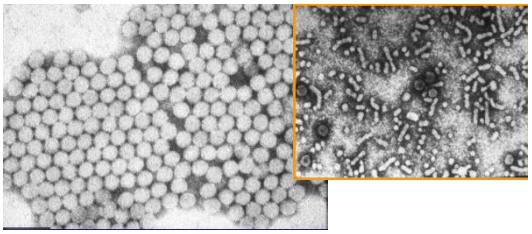


Finally the last topic (**Hepatitis A-E viruses**)

	A	B	C	D	E
Source of virus	feces	blood/ blood-derived body fluids	blood/ blood-derived body fluids	blood/ blood-derived body fluids	feces
Route of transmission	fecal-oral	percutaneous permucosal	percutaneous permucosal	percutaneous permucosal	fecal-oral
Chronic infection	no	yes	yes	yes	no
Prevention	pre/post-exposure immunization	pre/post-exposure immunization	blood donor screening; risk behavior modification	pre/post-exposure immunization; risk behavior modification	ensure safe drinking water

Modes of transmission:
Hepatitis A+E: feco-oral
Hepatitis B+C+D: blood borne (blood transfusion, sexual transmission or vertical)
Chronicity:
B+C cause chronic infection and as we know hepatitis D can't cause infection by itself it either co-infects with hepatitis B (both B+D infect together) or superinfection (meaning that the patient already has hepatitis B and then infected with D).
A+E: cause acute infection
Vaccine:
We have vaccines to protect against **A+B**
Every child in Jordan gets vaccinated against **hepatitis B**, while **hepatitis A** vaccine is given selectively if the patient has chronic liver disease and we are afraid of fatal acute hepatitis A infection.
Hepatitis C (which is RNA virus) has no vaccine but has very effective treatment with eradication percent reaching 99%.

Let's start talking about **hepatitis A:**

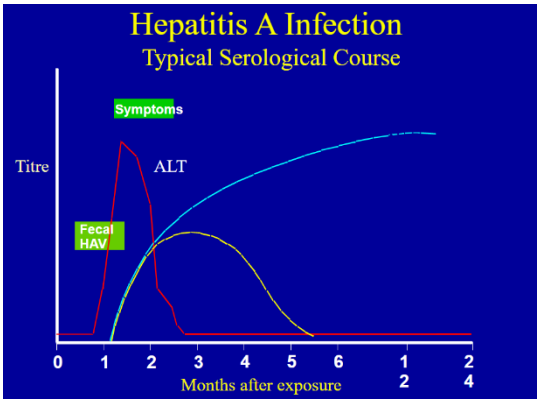


As we said it's transmitted **feco-orally**. The possibility of developing symptoms is directly proportional with the age (less than 10% of infected children under 6 years will show symptoms such as jaundice ,and they will develop anti-hepatitis A antibodies) older patients will have more symptoms .
Fulminant hepatitis means severe acute hepatitis.

▪ Incubation period:	Average 30 days Range 15-50 days
▪ Jaundice by age group:	<6 yrs, <10% 6-14 yrs, 40%-50% >14 yrs, 70%-80%
▪ Complications:	Fulminant hepatitis Cholestatic hepatitis Relapsing hepatitis
▪ Chronic sequelae:	None

Hepatitis A is diagnosed by (anti-hepatitis A **igM**)
Notice that the viral shedding (fecal HAV) is higher before the appearance of symptoms while it declines after the appearance of them (the patient is no longer contagious).

In endemic areas, children get infected and generate antibodies.



Hepatitis A Virus Transmission:

- **Close personal contact**
  (e.g., household contact, sex contact, child day care centers)
- **Contaminated food, water** (e.g., infected food handlers, raw shellfish)
- **Blood exposure (rare)** (e.g., injecting drug use, transfusion)

Laboratory diagnosis:

- Acute infection is diagnosed by the detection of HAV-IgM in serum by EIA.
- Past Infection i.e. immunity is determined by the detection of HAV-IgG by EIA.

Hepatitis B

Blood borne transmission.

