Viral hepatitis

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Hepatitis

- Is inflammation of the liver.

Etiology

❑ Primary infection:

➢ Hepatitis A virus (HAV)
➢ Hepatitis B virus (HBV).
➢ Hepatitis C virus (HCV), was known as non-A non-B hepatitis,
➢ Hepatitis D virus (HDV) or delta virus.
➢ Hepatitis E virus (HEV).
➢ Hepatitis F virus (HFV).
➢ Hepatitis G virus (HGV).

❑ As part of generalized infection:

➢ (CMV, EBV, Yellow fever virus)

Continued ….

- Hepatitis F has been reported in the literature but not confirmed.
- Viral hepatitis is divided into two large groups, based on the mode of transmission:

1– Enterically transmitted hepatitis or water-borne hepatitis. This group includes hepatitis A and E viruses.

2– Parenterally transmitted hepatitis or blood-borne hepatitis. This group includes hepatitis B, C, D & G viruses.

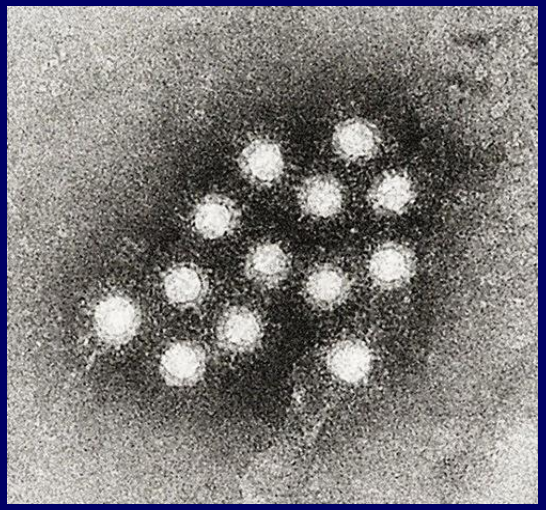
Characteristics of HAV

Family of *Picornaviridae.*

Genus: *Hepatovirus*.

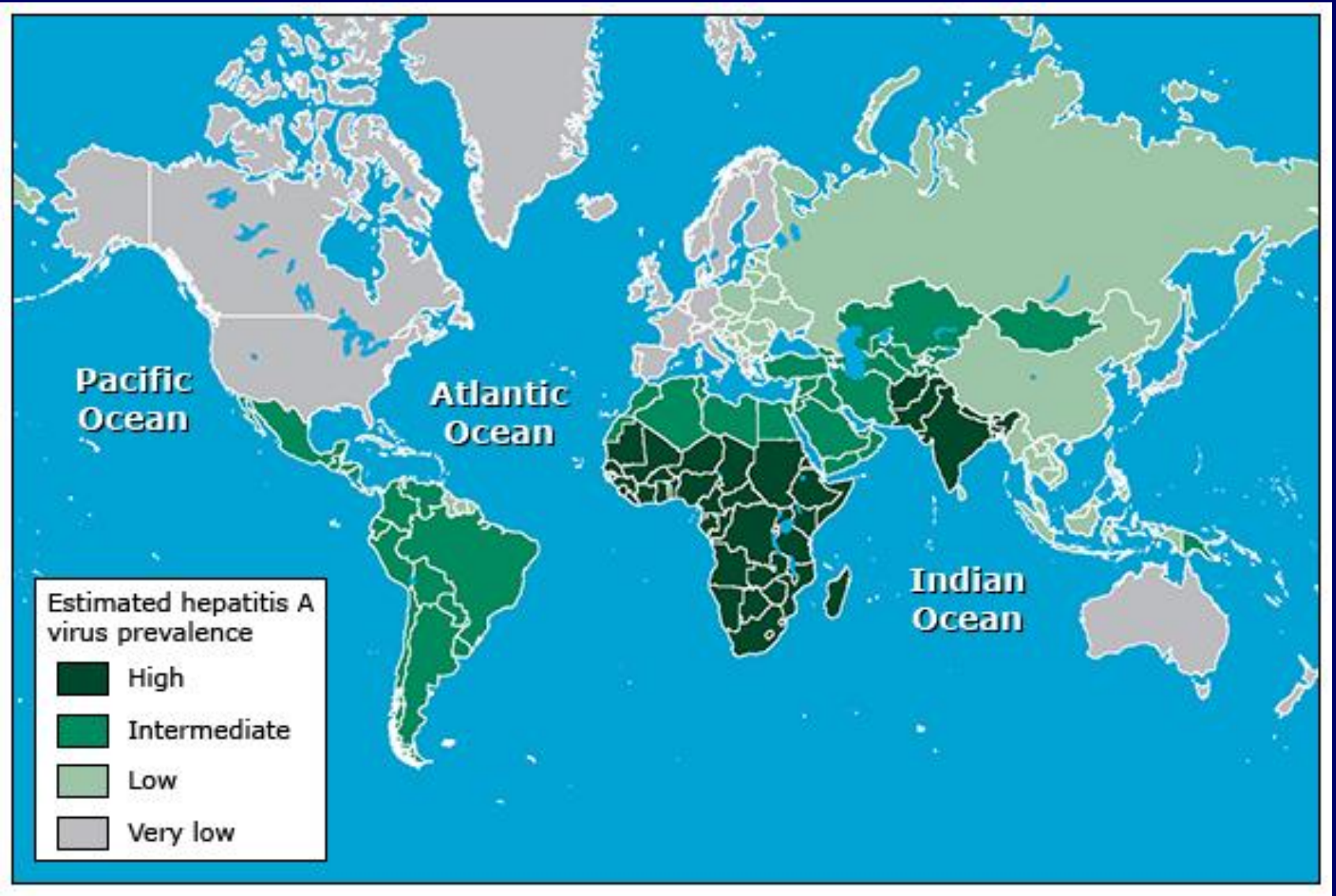
Virion non-enveloped and consist of:

- Icosahedral capsid.
- Positive sense ss-RNA.



- Short incubation hepatitis
- Infectious hepatitis
- Epidemic hepatitis

Geographic Distribution of HAV Infection



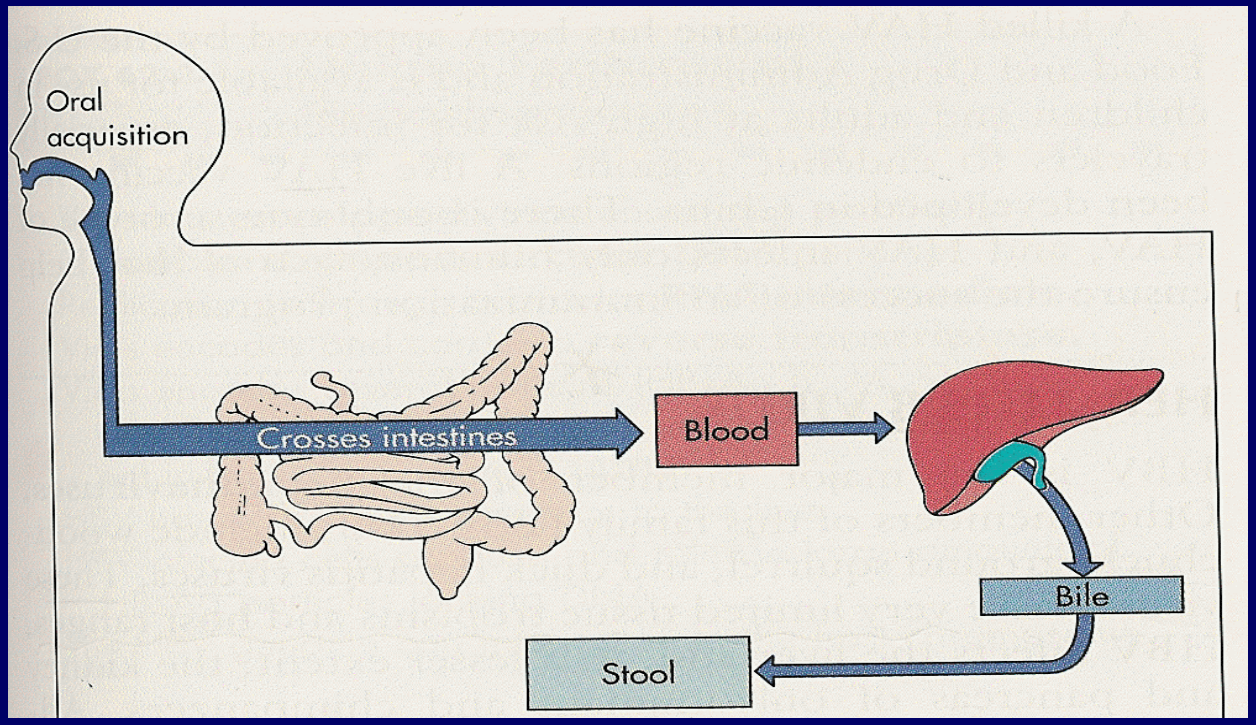
Epidemiology

HAV

- Distribution:
  - Worldwide, endemic in tropical countries
- Transmission:
  - Faecal-oral route [major route]
    Contaminated food &water
  - Sexual contact (homosexual men)
  - Blood transfusion (very rarely)
- Age:
  - In developing countries; children
  - In developed countries; young adults

