

Viral hepatitis and alcoholic liver disease

Dr. eman Krieshan, m.d.

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hepatitis

- Hepatitis is applied to patterns of acute and chronic hepatic injuries that are produced by:

specific only for liver ➤ **Hepatotropic viruses** (have a specific affinity for the liver).

➤ **Other viruses** such as EBV, CMV .
عنى غير كبد .

➤ **Yellow fever**

➤ **Autoimmune reactions.**

➤ **Drugs and toxins.**

paracetamol
أكثر دوا بأثره كبدى
hepatic injury

Case study

- A 27-year-old man develops malaise, fatigue, and loss of appetite ^{Acute not chronic} **three weeks** after **a meal** at café. He notes passing ^{↑ bilirubin} **dark urine**. On physical examination, he has mild **scleral icterus** and ^{gall bladder} **right upper quadrant** tenderness. Laboratory studies show serum AST of 62 U/L and ALT of 58 U/L. The total bilirubin concentration is 3.9 mg/dL, and the direct bilirubin concentration is 2.8 mg/dL. His ^{اختفت} **symptoms abate** over the **next 3 weeks**.

LFT	Normal range
Protein	6.6-8.3 g/dL
Albumin	3.5-5.2 g/dL
Total bilirubin	0.2-1.3 mg/dL
ALT	<40 U/L
AST	<40 U/L

Diagnosis

- Clinical history and examination.
- Laboratory testing.
Liver enzyme increased
- Biopsy.

Signs and symptoms

اعراض عدوى التهاب
الكبد
hepatitis
فانكرضت بيجيني

- infection with hepatitis viruses produces a wide range of outcomes including:

❖ Acute Asymptomatic Infection:

- elevated serum transaminases or the presence of anti-viral antibodies, HAV and HBV infections, particularly in childhood.

❖ Acute Symptomatic Infection, consisting of:

- (1) an ^{حضانة} incubation period of variable length.
- (2) a ^{مرحلة ما قبل صفار Jaundice} symptomatic preicteric phase.
- (3) a ^{اخرى Jaundic} symptomatic icteric phase.
- (4) ^{اختفاء المرض} convalescence.

3) ❖ Fulminant Hepatic Failure:

→ necrosis cell parenchyma
→ Acute or chronic

- Occur with HBV and HAV.

4) ❖ Chronic Hepatitis:

التهاب الكبد المزمن
يعتبر الكبد مريضاً
6 أشهر

- persistent or relapsing hepatic disease for a period of more than 6 months.
- Possible symptoms:
- elevations of serum transaminases. *not specific for chronic*
- fatigue, malaise, loss of appetite, and bouts of mild jaundice. *general symptoms not specific*

❖ The Carrier State:

مرضى حامل الفيروس
عنهم أعراض ولا يعانون
طال المرض

- A carrier is an individual who is chronically infected with a hepatropic virus and has no or subclinical evidence of liver disease.

Associated signs and symptoms include:

Signs
Exam

• لو شفت همدول اليرقان
ما بقدر أحكم

- **General**: fatigue (most common), malaise, mild discomfort in the right upper quadrant, anorexia

• همدول اليرقان
العام

- Impaired biliary tract function: jaundice, pruritus

- Portal hypertension: gastroesophageal varices, ascites, edema, splenomegaly

- Impaired hepatocyte metabolism: spider angiomas, hepatic encephalopathy, easy bleeding / bruising

• دلالة قاطعة
أنه أمراض كبد

Liver Disease

Laboratory findings

- Aminotransferase levels . *AST → increase in Liver Dts.
ALT*
- Serological testing for hepatitis B, C and D and autoantibodies

injury in liver happen in {
→ hepatocyte → *hepatic enzyme [AST/ALT]*
→ portal tract → *Biliary enzyme*
→ central vein →

1:1 AB → *SP 90*
liver *in SP* → *90%*
Disease

نادر (rare) - أكثر (more common) - يتحول (becomes) chronic

Virus	Hepatitis A (HAV)	Hepatitis B (HBV)	Hepatitis C (HCV)	Hepatitis D (HDV)	Hepatitis E (HEV)
Viral genome	ssRNA	partially dsDNA	ssRNA	Circular defective ssRNA	ssRNA
Viral family	Hepadnavirus	Hepatovirus; related to picornavirus	Flaviviridae	Subviral particle in Delta virus family	Calicivirus or geminivirus or reovirus
Route of transmission	Fecal-oral (contaminated food or water)	Parenteral, sexual contact, perinatal	Parenteral; intranasal cocaine use is a risk factor	Parenteral	Fecal-oral
Incubation period	2-6 weeks	2-26 weeks (mean 8 weeks)	4-26 weeks (mean 9 weeks)	Same as HBV	4-5 weeks
Frequency of chronic liver disease	Never	5-10%	>80% - highly convert into chronic → liver cirrhosis	10% (coinfection); 90-100% for superinfection	In immunocompromised hosts only
Diagnosis	Detection of serum IgM antibodies	Detection of HBsAg or antibody to HBcAg; PCR for HBV DNA	ELISA for antibody detection; PCR for HCV RNA	Detection of IgM and IgG antibodies, HDV RNA in serum, or HDAg in liver biopsy	Detection of serum IgM and IgG antibodies; PCR for HEV RNA

A, E

زى بعض في كل شىء
 ① 1 month
 ② RNA
 ③ feco oral
 ④ Acute not chronic
 ⑤ IgM

B, C, D

زى بعض في
 ① طريقة انتقال
 ② Incubation period
 ↳ 4-5 months

virus → cancer

أكثر مع B
 أقل مع C

تخيل HDV مثل لص صغير ما عنده مفتاح للباب، يستنى HBV يعطيه المفتاح (HBsAg).

3. أنواع العدوى بفيروس D

A. Coinfection - مزدوجة - عدوى

- المريض يُصاب بـ HBV و HDV معاً في نفس الوقت.
- غالباً ما تكون عدوى حادة فقط وتنتهي.
- ممكن تسبب التهاب كبد حاد، لكن نادراً ما تتحول لمرمئة.

B. Superinfection - عدوى فوق مزمئة - عدوى

- الشخص عنده HBV مزمن، ويعيد ينعدي بـ HDV.
- هادي أخطر حالة!
- لينش؟ لأن الكبد أصلاً مريض بـ B، ولما يدخل D عليه، يصير تدهور سريع في الكبد.
- ممكن تسبب:
- تلف كبدى سريع (rapid cirrhosis)
- فشل كبدى حاد (fulminant hepatic failure)

← تفهم بسيط لهادي الجزئية

1. Hepatitis A Virus (HAV).



- HAV usually is a benign self-limited infection that does not cause chronic hepatitis and rarely produces fulminant hepatitis.
- incubation period of 3-6 weeks, shed in the stool for 2 to 3 weeks before and 1 week after the onset of jaundice.
- The infection associated with poor hygiene and sanitation, ingestion of steamed shellfish.
- Acute HAV tends to cause a febrile illness, jaundice and nonspecific symptoms such as fatigue and loss of appetite.

fecal-oral

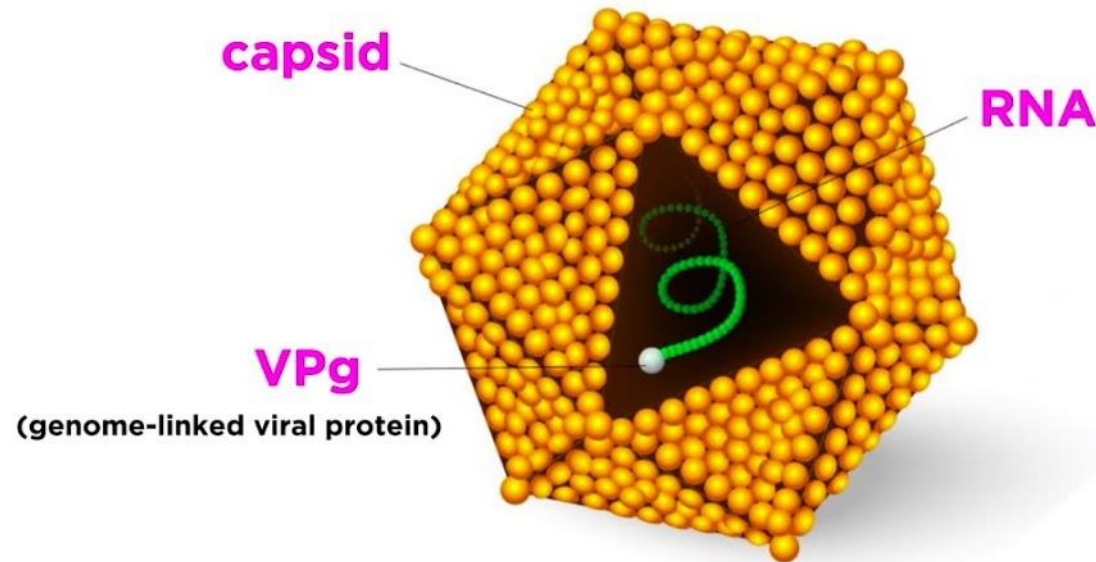
not specific for HAV
but
Liver Dts بنفشه ایونی

gno. ←

- HAV is a small, nonenveloped, positive-strand RNA picornavirus
- The cellular immune response, particularly that involving cytotoxic CD8+ T cells, plays a key role in HAV-mediated hepatocellular injury.