- If the person infected with hepatitis B is under 5 years: no clinical features (no jaundice).
- If there is a pregnant women which has hepatitis B, during delivery she will transmit the virus to her baby (the baby will have no symptoms but unfortunately in 95% of cases he will be a chronic carrier of hepatitis B).

Incubation period:	Average 60-90 days Range 45-180 days
Clinical illness (jaundice):	<5 yrs, <10% 5 yrs, 30%-50%
Acute case-fatality rate:	0.5%-1%
Chronic infection:	<5 yrs, 30%-90% 5 yrs, 2%-10%
Premature mortality from chronic liver disease:	15%-25%

It's thought that shortly after birth the immune system won't be mature yet so the child will stay in the **immune toleran**t phase (meaning that he has the virus but the immune system can't recognize it) so the child develops no symptoms (as symptoms develop because of the fight between the virus and immune system and here we have no fight because we can't recognize the virus)

At certain point of his life the immune system will recognize the virus as foreign (**immune active phase**) at this phase the patient will show symptoms such as jaundice

- As in hepatitis A adults will show more symptoms (as they have mature immune system that will recognize the virus) at the end their immune system will beat the virus so they recover

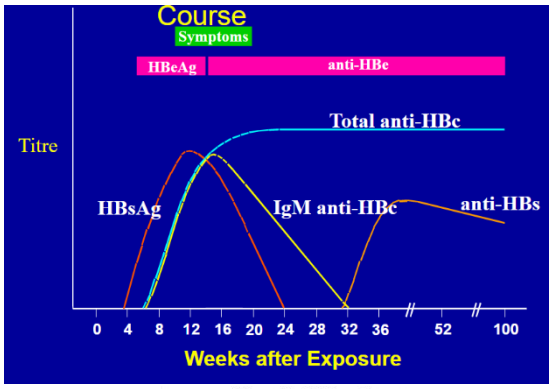
Spectrum of Chronic Hepatitis B Diseases

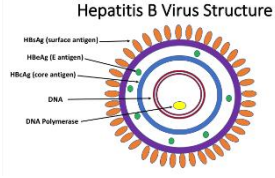
1. Chronic Persistent Hepatitis - **asymptomatic**
2. Chronic Active Hepatitis - **symptomatic** exacerbations of hepatitis
3. **Cirrhosis** of Liver
4. Hepatocellular **Carcinoma**

Course of acute hepatitis B infection with recovery

So mainly the patient is an adult **(**don't be confused , in the table above its mentioned that hepatitis B causes chronic infection but as you will see in the next page adults usually recover with no chronicity**)**

Look at the graph we have:

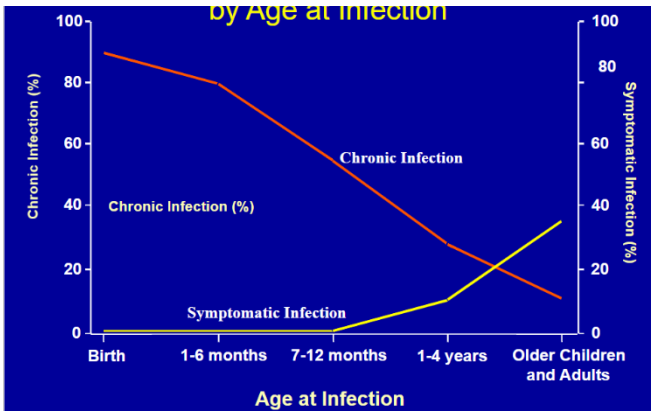




HBsAg: (Hepatitis B surface antigen) is the first one to appear .
Anti-HBs: Hepatitis B surface antibody.
Note in the **window period** were the HBsAg has disappeared and the anti-HBs has not appear yet we have **IgM anti-HBc**: Hepatitis B core antibody.
To diagnose a patient with abnormal liver function test or jaundice we ask for HBsAg as well as IgM anti-HBc (to diagnose the patient even if he is in the window period).

