

DOCTOR 2020 | JU



# VIROLOGY

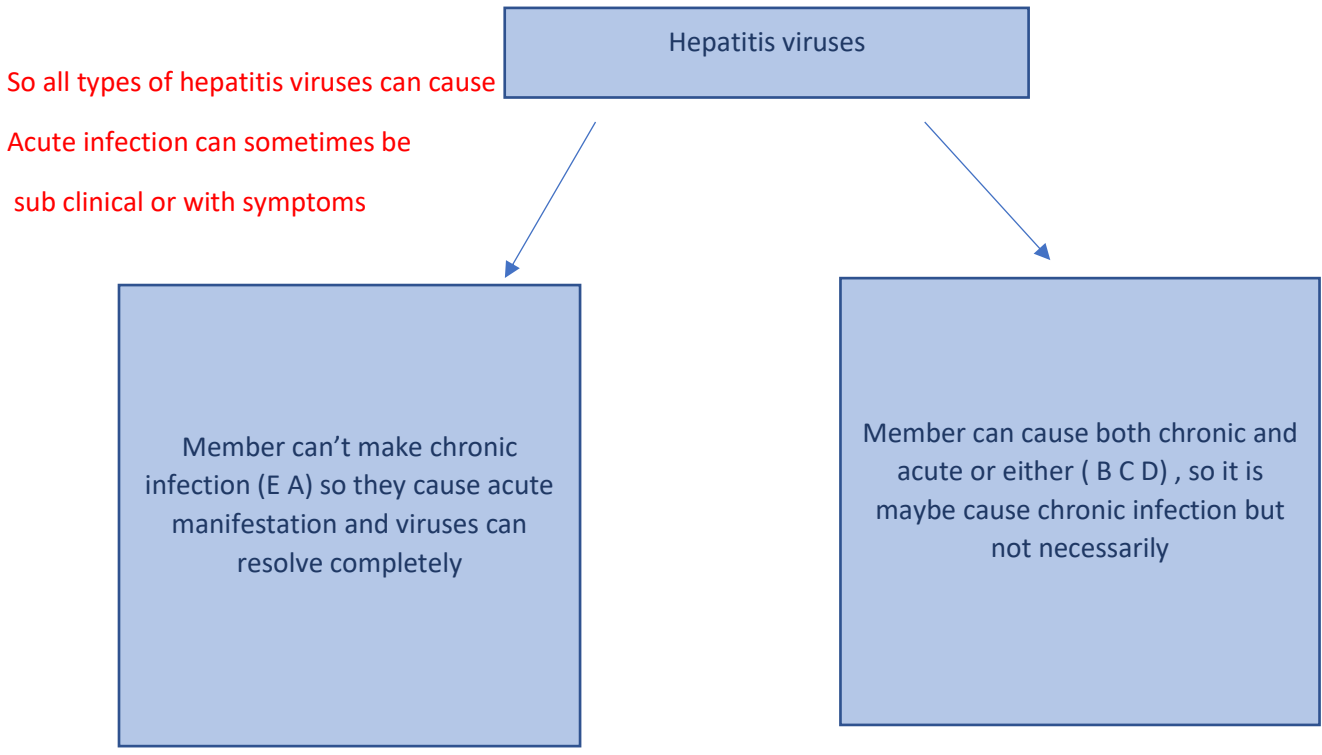
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We have 5 viruses mainly associated with hepatitis ( A B C D E ) however other viruses can cause liver inflammation like yellow fever virus, cytomegalovirus, Epstein-Barr virus, herpes simplex virus, rubella virus, and the enteroviruses so it can cause hepatitis but it can't consider a member of hepatitis viruses **because infection does not primary in liver** .

Hepatitis D&E are less clinically important in Jordan.