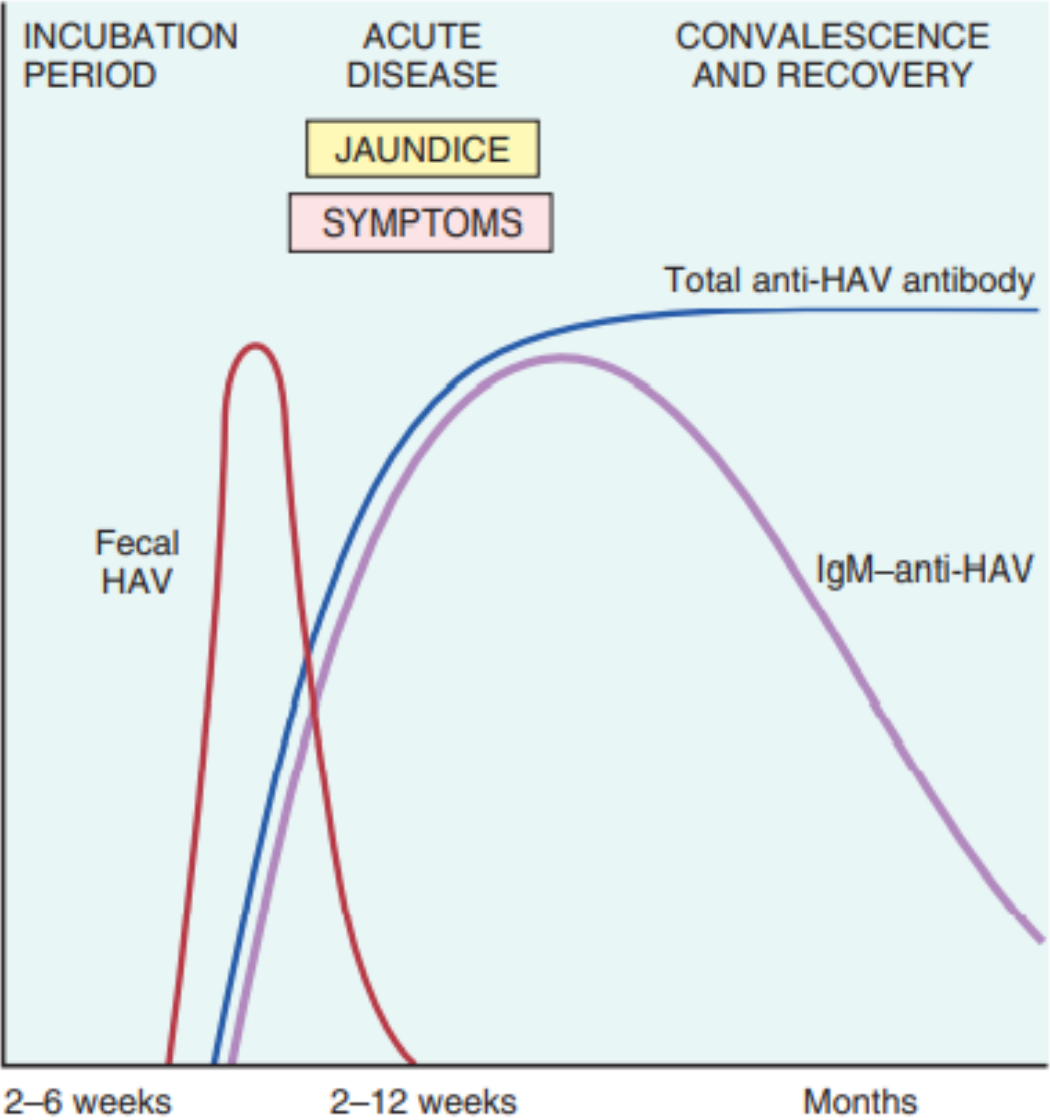
Hepatitis A

caused by a **picornavirus**



- IgM antibody against HAV appears in blood at the onset of symptoms and is a reliable marker of acute infection

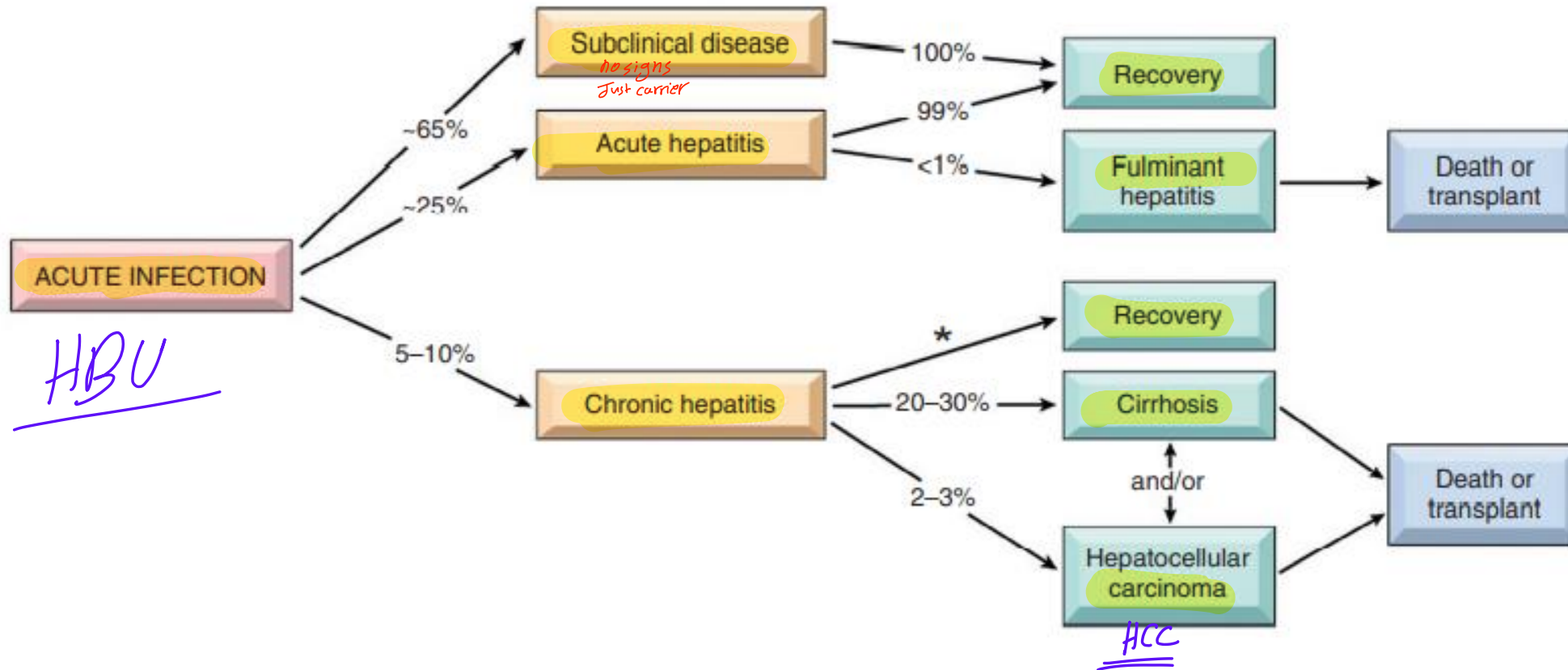
The IgM response usually declines in a few months followed by the appearance of IgG anti-HAV that persists for years, often conferring lifelong immunity.