Outcome of Hepatitis B Virus Infection by Age at Infection

The yellow line indicates symptomatic infection: at young age (almost no symptoms) as the age increase the possibility to develop symptoms increases
While the red line indicates chronicity: the young child is more likely to have chronic infection (up to 95%) as we said he has immature immunity
So the **child** will have asymptomatic chronic infection
While the **adult** will have symptomatic but not chronic infection



Hepatitis B Virus Modes of Transmission

- Sexual - sex workers and homosexuals are particular at risk.
- Parenteral - IVDA, Health Workers are at increased risk.
- Perinatal - Mothers who are HBeAg positive are much more likely to transmit to their offspring than those who are not. Perinatal transmission is the main means of transmission in high prevalence populations.

Concentration of Hepatitis B Virus in Various Body Fluids

High	Moderate	Low/Not Detectable
blood	semen	urine
serum	vaginal fluid	feces
wound exudates	saliva	sweat
		tears
		breastmilk

Diagnosis:

- A battery of serological tests are used for the diagnosis of acute and chronic hepatitis B infection.
- HBsAg - used as a general marker of infection.(we usually use it to diagnose acute hepatitis B)

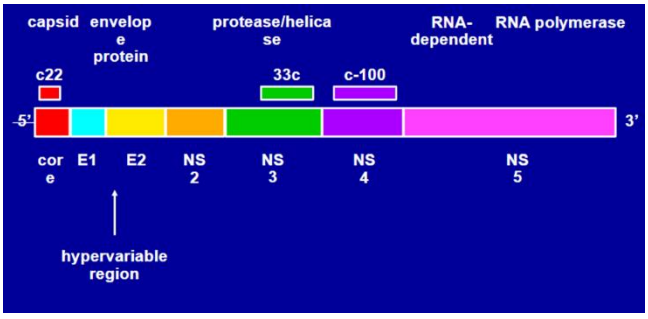
- HBsAb - used to document recovery and/or immunity to HBV infection.(Indicates immunity or prior infection)
- Anti-HBc IgM - marker of acute infection.(to diagnose acute infection at the window period)
- Anti-HBc-IgG past or chronic infection.
- HBeAg - indicates active replication of virus and therefore infectiveness.
- Anti-Hbe - virus no longer replicating. However, the patient can still be positive for HBsAg which is made by integrated HBV.
- HBV-DNA - indicates active replication of virus, more accurate than HBeAg especially in cases of escape mutants. Used mainly for monitoring response to therapy.

Prevention

- **Vaccination** - highly effective recombinant vaccines are now available. Vaccine can be given to those who are at increased risk of HBV infection such as health care workers. It is also given routinely to neonates as universal vaccination in many countries.(the doctor mentioned that the antibody titer should be above 10 to be protective ,check your antibody titer) Antibody titer is a laboratory test that measures the level of antibodies in a blood sample
- **Hepatitis B Immunoglobulin** - HBIG may be used to protect persons who are exposed to hepatitis B. It is particular efficacious within 48 hours of the incident. **It may also be given to neonates who are at increased risk of contracting hepatitis B i.e. whose mothers are HBsAg and HBe Ag positive**. A neonate for Hepatitis B infected mom should be given vaccine in one arm and immunoglobulin in the other
- Other measures - screening of blood donors, blood and body fluid precautions.

Hepatitis C virus (الدكتورة كملت الباقي ب 5 دقايق ازا مش اقل)

Incubation period:	Average 6-7 wks Range 2-26 wks
Clinical illness (jaundice):	30-40% (20-30%)
Chronic hepatitis:	70%
Persistent infection:	85-100%
Immunity:	No protective antibody response identified



It’s RNA virus, up to 70% chronicity, no vaccine but effective antiviral treatment.