**\*\* D is defective virus need B virus help**

The age here most important factor to determine if the viral infection( C B ) can lead to chronic infection or not , also it is important in determining a clinical manifestation

Adults	Children
More than 90% who infected with hepatitis B they have acute infection + symptomatic + the body can get rid of virus completely	Especially when their age ( less than 1 year ) in most cases will lead to chronic infection
Developed immune system so most infection led to symptoms * Jaundice and lead in most cases to icteric hepatitis (liver inflammation + Jaundice) <b>see the picture in next page</b>	Immune system non developed completely so less symptoms appear also maybe in most cases be asymptomatic and anicteric hepatitis (no Jaundice) <b>As rule in hepatitis the symptoms appear because of immune response not because viral pathogenesis</b>

**\*\*\*\* But that doesn't mean all infected children with B, C lead to chronic infection and the same thing in adult we have small percentage ( less than 10%) of adults can have chronic infection.**

- Chronic infection/ acute infection more in hepatitis C than B

Drugs & Diseases > Gastroenterology > Hepatitis A Q&A

# How is the icteric phase of hepatitis A virus (HAV) infection characterized?

Updated: May 08, 2019 | Author: Richard K Gilroy, MBBS, FRACP; Chief Editor: BS Anand, MD [more...](#)

References



In the icteric phase, dark urine appears first (bilirubinuria). Pale stool soon follows, although this is not universal. Jaundice occurs in most (70%-85%) adults with acute HAV infection; it is less likely in children and is uncommon in infants. The degree of icterus also increases with age. Abdominal pain occurs in approximately 40% of patients. Itching (pruritus), although less common than jaundice, is generally accompanied by jaundice.

more than 70 members  
Hepatitis A is 72 member

it is contain other members that can cause hepatitis  
for example: - yellow fever virus

TABLE 35-1 Characteristics of Hepatitis Viruses

Virus	Hepatitis A	Hepatitis B	Hepatitis C	Hepatitis D	Hepatitis E
Family	Picornaviridae	Hepadnaviridae	Flaviviridae	Unclassified	Hepeviridae
Genus	Hepatovirus	Orthohepadnavirus	Hepacivirus	Deltavirus	Hepevirus
Virion	27 nm, icosahedral	42 nm, spherical	60 nm, spherical	35 nm, spherical	30-32 nm, icosahedral
Envelope	No	Yes (HBsAg)	Yes	Yes (HBsAg)	No
Genome	ssRNA	dsDNA	ssRNA	ssRNA	ssRNA
Genome size (kb)	7.5	3.2	9.4	1.7	7.2
Stability	Heat and acid stable	Acid sensitive	Ether sensitive, acid sensitive	Acid sensitive	Heat stable
Transmission	Fecal-oral	Parenteral	Parenteral	Parenteral	Fecal-oral
Prevalence	High	High	Moderate	Low, regional	Regional
Fulminant disease	Rare	Rare	Rare	Frequent	In pregnancy
Chronic disease	Never	Often	Often	Often	Never
Oncogenic	No	Yes	Yes	?	No

ds, double stranded; HBsAg, hepatitis B surface antigen; ss, single stranded.

So (E AND D) more resistant to hard conditions

Very close to A

Hepatitis D  
is the smallest of known human pathogens and resembles subviral plant pathogens (i.e. viroids)

Especially virus A large outbreaks can happen when we have fecal contamination of water takes place, so the Seroprevalence (is the number of persons in a population who test positive for a specific disease based on serology specimens) for hepatitis A and E is high in contaminated places (developing countries) so the children A & E infected in childhood, when they become adults most of them will be seropositive

**\*\* hepatitis A infection will Lead to Life long immunity** لذلك إعادة التعرض للفيروس لن تسبب الإصابة

So if there's a contaminated water in developing countries the adults will be protected لانهم من الأساس تعرضوا للفيروس و هم صغار فما رح يكون فيه زي وباء

Unlike developed countries (good hygienic conditions) adult not exposed to viruses in their childhood so that results in outbreaks

**\*\* From an epidemiological side virus E more important because we have a vaccine for A virus even in developed countries we have a lot of people are protected from A because a vaccination rather than previous exposure**

Both viruses A&E have ssRNA positive sense genome. (very similar in size)

Transmission for B C D viruses.....