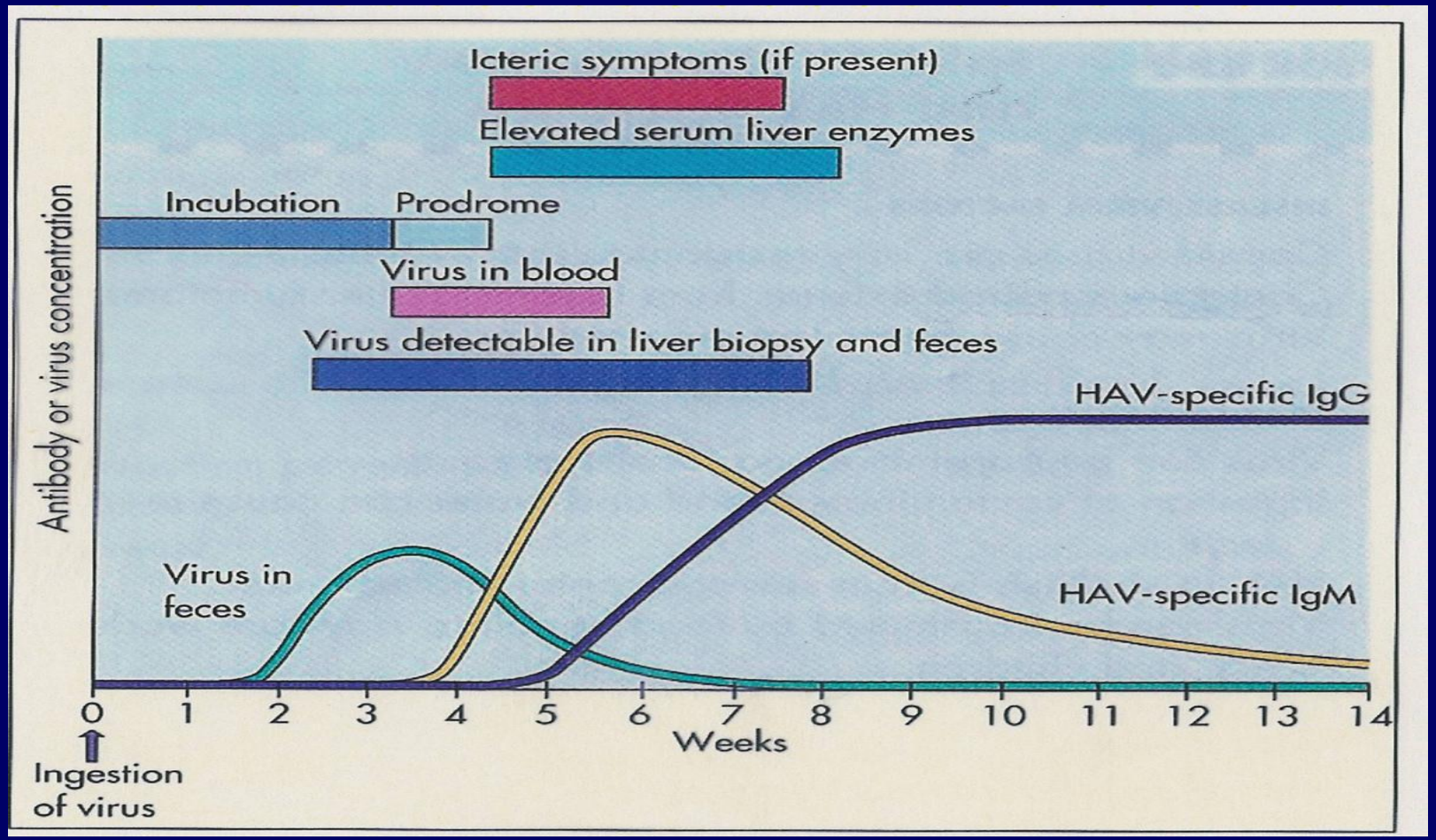
Pathogenesis

HAV



- The virus enters the body by ingestion of contaminated food. It replicates in the intestine, and then spread to the liver where it multiplies in hepatocytes.
- CMI ➡ Damage of virus-infected hepatocytes
  ➡ ⬆ ALT, AST & Bilirubin

HAV


Icteric symptoms (if present)
Elevated serum liver enzymes
Incubation
Prodrome
Virus in blood
Virus detectable in liver biopsy and feces
HAV-specific IgG
Virus in feces
HAV-specific IgM
Antibody or virus concentration
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Weeks
Ingestion of virus

Manifestations

HAV

- Hepatitis
  - Asymptomatic & anicteric inf → common
  - Symptomatic illness → ↑ age
  - IP=2-6 Ws
  - Pre-icteric phase: fever, fatique, N, V, & RUQP (right upper quadrant pain)
  - Icteric phase: dark urine, pale stool, jaundice

Prognosis

HAV

- Self-limited disease
- Fulminant hepatitis → rare
- Mortality rate ~ 0.1 - 0.3%
- No chronicity or malignancy changes

Lab Diagnosis

HAV

- Serology:
  - Detection of anti-HAV IgM → Current infection
