* hepatitis → inflammation of liver.
↳ presence of inflammatory cells in liver.

Causes → viruses, bacteria, protozoa, + non infectious agents ↳ smoking toxins - drugs

Viral Cause
↳ Major cause to infectious liver disease ⊕ additional to hepatitis viruses causing sporadic cases of hepatitis: ① yellow fever virus
② Cytomegalo virus.
③ herpes simplex ④ Rubella
⑤ enteroviruses
↳ all infect liver.

all infections by viruses can't be distinguished from each other clinically, (hepatitis) usually hepatocellular in serum increase (AST) as part of aminotransferase, as well as alanine amino transferase. to allow diff from other liver diseases.
general rule. Ration ALT/AST > 1 indicates cytoplasmic damage mark words a hepatitis).

although all of these viruses directed toward liver. and basic hepatitis symptoms are similar. it differ ① structure. ② Mood of Replication.
③ Mood of transmission - ④ life cycle.

* Most causes of acute viral hepatitis in children and adults are caused by one of the 5 following agents.
① H. virus A previously known as infectious hepatitis +ss RNA, non enveloped
② H. virus B Serum hepatitis Ds DNA, enveloped.
" " C common cause for post transfusion hepatitis +ss RNA. enveloped.
" " D Defective / Delta virus, dependent in co infection with H-B -ss R
" E enterically transmitted hepatitis - like hepatitis A virus Regardless

* regardless of virus type identical histopathological Legions are observed in liver during acute disease. These viruses aren't cytopathic but immunological Response that lead to Those lesions Mainly.

* hepatitis A virus *

distinct Member of pico family, another name for it is entero virus 72, RNA virus non enveloped thus only One Serotype. and there is 7 genotypes that are known for it.

Replication: liver excreted bile then excreted in feces of infected persons. two weeks before onset of symptoms. up to one week post Symptoms

established for causative agent of more than > 40% to 50% of acute hepatitis cases. The Most Common viral hepatitis virus.

Spread by feco-oral root. outbreaks associated with contaminated food and water. human appears to be major natural hosts. of hepatitis A

* enterically transmitted virus → faco oral root.

They can be demonstrated in feces by electron Microscope in feces and no chronic infection for hep A same for e initially only IgM antibody Response then followed by IgG antibody Response and give life long immunity post infection, so there is no chronic infection and no Carrier State

* epidemiology of hepatitis A

gobal epidemiology / Most common type of viral hepatitis.
Most common ① outbreaks ② epidemics.
Commonly seen ① children ② young adult
90% of infected children and up to (25-50)% of infected adults have inapparent but productive infection

(fecal oral root) arise from ingestions of contaminated food / water
① over crowding ② poor sanitation → triggers.

hepatitis A → infectious hepatitis. Causes disease clinically visible or symptomatic in young children and no carrier / chronic state.
More than 90% of adults pop in mainly developing countries. shows developing previous hepatitis A infection. and travelers from developed country who enter these endemic areas are particularly susceptible.
patients are more contagious in 2 weeks prior the onset of clinical disease characterized by jaundice mainly high prevalence of anti-hepatitis A antibodies usually in people ↑ prevalence of hepatitis A and antibodies against it.

* Clinically
infectious dose for hepatitis A is less than 100 particle enough to establish infection Contagiousness / communicability usually 2 wks before onset of symptoms usually characterized by onset of jaundice
Jaundice usually observed in 70% to 80% of adults but 10% in children, Mainly less than 6 yrs

The most common presentation of hepatitis virus infection A is
asymptomatic → most children

usually symptomatic → adults.

usually 2 phases → pre clinic phase → flu like illness (nausea, vomiting, anorexia)
→ clinic phase → jaundice, abdominal pain.
→ hepatosplenomegaly
→ pale stool / dark color urine

Some times Sudden onset of fever, anorexia, pain (right upper qud within several days → classical history in symptomatic patients
dark urine / pale colored stool (clay)
(1-5) days before clinical jaundice. liver is enlarged and tender
Recovery take from days to weeks
99% of hepatitis A are self limiting (2-4) wks no carrier
no chronic → لا يوجد
cases.

* Some patients might suffer from full fulminant hepatitis < 1% of infected patients.

* Many persons have serological evidence of acute hepatitis A infection ① asymptomatic ② mildly ill without jaundice

unlike hepatitis B virus. h.A can't initiate chronic infection. and not associated with hepatic cancer
1% that may suffer from full fulminant liver disease → < 18
and Mortality Rate (0.1 - 0.2)% for those who suffer from full fulminant.

* diagnosis according to clinical picture mentioned. history. ph. examination and you look for liver biochemistry there is elevated liver enzymes mainly ALT as well as AST which proceed jaundice when stool urine Serum bilirubin levels high

Confirmation & diagnosis:

Hematological test: leucopenia? with relative lymphocytosis in infected patient and ↑ (ESR) usually elevated

Viral Markers / Serology for hepatitis virus that can be detected are usually anti-hepatitis virus IgM in acute infection. it remains usually high for up to 3 to 6 months followed by IgG antibodies to hepatitis virus that become predominant after year and common in general population over age of 50 yrs.

there how immune electron microscope, we can identify virus particals: in fecal specimen and isolation of virus in cell culture from the serum/blood

* Typical Serology Course of hepatitis A virus, initially can be identified in the stool ⊕ raised liver function test. ALT / AST which are noted earlier in H.A.V followed by anti-hepatitis A virus IgM that start rising usually one month post exposure and peaks on 3rd month post exposure before being replaced with IgG antibodies to hepatitis A virus.
previous infection and vaccine → life long immunity

treatment? no specific treatment (supportive measures indeed adequate nutrient and bed rest
avoidance to exposure to contaminated food / water

2 ways of treatment → passive immunization → prophalaxis with immune Serum globulin before or early in incubation period
→ active immunization

less than 2 wks post exposure (5) 80% - 90% if in recovery

2 types of immunizations

① passive immunization → prophylaxis with immune serum globulin given usually before or early in incubation period. less than 2 wks post exposure
usually 80% - 90% effective in preventing clinical illness
Post U.S.V. infection

② active? passive? when immune serum globulins are protected if given before or during incubation periods of

② active immunization
There is vaccine against hepatitis A virus with both killed vaccine that usually induce antibody titer similar to those induced with the wild virus type
100% protective

preventive Major of Spread of hepatitis → interfering fecal-oral route of Spread of virus accomplished by avoiding potentially contaminated water or food especially under Cooked Shellfish and proper hand washing

usually important that chlorine included in drinking water is generally sufficient to kill virus.

E
* hepatitis e virus * Similar to A virus. ② Spread by fecal oral route.
an a virus similar but distinct from A? virus
Viral particles in Stool are Spherical usually with 30 nm and unenveloped exhibit Spike on their Surface like hepatitis A. infection with is frequently Subclinical, when Symptomatic it causes only anicteric
That may culminate, high risk group with hepatitis & pregnant women
Malnourished people, endemic and developing areas it has highest

and infection is associated with contaminated drinking water, it doesn't appear to spread from person to person. Most cases have been identified in developing countries with poor sanitation; recurrent epidemics have been described in these areas.

incubation period → 40 days (2–8) weeks

diagnosis → presence of IgM

(paracetamol)

* Mostly subclinical specially in children

Clinically similar to hepatitis A infection except bilirubin levels are higher and jaundice is deeper and more prolonged.

normal case fatality rate is 1 to 2 % but became higher reaching 10 to 20 percent in pregnant and malnourished

There is no chronic stage or carriers

diagnosis is by excluding other types as well as molecular PCR

- Supportive treatment.