1) Needle stick injuries (are wounds caused by needles that accidentally puncture the skin.) and that happen mainly by recapping needle

<https://youtu.be/bEeAo2jCjw>

It is dangerous issues between 10 people 3 infected by Hepatitis B by the Needle stick injuries

2) Blood transfusion (it is rarely) because we test blood donor to insure that is not hold (hepatitis B, HIV, hepatitis C and Treponema pallidum bacteria which cause syphilis \*this bacteria transmitted sexually and get indication about the behavior for this donor)

3) Injection drug use (needle sharing) is common between drug abuser متعاطي المخدرات

4) Vertical transmission from mother to child in all state maybe occur \*prenatal, postnatal and neonatal And remember vertical infection is associated with higher portion of chronic infection أصاب الأطفال

5) Sexual transmission especially in hepatitis B (hepatitis C more common in males homosexual)

● Most common of mood transmission in hepatitis C & D is injection drug use

● In countries which have high hepatitis B chronic infection. → Mode of transmission (vertical transmission) and that help in progress virus in adult لو فرضا بنت صغيرة ولدت بهاي العدوي و صار مزمن عندها بعد عشرين سنة يكون لسه موجود بتتزوج و بتحمل و بتنقله لاطفالها

● Hepatitis B virus is the only virus in hepadnaviridae family that can cause disease to humans.

### Hepatitis A virus

○ Naked virus (more resistant so it can live in surfaces like water or food items for long time\*2 weeks or more)

- ssRNA
- Transition of this virus associated in many countries (developed countries mainly) with consumption of seafood (raw مطبوخة) like shellfish (the virus live in it (because they can get it from contaminated water) and it is hard to get rid of it.
- Occupation periods (short 10-50 (extreme) \* **than in most cases just maybe take 2-3 weeks** and it is similar to hepatitis E....when virus enters the body (by contaminated food or water) then to GI tract small intestine to liver try to initiate inflammation
- No antiviral drug to hepatitis A, we provide supportive therapy
- 1% from cases in acute infection result in Complete disruption of liver function like detoxification ——lipid soluble accumulation ——

Hepatic encephalopathy is **a nervous system disorder brought on by severe liver disease.**

When the liver doesn't work properly, toxins build up in the blood. These toxins can travel to the brain and affect brain function, also it happens in all hepatitis viruses in 1% and it is called

Fulminant hepatic failure (FHF) is defined as **severe acute liver failure in a patient with no preexisting liver disease**, with encephalopathy developing within 2 weeks of the first manifestation of liver disease.

One of the earliest markers to indicate liver injury is elevated PT.

- Acute infection symptoms **for all hepatitis viruses** .....
- 1) Prodromal fever \* a prodrome is an early sign or symptom (or set of signs and symptoms) that often indicates the onset of a disease before more diagnostically specific signs and symptoms develop
  - 2) Nonspecific body in all over the body like anorexia and generalized weakness, myalgia and Arthralgia describes **joint stiffness**

Start liver enzyme raise (because the virus replication in hepatic cell that contains enzyme when this enzyme starts leaking to blood here there is a distraction of hepatic cell) \* **one of this enzyme ALT (Alanine aminotransferase) in cytosol also AST (in mitochondria) show a problem in liver**

\*Note ...ALT/AST high —hepatitis virus, AST/ALT high——alcoholic liver disease because a detoxification for alcohol happened in mitochondria.

3) Distinct symptom— Jaundice is a condition in which **the skin, whites of the eyes and mucous membranes turn yellow** because of a high level of bilirubin because of

\*Excess production hemolysis of RBC because the bilirubin comes from heme group

\*Less excretion —because of problems in liver like viral hepatitis

4) obstructive Jaundice in hepatitis b (in adults, acute hepatitis)

Note\*\* bilirubin metabolism to get rid of it happen in

- 1) 2/3 GI tract
- 2) 1/3 renal secretion

In hepatitis there is a problem in excretion by GI tract so we will have pale stools and all excretion will be by renal secretion resulting dark color urine

Why are stools pale in hepatitis? ^

Cirrhosis of the liver and hepatitis **reduce or eliminate bile salts that help the body digest food** and absorb nutrients. Gallstones or sludge in the gallbladder reduce the amount of bile that reaches your intestines. Not only may this cause pain, but it can also turn your stool yellow.

Note: from epidemiologic perspective, due to highly hygienic behaviors in our Jordanian population the percentage of positive serotype in adults get shifted (less children get exposed to contaminated food or water), so we must be aware of the importance of vaccination to avoid the outbreak of hepatitis viruses.

هيك بتكون خلصت المحاضره

في أشياء الدكتور ما شرحها زي

Structure and Composition

و غيره

فلازم ترجعو للكتاب