Viral hepatitis

- Viral hepatitis A
- Viral hepatitis B
- Viral hepatitis C
- Viral hepatitis D (delta hepatitis)
- Viral hepatitis E
- Viral hepatitis G

Viral hepatitis A

- Infectious hepatitis, Epidemic hepatitis, Epidemic jaundice, Catarrhal jaundice, Type A hepatitis, HA

1. Identification:

Onset of illness in adults in non endemic areas is abrupt with fever, malaise, anorexia, nausea and abdominal discomfort. After few days → jaundice.

Severity range: Asymptomatic (children) – mild illness (1-2 weeks) – severely disabling disease (several months).

Relapsing H for up to 1 year occurs in 15% of cases.

No chronic carriers.

CFR is low 0.1 – 0.3%; it can reach 1.8% for > 50 y.

Dx:

- IgM anti-HAV by EIA → ≥ 4 fold rise in paired sera.
- HAV RNA can be detected in blood and stools in acute phase.

2. Infectious agent:-

HAV RNA virus

the virus is fairly resistant to heat and chemicals and not affected by usual dose of chlorine in water.

3. Occurrence:-

- World wide.
- The annual incidence is about **10 – 50 / 100 000** population according to WHO estimate.
- Geographic endemicity levels: high, intermediate, or low.

High endemicity levels: adult usually immune and epidemics are uncommon.

Intermediate or highly endemic areas → Africa, Middle East, Asia, eastern Europe and central and south America.

3. Occurrence:- continue

- In low endemicity countries the disease occurs mainly in adolescents and adults.
- Because most of children have asymptomatic infections, they play important role in transmission of HA and serve as a source of infection.

4. Reservoir:

Humans, rarely chimpanzees.

5. Mode of transmission:

1. Person-to-person by fecal-oral route (directly or indirectly). HAV found in feces, reaches peak level 1-2 weeks before onset of symptoms and diminished rapidly after symptoms appear.

   contaminated water or foods → common source outbreaks (food handler …etc)
2. Injecting and non-injecting drug use → several outbreaks in USA and Europe.
3. Blood and clotting factors transfusion (donors in incubation period) has been reported, very rarely.
4. Sexual contact: homosexual men because of oral-anal contact.

6. Incubation period:

Average 30 days (range 15 -50 days).

7. Period of communicability:

2 weeks ← Jaundice → max up to 1 week

Chronic shedding of HAV in feces does not occur.

8. Susceptibility:

General. Immunity after infection probably last for life.

9. Method of control:

A- Preventive measures:

1) Educate the public …
2) Personal hygiene particularly food handlers….
3) Travelers to intermediate or highly endemic areas → vaccine prior to departure + IG if departure < 2 weeks.

A- Preventive measures:

4) **Immunization** (active, passive):

4 inactivated vaccines:

not used in children < 1 year.

Safe, effective.

2 doses (6-18 months apart) give long –term protection.

Note: IG if given after onset of symptoms, no benefit form it.

Indications of HA vaccine

A) In developed countries; (low endemicity) → high risk groups: chronic liver disease, clotting factor disorders, homosexual male, injecting drug users, lab workers and traveler to endemic areas.

B) Children in communities that have consistently elevated rate of HA.

C) Close personal contacts (household): vaccine + IG

Control of patient, contacts and environment

1. **Reporting :** (class II)
2. **Isolation:** enteric precautions during the 1st 2 weeks of illness, but no more than 1 week after the onset of jaundice.
3. **Disinfection:** of feces, urine and blood.
4. **Quarantine:** not applicable.
5. **Immunization of contacts:** (post exposure prophylaxis). vaccine and IG should be given as soon as possible, but not later than 2 weeks after exposure. **Only for close personal contacts.**
6. **Investigation of contacts and source of infection:** surveillance of household contacts
7. **Specific treatment:** none