2. Hepatitis B Virus (HBV).

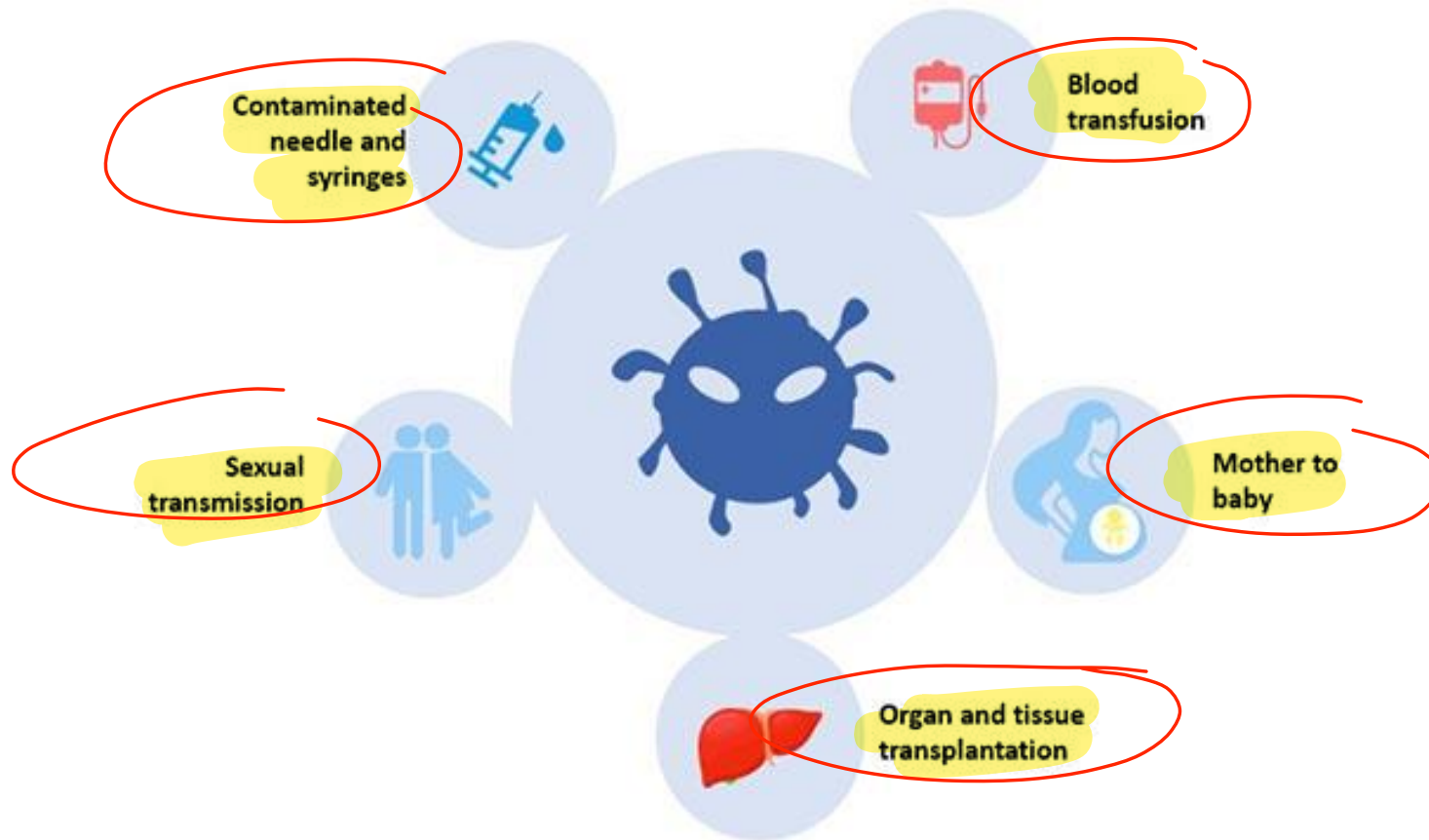
- The outcome of HBV infection varies widely, from:
- (1) acute hepatitis with recovery and clearance of the virus.
- (2) nonprogressive chronic hepatitis. *يعني صير مزمن بس ما صار شيع دة حاسر*
- (3) progressive chronic disease ending in cirrhosis. *or cancer*
- (4) fulminant hepatitis with massive liver necrosis.
- (5) an asymptomatic "healthy" carrier state.





transmission of HBV.

- 1 دم
- 2 جنسی
- 3 ام ← طفل
- 4 نقل اعضاء
- 5 و.ا.