  - Detection of Anti-HAV IgG → Previous infection
    → Immunity

Management

HAV

- Treatment:
  - Supportive therapy
- Prevention:
  - Sanitation & hygiene measures
  - Hig: Given before or within 2 Ws of exposure
    - Indication: travellers, unvaccinated, exposed patients.
  - Vaccine: inactivated (killed)
    - Given IM in two doses
    - >1 Y of age
    - Indication: Patients at high risk of infection and severe disease

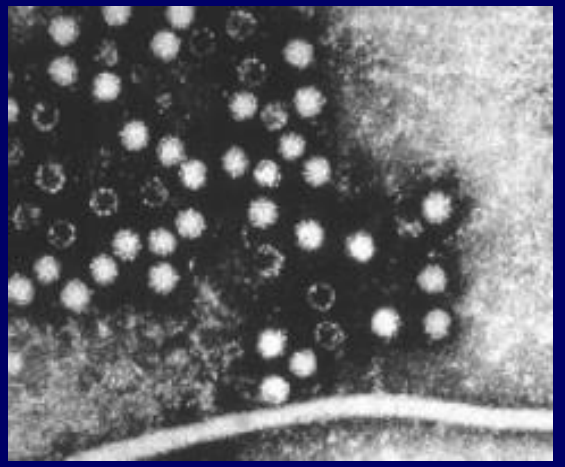
Characteristics of HEV

Family of *Hepeviridae*.

Genus: *Hepevirus*.

Virion non-enveloped and consist of:

- Icosahedral capsid.
- Positive sense ss-RNA.



HEPATITIS E VIRUS

- Epidemiology:
- Outbreak of water-borne & sporadic cases of VH
- Age; young adults
- 4 routes of transmission;
  - Water-borne
  - Zoonotic food-borne
  - Blood-borne
  - Perinatal

HEPATITIS E VIRUS

- Clinical features:
  - Similar to HAV infection with exceptions:
    - Longer IP =4-8 Ws
    - Chronic hepatitis, cirrhosis, but not HCC.
    - Fulminant disease
    - Mortality rate ~10 times > HAV