Chronic Hepatitis C Infection

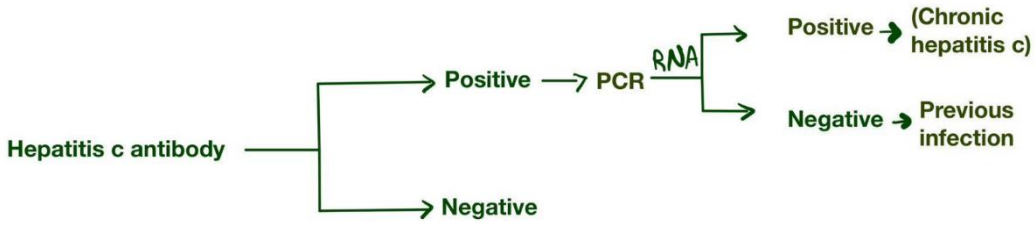
- The spectrum of chronic hepatitis C infection is essentially the same as chronic hepatitis B infection.
- All the manifestations of chronic hepatitis B infection may be seen, albeit with a lower frequency i.e. chronic persistent hepatitis, chronic active hepatitis, cirrhosis, and hepatocellular carcinoma.

Risk factors associated with transmission of HCV

- Transfusion or transplant from infected donor
- Injecting drug use
- Hemodialysis (yrs on treatment)
- Accidental injuries with needles/sharps
- Sexual/household exposure to anti-HCVpositive contact
- Multiple sex partners
- Birth to HCV-infected mother

Laboratory diagnosis

- HCV antibody - generally used to diagnose hepatitis C infection. Not useful in the acute phase as it takes at least 4 weeks after infection before antibody appears.
- HCV-RNA - various techniques are available e.g. PCR and branched DNA. May be used to diagnose HCV infection in the acute phase. However, its main use is in monitoring the response to antiviral therapy.
- HCV-antigen - an EIA for HCV antigen is available. It is used in the same capacity as HCV-RNA tests but is much easier to carry out.

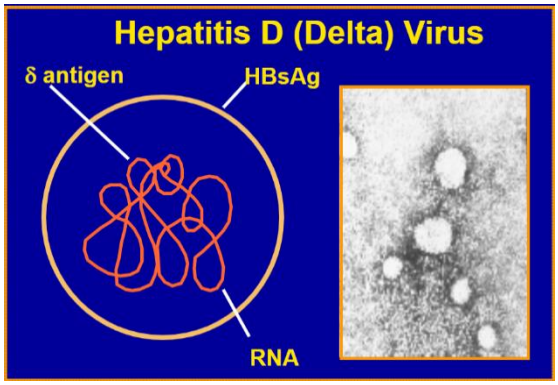


Prevention of HCV

- Screening of blood, organ, tissue donors
- High-risk behavior modification
- Blood and body fluid precautions

Hepatitis D

Clinical features:



Coinfection
– Severe acute disease.
– Low risk of chronic infection.
Superinfection
– Usually develop chronic HDV infection.
– High risk of severe chronic liver disease.
– may present as an acute hepatitis.

Modes of transmission:

- Percutanous exposures
- injecting drug use
- Permucosal exposures
- sex contact

Hepatitis E

Acute, feco-oral transmission (through contaminated water mainly)
Clinical manifistations and fatality increases in pregnant female.

Hepatitis E - Clinical Features	
Incubation period:	Average 40 days Range 15-60 days
Case-fatality rate:	Overall, 1%-3% Pregnant women, 15%-25%
Illness severity:	Increased with age
Chronic sequelae:	None identified

PAST PAPER QUESTIONS

8) A 55 year old man with a history of chronic alcoholism diagnosed with early cirrhosis. The development of which of the following conditions is associated with high mortality rate in this patient?

A) Caput medosa.
B) Ascitis.
C) Hemorrhoids.
D) Splenomegaly.
E) Upper GIT bleeding.

Ans : E

9) All are true regarding hepatitis A virus (HAV) infection, EXCEPT:

A) It is transmitted via feco oral route.

B) HAV vaccine can be given to selected group of patients.

C) Can cause acute liver failure.

D) Usually causes chronic infection.

E) Diagnosis is done by a positive HAV IgM SEROLOGY.

Ans: D

GOOD LUCK

V2

Anything added or modified will be written in red

Page 7 (spider angioma) it should be hyperestrogenemia rather than hypergastrogenemia

Page 8 (caput medosa) It’s a manifestation in patients with liver cirrhosis (added note)