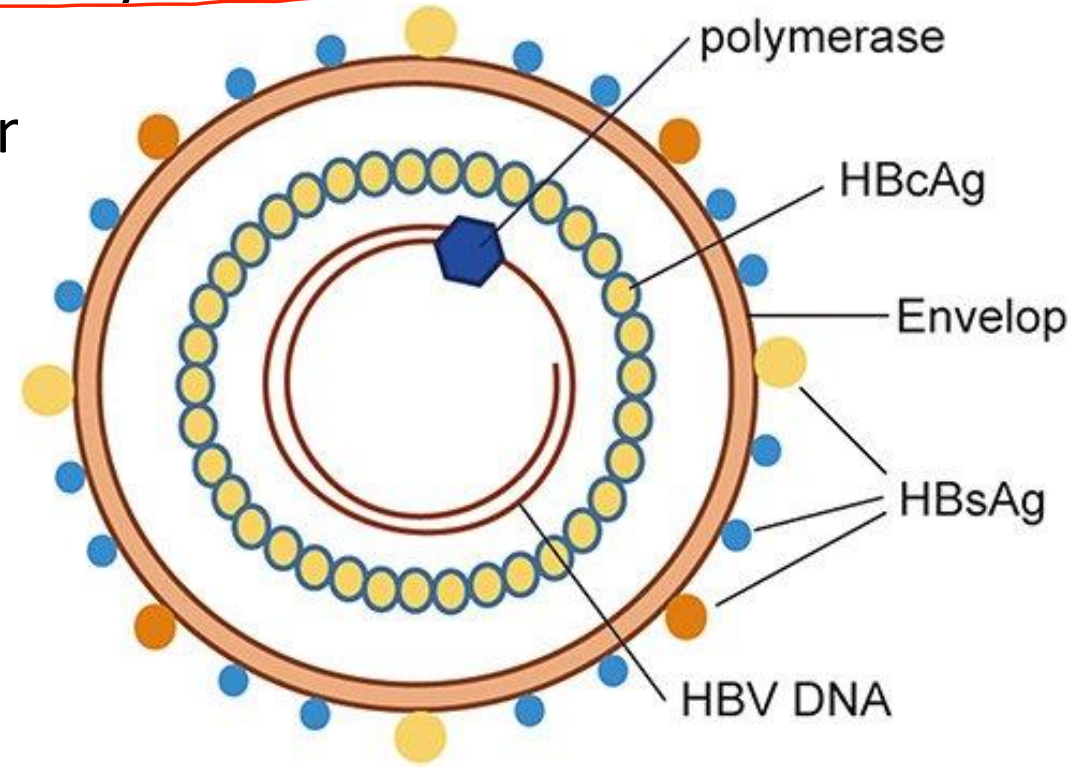


مش عارفه اذا داخل
لوحة

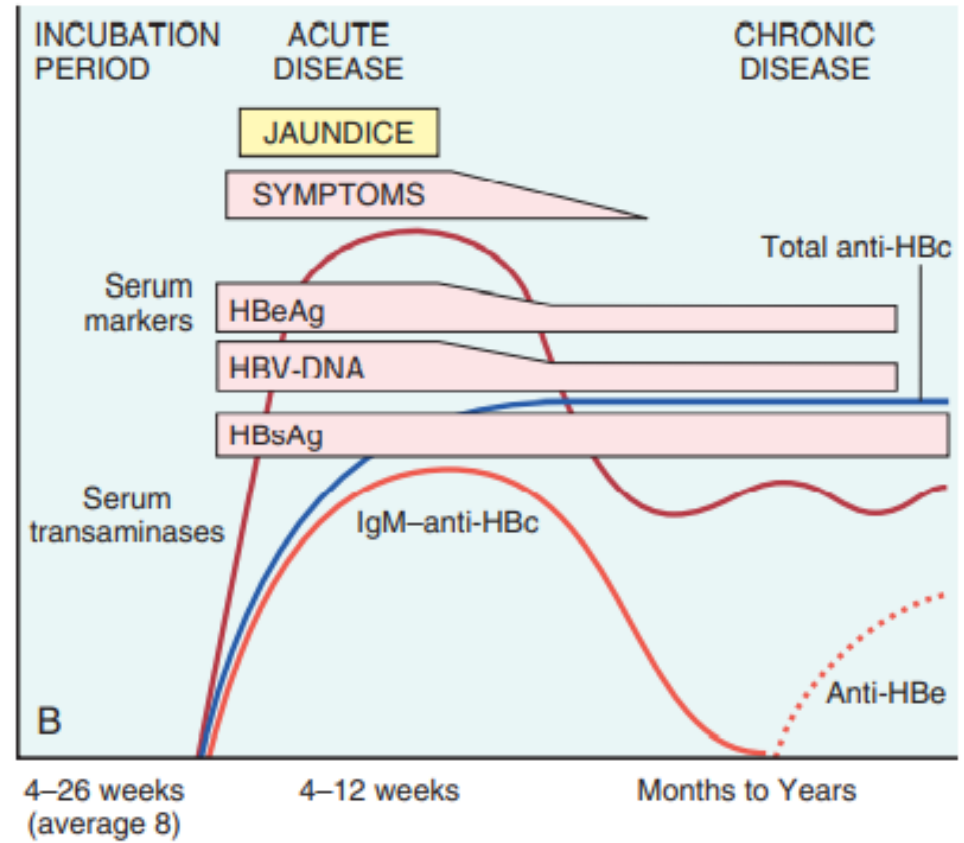
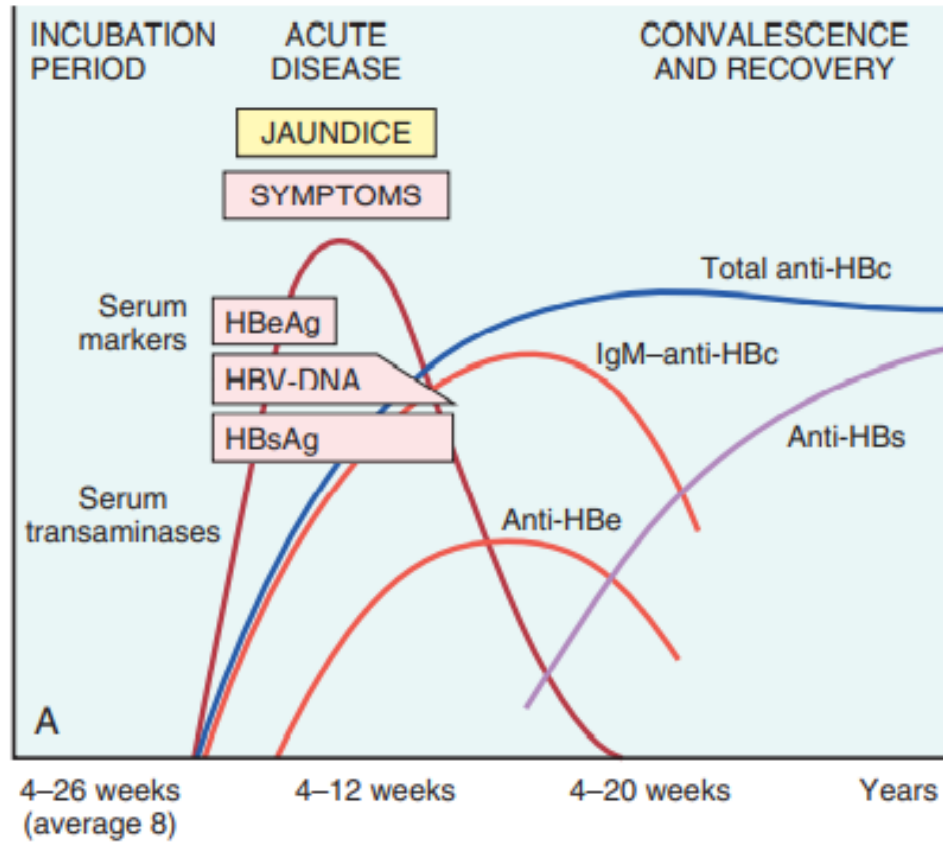
- HBV is a member of Hepadnaviridae, a family of DNA viruses.
- The HBV genome is a partially double-stranded, which encode the following proteins:
 - ✓ Nucleocapsid “core” protein (HBcAg).
 - ✓ Envelope glycoproteins (HBsAg).
 - ✓ A polymerase (Pol) with both DNA polymerase activity and reverse transcriptase activity.
 - ✓ HBx protein, which is required for virus replication

HBsAg : مصاب بكون

HBsAb : بسا يتحافى بكونه
surface



The course of the disease

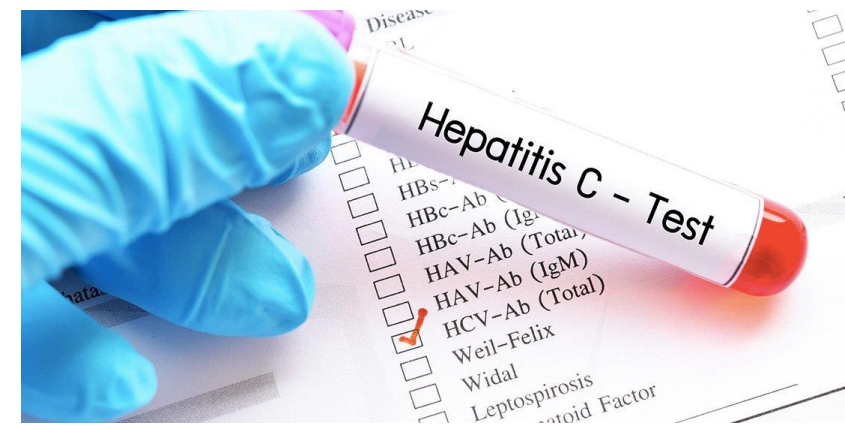


العمر مهم في
HBV

- HBV generally is not directly hepatotoxic, and most hepatocyte injury is caused by CD8+ cytotoxic T cells attacking infected cells.
- Patient age at the time of infection is the best predictor of chronicity. In general, the younger the age at the time of HBV infection, the higher the chance of chronic infection.
- Treatment of chronic hepatitis B with viral polymerase inhibitors and interferon can slow disease progression.