Viral hepatitis B

- Serum hepatitis, Type B hepatitis, HB

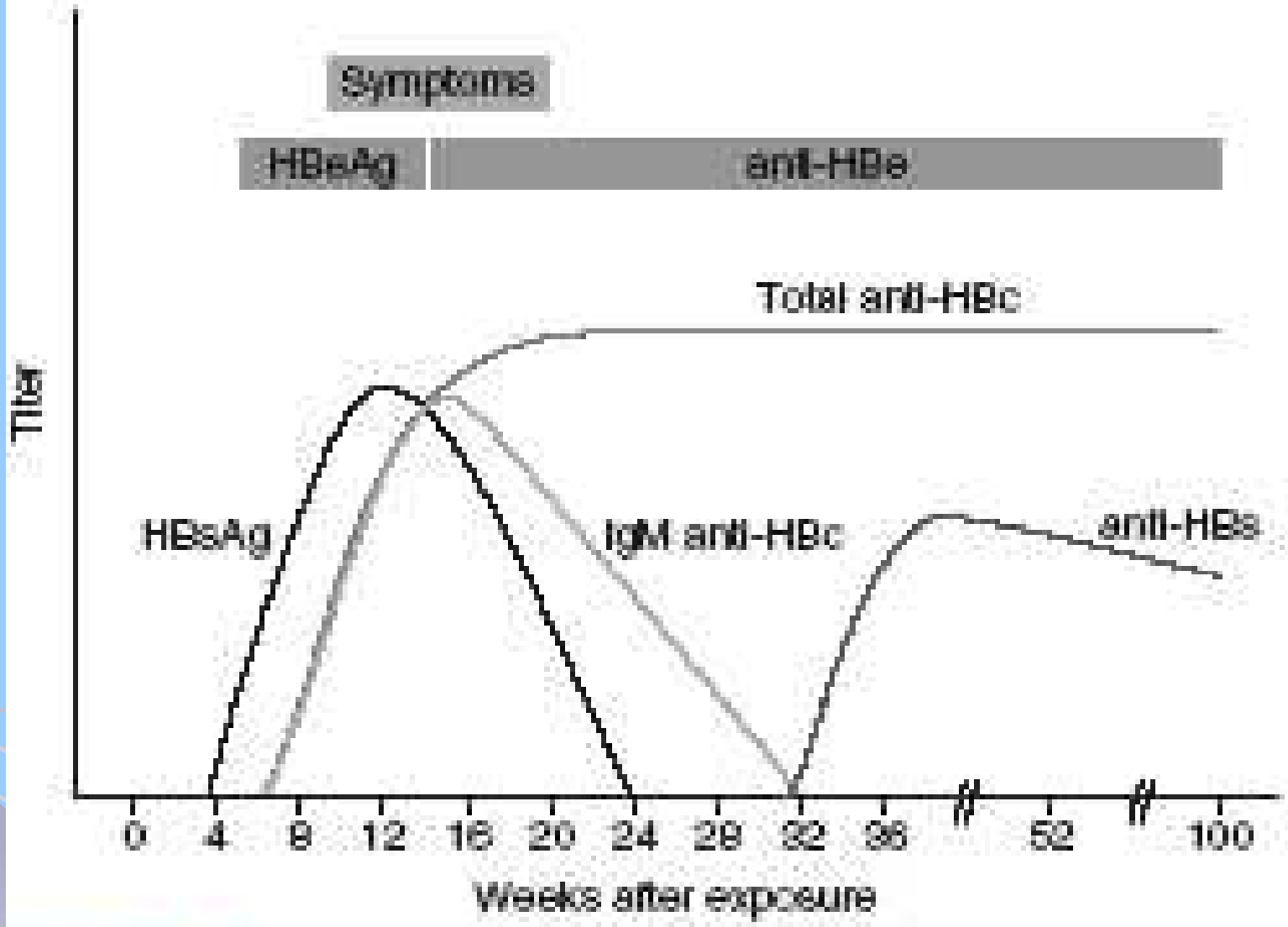

Figure 12-6. Serologic course for acute hepatitis B virus infection, with recovery. Anti-HBc, antibody to hepatitis B core antigen; anti-HBe, antibody to hepatitis early antigen; anti-HBs, antibody to hepatitis B surface antigen; HBeAg.