على ما علمنا، المرض في العمر على ما نلاحظ
سواء تحول للمزمن أو تشعير وسرطان

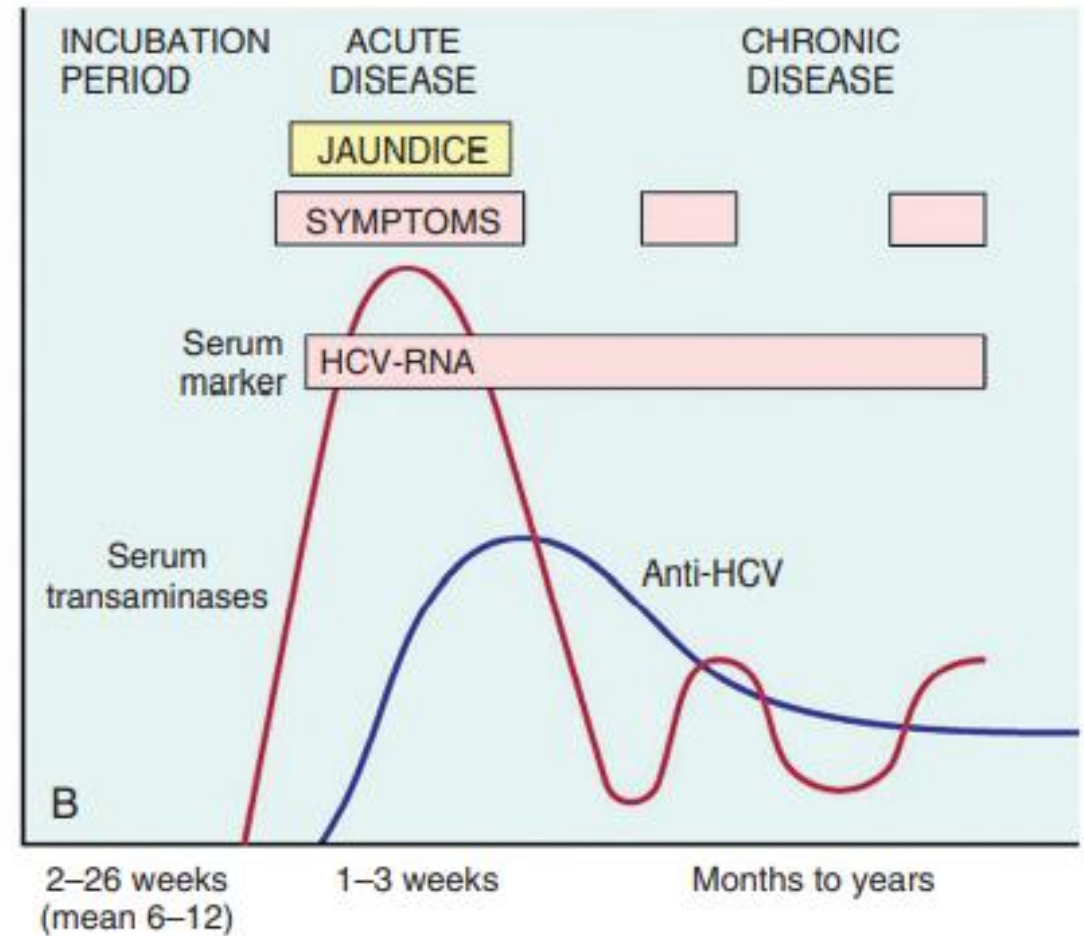
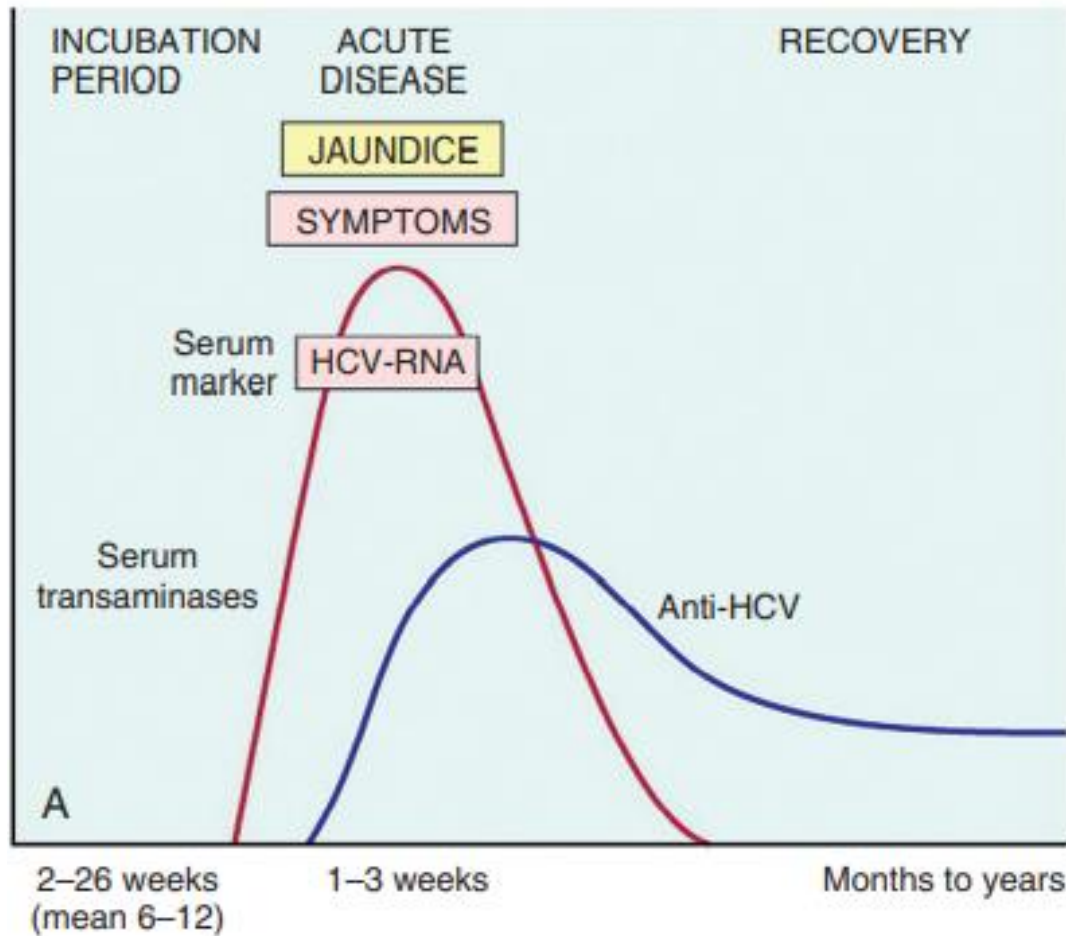
3. Hepatitis C Virus (HCV). Igu



- According to data from the Centers for Disease Control and Prevention (CDC), the most common risk factors for HCV infection are as follows:
- Intravenous drug abuse
- Multiple sex partners
- Having had surgery within the last 6 months
- Needle stick injury
- Multiple contacts with an HCV-infected individual
- Employment in the medical or dental field.
- perinatal transmission from the mother.

Igu

- HCV is a small, enveloped, single-stranded RNA virus, member of the Flaviviridae family.



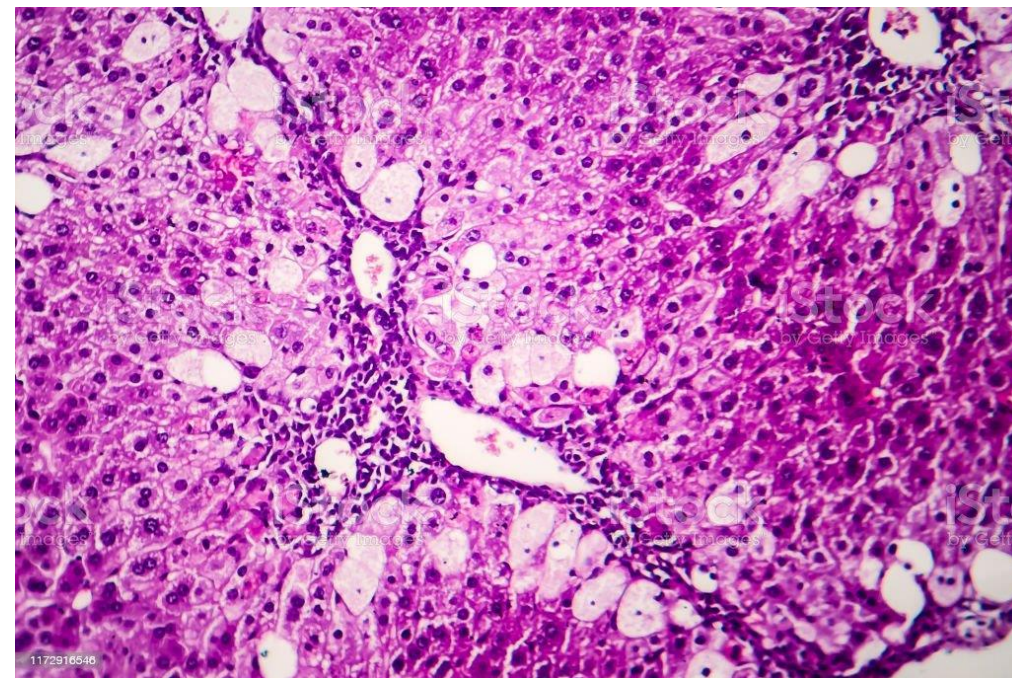
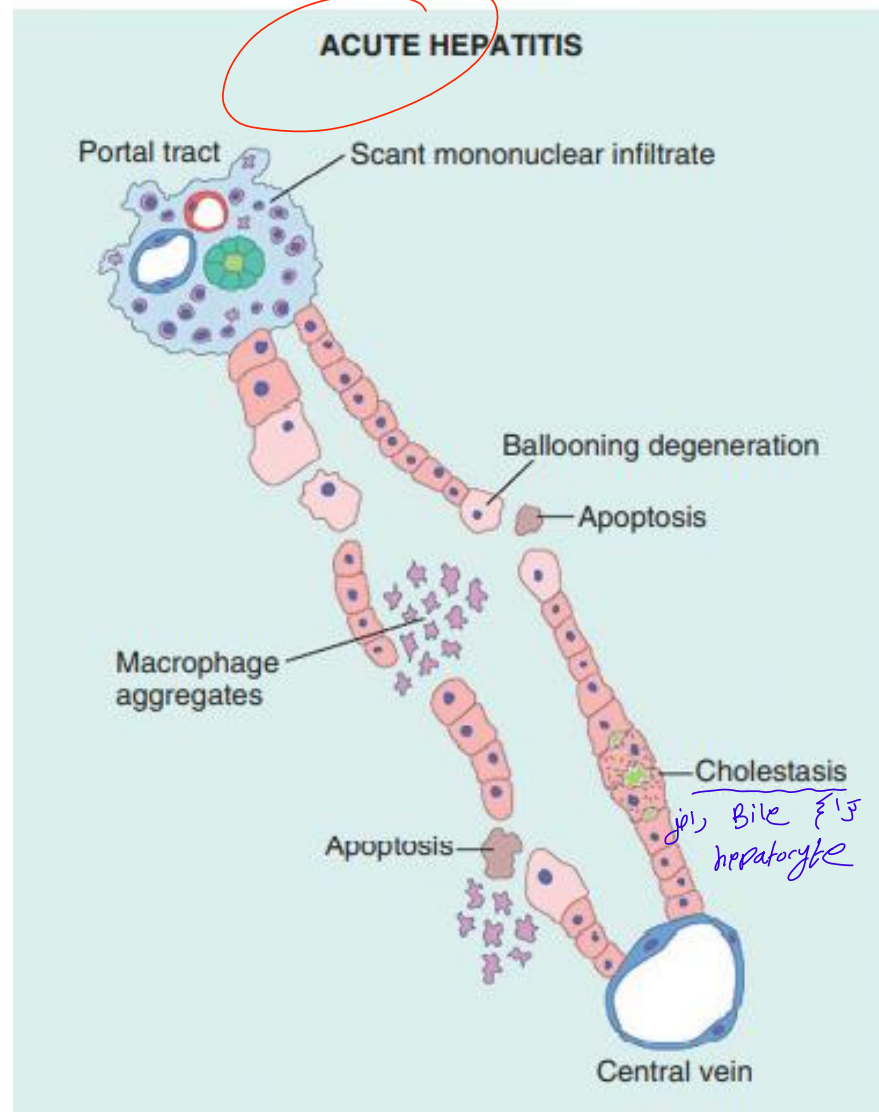
4. Hepatitis D Virus (HDV).

- HDV is a unique RNA virus that is dependent for its life cycle on HBV. Infection with HDV arises in the following settings:
- Coinfection by HDV and HBV.
- Superinfection of a chronic HBV carrier by HDV.

5. Hepatitis E Virus (HEV).

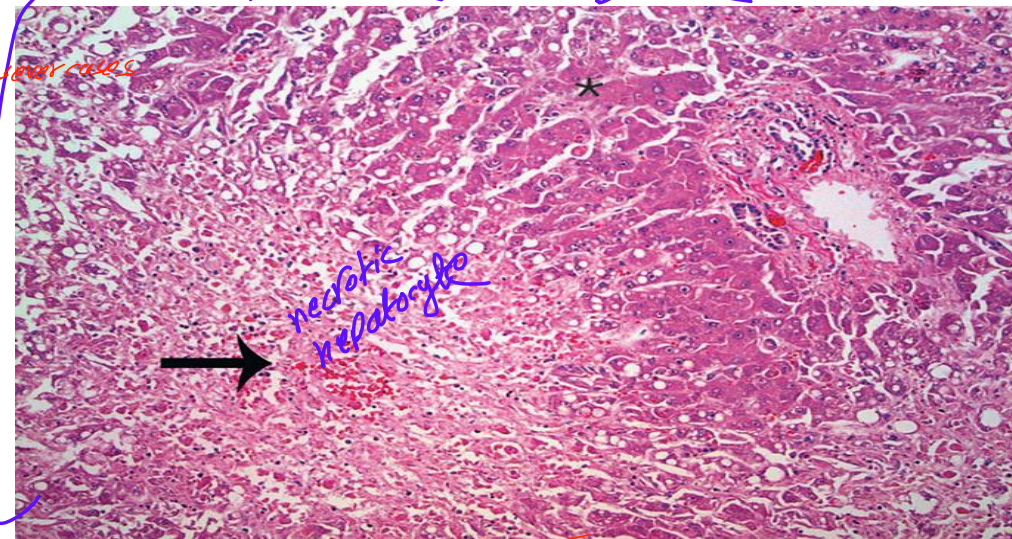
- HEV is an enterically transmitted, water-borne infection that usually produces a self-limiting disease.
- HEV is an unenveloped, positive stranded RNA virus in the Hepevirus genus.
- The virus typically infects young to middle-aged adults.
- HEV is a zoonotic disease with animal reservoirs that include monkeys, cats, pigs, and dogs.
- A characteristic feature of HEV infection is the high mortality rate among pregnant.

III. Biopsy.



Fulminant Liver Disease

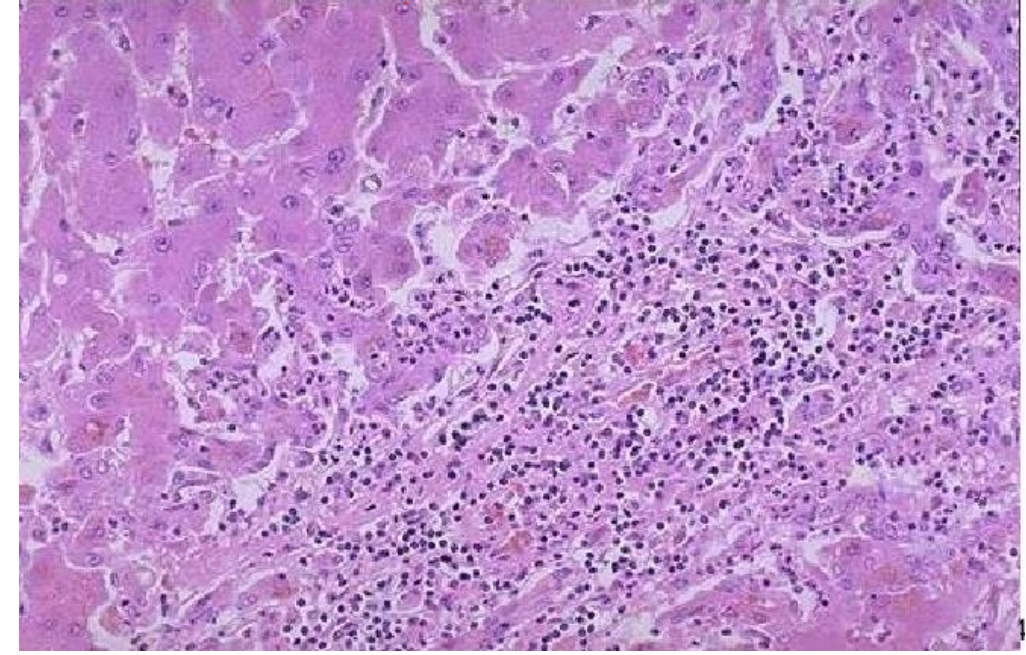
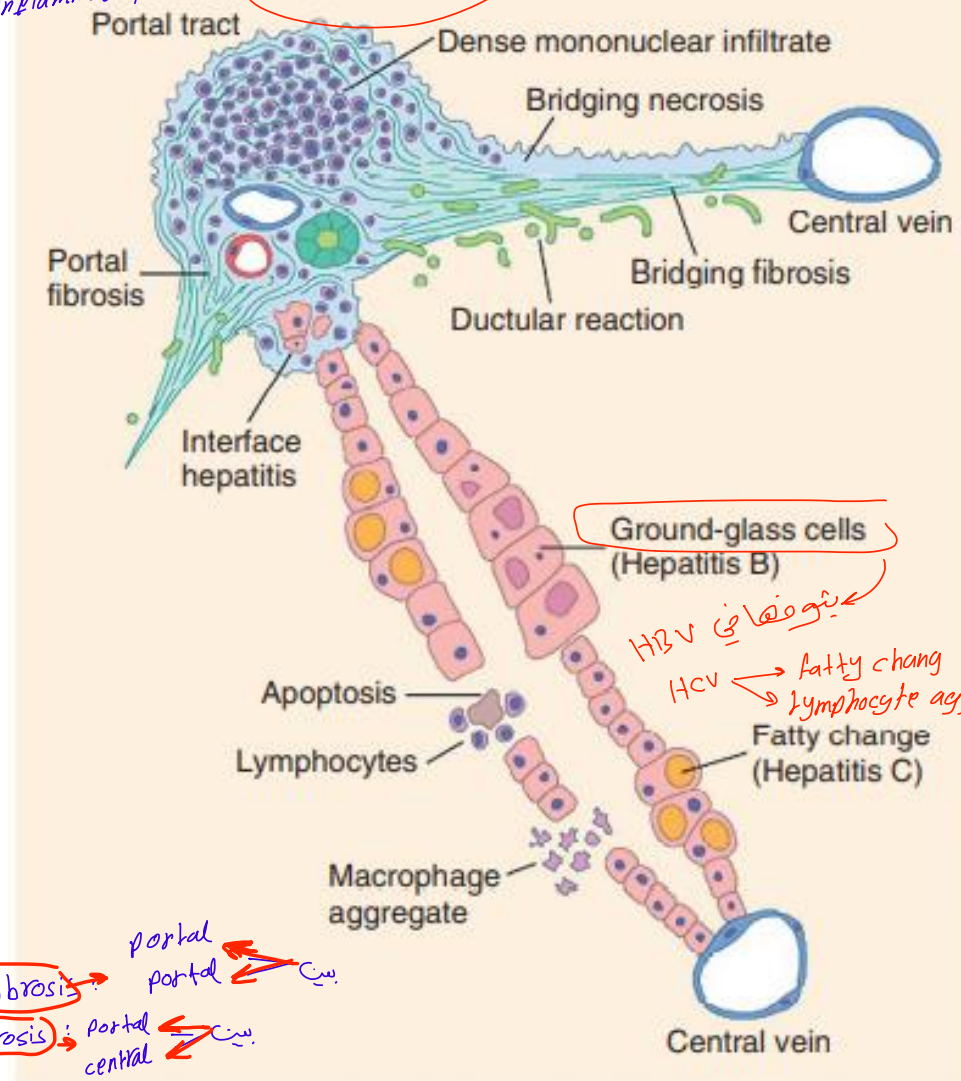
- بشوفة في :-*
- ① HBV if Acute in severe cases
 - ② HBV " "