Identification:

Clinically recognized (icteric cases):

10% in children

30 – 50% in adults

Onset of illness is usually insidious with malaise, anorexia, nausea and abdominal discomfort. After few days → jaundice. Fever may be absent or mild

Severity range: Asymptomatic – severely fatal cases.

CFR is 1 %; it higher in > 40 y.

Chronic HB infection varies inversely with age:

Infant infected at birth → 90% chronic

children 1-5 years → 20 – 50%

> 5 y. and adults → 1 – 10%

15 - 25% of chronic → premature death from liver cirrhosis or hepatocellular Ca.

Up to 80% of hepatocellular Ca are caused by HBV worldwide.

Factors that increase occurrence of carrier state:

1. Infection early in life
2. Immunodeficiency state
3. Chronic liver diseases as hepatic schistosomiasis
4. Down syndrome
5. Risky groups as hemodialysis. addicts, hemophilic, homosexual ..etc.

Chronic carrier define as the presences of HBsAg +ve for > 6 months.

Dx:

Demonstration in sera of Ag and/or Ab confirms diagnosis:

- HB surface Ag → HBsAg and anti-HBs Ab
- HB core Ag → HBcAg and anti-HBc Ab
- HB e Ag → HBeAg and anti-HBe Ab

anti-HBc Ab appear at the onset of illness and persists indefinitely so when detected in serum means current or past infection.

- High titer of IgM anti-HBc Ab indicate acute infection (IgM anti-HBc Ab usually disappear within 6 months).

HBsAg present in serum in acute infection and persist in chronic infection. The presence of HBsAg indicates that the person is potentially infectious.

2. Infectious agent:-

HBV DNA virus 1963

3. Occurrence:-

- World wide, endemic with little seasonal variation.
- WHO estimates: 2 billions people have been infected with HB (including 350 millions chronically infected)
- Each year: 1 million die from HB and over 4 millions new acute clinical cases occur.
- Endemicity levels:

HBsAg prevalence ≥ 8% highly endemic areas → most infections occur → infancy & early childhood.

2 -7% intermediate.

< 2% low endemicity.

4. Reservoir:

Humans, rarely chimpanzees .

5. Mode of transmission:

Body fluids capable of transmitting HBV include: blood and blood products; saliva, CSF, peritoneal, pleural, pericardial and synovial fluid; amniotic fluid; semen and vaginal secretions and any other body fluid containing blood.

- Parenteral (IV, IM, SC, ID) and permucosal exposure to infective body fluids.

Blood and clotting factors transfusion, hemodialysis, acupuncture, dentist, surgical procedures, needle stick, ear and nose piercing, tattoo parlors.

Injecting drug users → sharing needles, syringes or contaminated (blood) drug equipment

5. Mode of transmission:

- Sexual and close household contact with an infected person

  Sexual: male → female 3 times effective than female → male, multiple partners

  Anal intercourse → high risk for both,

- Vertical; mother to fetus transmission: the mechanism of perinatal transmission is uncertain, but most infections appears to occur at birth due to leak of maternal blood into the baby‘s circulation.
- Indirect inoculation of HBV via inanimate objects
- Toothbrushes and razors
- fecal-oral route or vector-borne transmission not occur.

6. Incubation period:

Average 60 - 90 days (range 45 -180 days).

7. Period of communicability:

All persons who are positive HBsAg are potentially infectious

weeks ← Jaundice → throughout acute disease and if chronic carrier remain infectious

chronic carriers (HBeAg +ve) → highly infectious

8. Susceptibility:

General. Disease is often milder and anicteric in children and asymptomatic in infants. protective Immunity may develop (HBsAg –ve and anti-HBs Ab developed).

9. Method of control:

A- Preventive measures:

1) Health education…, instructions to carriers…
2) Effective HB vaccines and IG.
3) Adequately sterilization of syringes and needles and lancets, use disposable equipment whenever possible, discourage tattooing.
4) In blood bank, all donors should be tested for HBsAg; reject all donors with a:
   i. History of viral H.
   ii. History of injecting drug users or drug addicts.
   iii. History of tattooing or receive blood in the past 6 months.
   iv. Paid donors (except in emergency)

Effective HB vaccines

- Safe, highly protective, immunity persist for at least 15 years, not contraindicated during pregnancy.
- Site: for infancy and children → anterolateral aspect of the thigh.
- For adults → deltoid muscle.

Indications of HB vaccine:

1. In all countries, **routine infant immunization** is the primary strategy in the prevention of HB infection.

   In Iraq 3 doses IM
   - 1st dose at birth
   - 2nd dose at 2 months age
   - 3rd dose at 6 months age

2. At high risk persons (preexposure immunization):
   a) Hemodialysis (CRF) and blood disorders patients.
   b) Homosexual men, promiscuity.
   c) Household contacts of HBsAg +ve.
   d) Health care workers; surgens.
   e) Travelers to intermediate or highly endemic areas (spend >6 months).

B- Control of patient, contacts and environment

1. **Reporting :** (class II)
2. **Isolation:** universal precautions to prevent exposures to blood and body fluids until HBsAg –ve and appearance of anti-HBs Ab.
3. **Disinfection:** of equipment contaminated with blood or infectious body fluids.
4. **Quarantine:** not applicable.

5. **Immunization of contacts:** (post exposure prophylaxis).

   vaccine and HBIG should be given as soon as possible. (IG given 2 doses one month apart)

   a) Infants born to HBsAg +ve mother → HBIG + 1st dose of vaccine [within 12 hours of birth].
   b) Accidental percutaneous → HBIG + start vaccine schedule [within 24 hours of exposure].
   c) After sexual contact with HBsAg +ve → HBIG + start vaccine schedule [within 14 days of last sexual contact].

6. **Investigation of contacts and source of infection:** surveillance of household contacts
7. **Specific treatment:** none. Alpha interferon, lamivudine for chronic HB.

Viral hepatitis C

- Parenterally transmitted non-A non-B hepatitis, Non-B transfusion associated hepatitis,

  HCV infection

Identification:

Similar to HB but less severe

Chronicity commoner (50 -80% develop chronic infection) → half of them develop liver cirrhosis or hepatocellular Ca.

2. Infectious agent:-

HCV RNA virus 1989

3. Occurrence:-

- World wide, HCV prevalence related directly to persons sharing injection equipment. World prevalence 3%.
- WHO estimates: approximately 130 – 170 million chronically infected with HCV

4. Reservoir:

Humans, rarely chimpanzees.

5. Mode of transmission:

Like HB but mainly parenterally

it’s the most common post-transfusion hepatitis (paid donors).

Sexual and mother to fetus also occur but less frequent than parenteral route.

6. Incubation period:

Average 40 - 60 days (range 2 weeks -6 months).

7. Period of communicability:

One or more weeks ← Jaundice → throughout acute disease and may persist in most persons for indefinitely

8. Susceptibility: General.

repeated infection may occur

9. Method of control:

Same as HB except that IG not used.

Rx of chronic HC → ribavirin + slow release interferon → 40 – 80% response rate but very expensive.

Ribavirin is teratogenic.

Steroids and acyclovir not effective.

Delta hepatitis

Viral hepatitis D

- Similar to HB always associated with a coexistent HBV infection (either co-infection with HBV or super-infection with chronic HBV).

2. **Infectious agent:** **HDV RNA virus**
3. **Occurrence:** World wide.
4. **Reservoir:** Humans, rarely chimpanzees.
5. **Mode of transmission:** Like HB
6. **Incubation period:** 2 – 8 weeks
7. **Period of communicability**: As HB
8. **Susceptibility:** As HB
9. **Method of control:** **As HB**

Viral Hepatitis E

Enterically transmitted non-A non-B hepatitis

- Similar to HA, no evidence of chronic form.
- CFR same HA except in pregnancy 20%
- Dx: clinically and by exclusion of other H

2. **Infectious agent:** **HEV** **RNA virus** 1990

3. **Occurrence:** World wide.
   epidemic (water contamination) or sporadic

4. **Reservoir:** Humans, rarely chimpanzees.

5. **Mode of transmission:** primarily fecal-oral route (may be a zoonotic disease)

6. **Incubation period:** 15 – 65 days

7. **Period of communicability**: unknown

8. **Susceptibility:** unknown

9. **Method of control:** As HA