hepatocyte necrosis في Fulminant

lymph...
 plasma cell
 fibrosis
 inflammation

CHRONIC HEPATITIS



normally

توقف من
 (1-2) Bile duct
 in portal tract
 فاكتر او فاكتر اذا
 طيري خيل

interface fibrosis → portal portal
 Bridges fibrosis → portal central

تتوالد
 Liver cirrhosis

HBV
 HCV → fatty change
 → lymphocyte aggregation

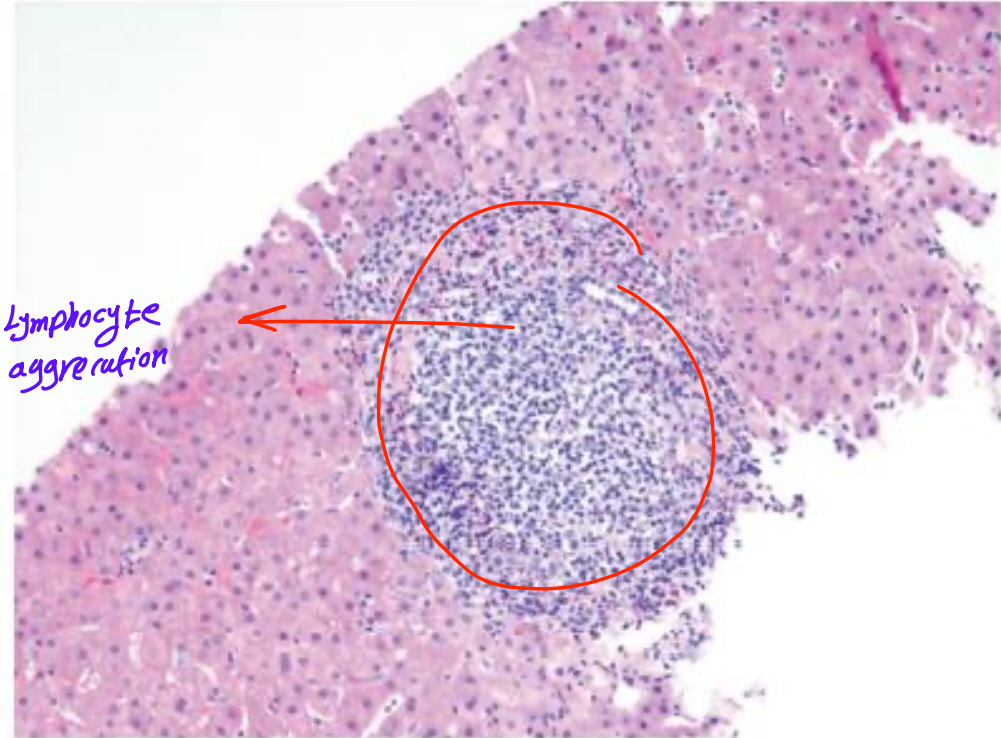


Fig. 16.15 Chronic viral hepatitis due to HCV, showing characteristic portal tract expansion by a dense lymphoid infiltrate.

fat lymphocyte

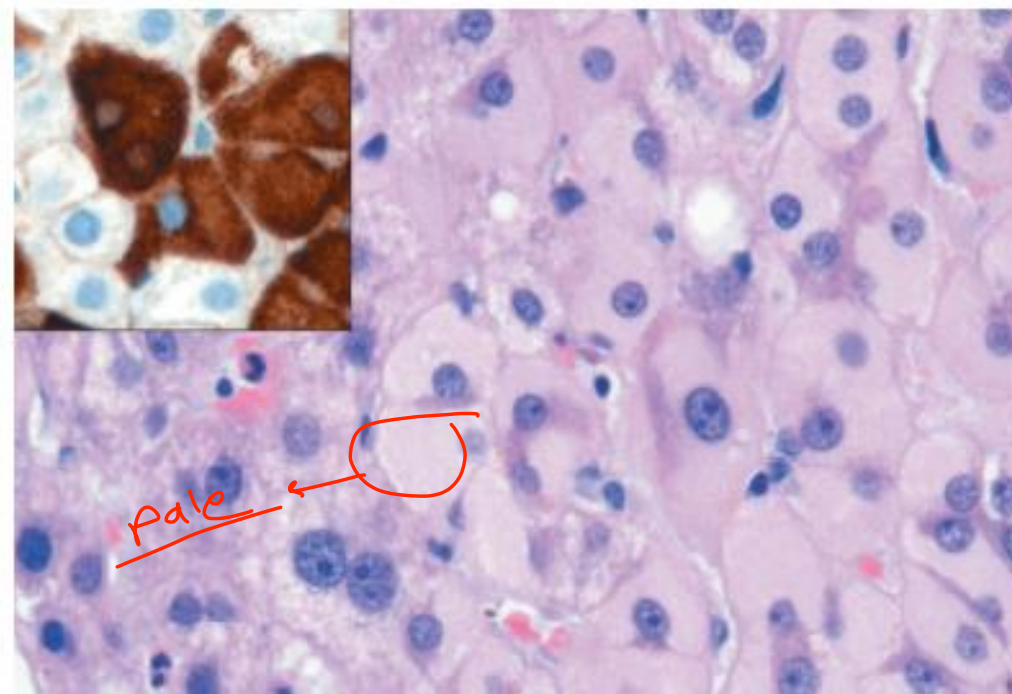
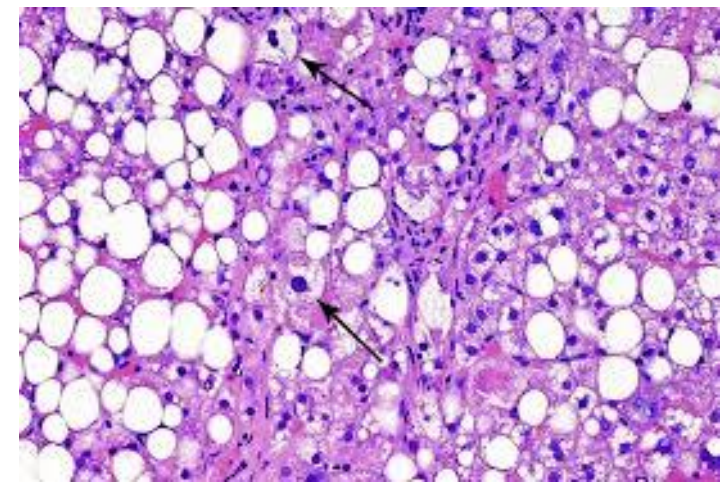
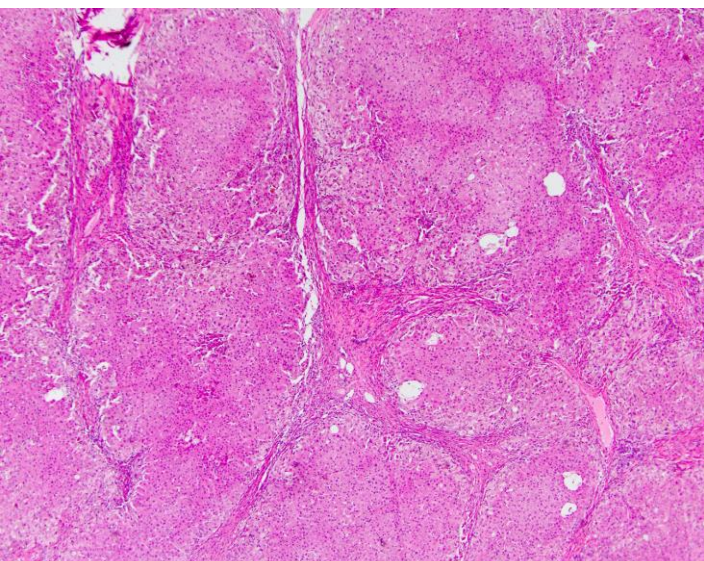
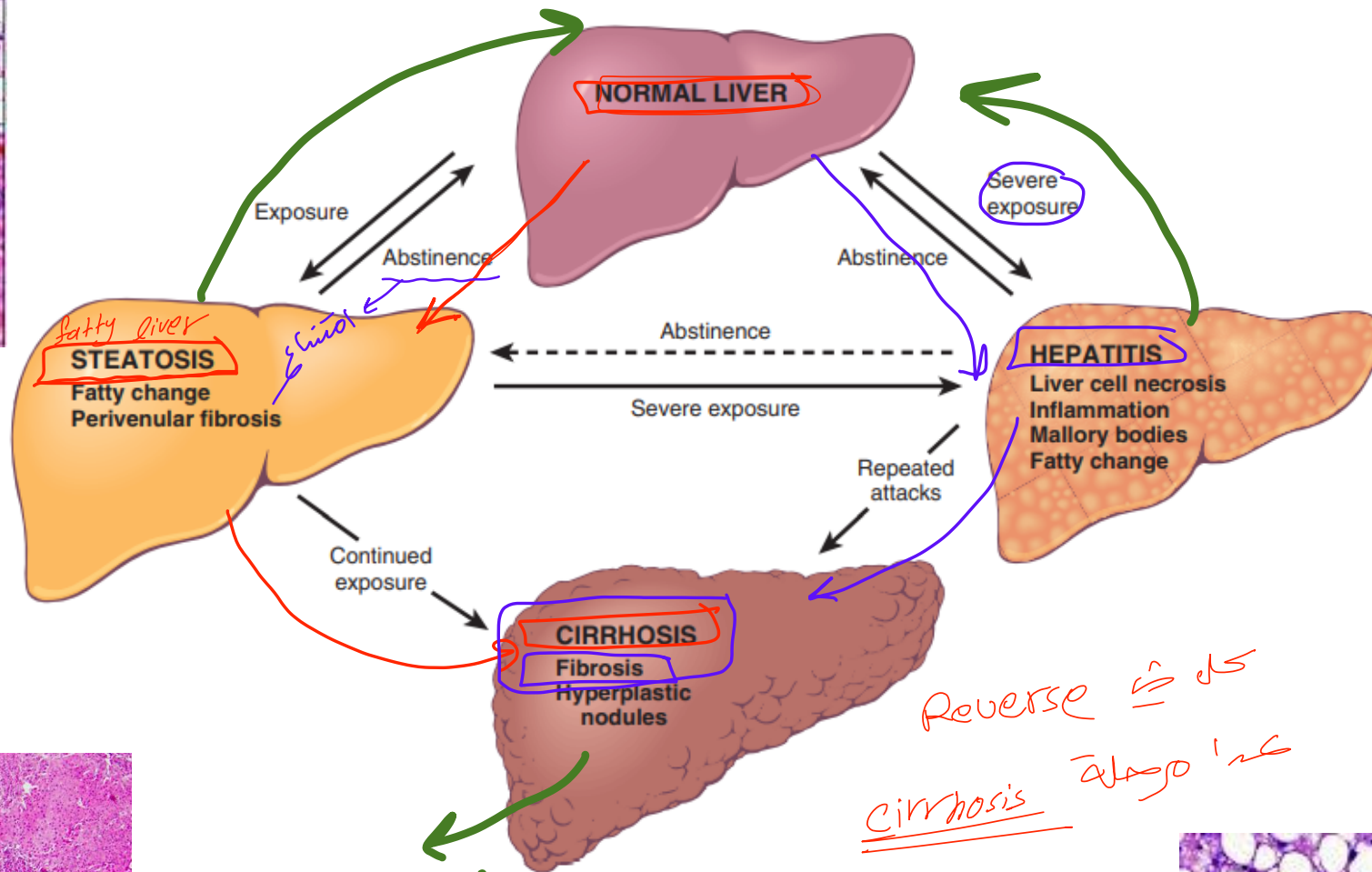
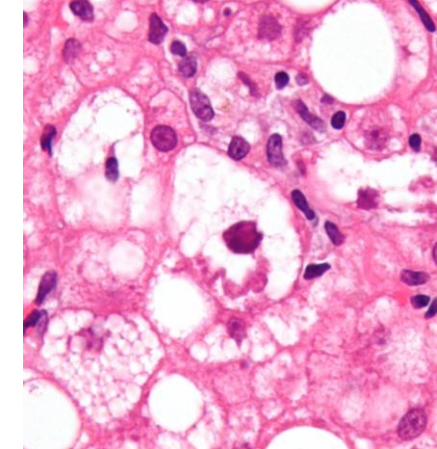
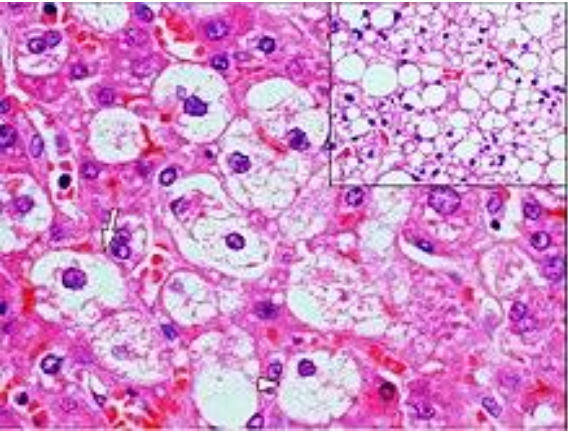


Fig. 16.14 Ground-glass hepatocytes in chronic hepatitis B, caused by accumulation of hepatitis B surface antigen. Hematoxylin-eosin staining shows the presence of abundant, finely granular pink cytoplasmic inclusions; immunostaining (inset) with a specific antibody confirms the presence of surface antigen (brown).



Alcoholic Liver Disease

- Excessive ethanol consumption causes more than 60% of chronic liver disease in Western countries and accounts for 40% to 50% of deaths due to cirrhosis.
- Short-term ingestion of as much as 80 g of ethanol per day generally produces mild reversible hepatic changes.
- Chronic intake of 40 to 80 g/day is considered a borderline risk factor for severe injury.
- women are more susceptible than men to hepatic injury??



Reversible
 (ن)
 تشمع

Reverse is
 cirrhosis stage