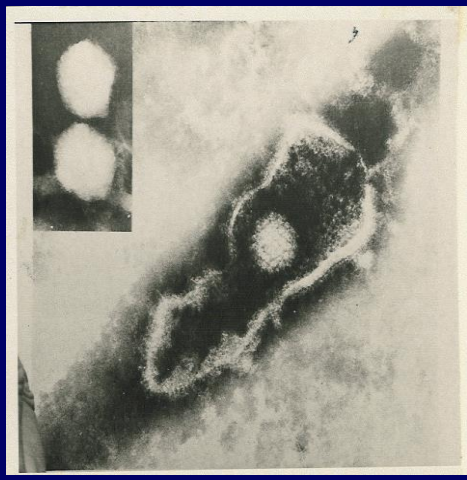
      ~ 1-3% [20% in pregnancy]

HEPATITIS E VIRUS

- Lab diagnosis:
  - ELISA → Anti-HE IgM
- Treatment:
  - Not specific
- Prevention:
  - Sanitation & hygiene measures
  - No Immunoglobulin
  - No vaccine

Herpesviridae

1- Herpes simplex virus type -1 HSV-1
2- Herpes simplex virus type -2 HSV-2
3- Varicella –Zoster virus VZV
4- Epstein-Barr virus EBV
5- Cytomegalovirus CMV
6- Human herpes virus type-6 HHV-6
7- Human herpes virus type-7 HHV-7
8- Human herpes virus type-8 HHV-8



dsDNA , Icosahedral & Enveloped Virus

Epstein – Barr Virus EBV

EBV

- It is lymphotropic.
- It has oncogenic properties; Burkitt's lymphoma
  Nasopharyngeal carcinoma

Epidemiology

- Distribution: worldwide
- Transmission:
  - Saliva [kissing disease]
  - Blood [rarely]
- Age:

  Socio-economic status: SE
  - Low SE class → early childhood
  - High SE class → adolescence

Clinical Features:

EBV

1-Immunocompetent host

- Asymptomatic
- Infectious mononucleosis [or glandular fever]
  - Mainly in teenagers & young adults
  - IP = 4-7 weeks
  - Fever, pharyngitis, malaise, hepatosplenomegaly & abnormal LFT, hepatitis.
  - Complications

    (acute air way obstruction, splenic rupture, CNS inf)
- Chronic EBV infection

2- Immunocompromised host

- Lymphoproliferative disease (LD)
- Oral hairy leukoplakia (OHL)

Diagnosis:

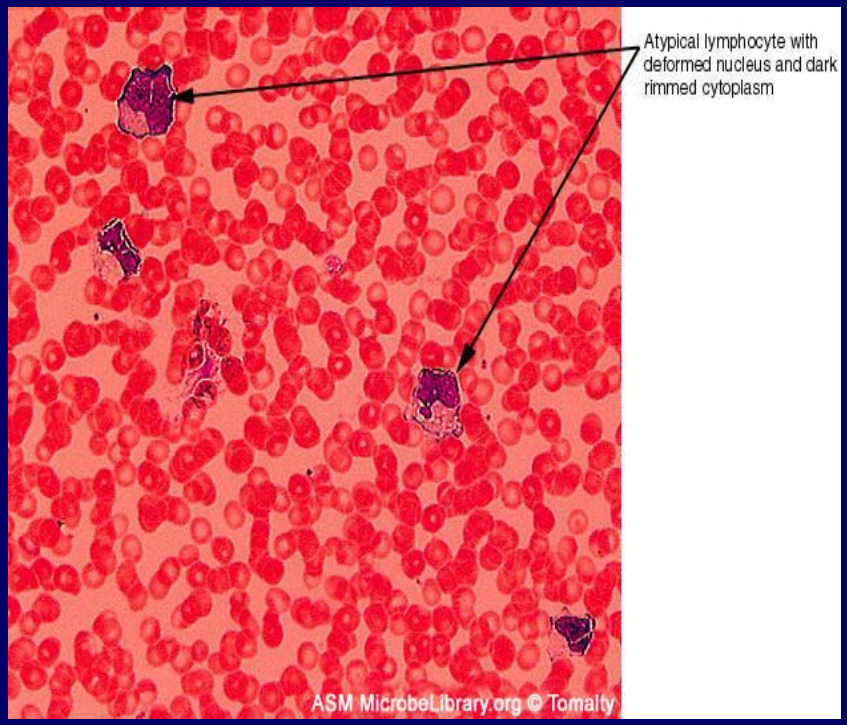
EBV

Hematology:

- ↑ WBC

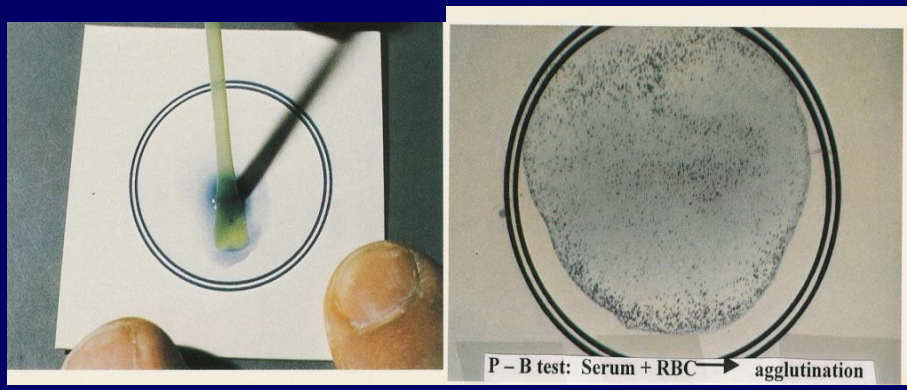
  lymphocytosis

  (Atypical lymphocytes)



Serology:

- Non-specific AB test ;
  - Heterophile Abs +ve
  - Paul-Bunnell or monospot test



- EBV-specific AB test:

  IgM Abs to EBV capsid antigen

EBV

Management:

- Treatment:
  - Antiviral drug is not effective in IMN
- Prevention:
  - No vaccine

Cytomegalovirus CMV

- Special features;
  - Its replication cycle is longer.
  - Infected cell enlarged with multinucleated.

    [cyto=cell, megalo=big]
  - Resistant to acyclovir.
  - Latent in monocyte, lymphocyte & other.

- Distribution: worldwide .
- Transmission;
  - Early in life:
    - Transplacental
    - Birth canal
    - Breast milk
  - Young children: saliva
  - Later in life: sexual contact, Blood transfusion & organ transplant.

Acquired Infection;

- Immunocompetent host
  - Asymptomatic
  - Self-limited illness
    - Hepatitis
    - Infectious mononucleosis like syndrome

      [Heterophile AB is –ve]

- Immunocompromised host
  - Encephalitis , Retinitis , Pneumonia ,
  - Hepatitis, Esophagitis, Colitis.

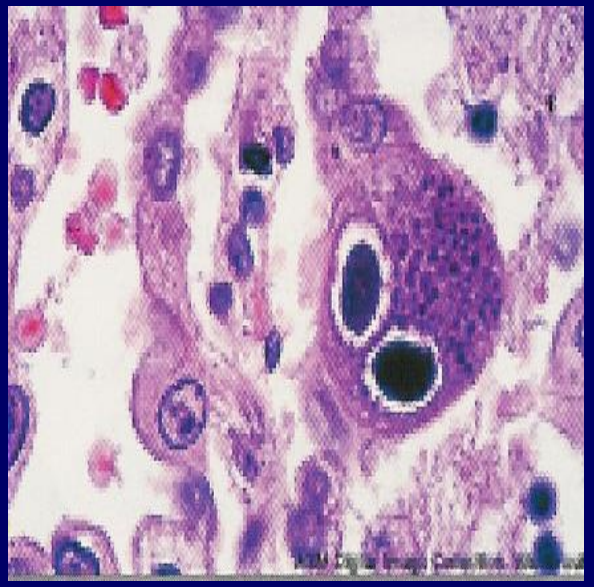
Congenital Infections

Lab Diagnosis

CMV

- Histology:

  Intranuclear inclusion bodies [Owl's eye]



- Culture:
  - In human fibroblast

    1-4 wks → CPE
  - Shell Vial Assay → 1-3 days

- Serology :
  - AB → IgM: current inf
    IgG: previous exposure
  - Ag → CMV pp65 Ag by IFA

- PCR

Treatment:

- ***Ganciclovir***

  is effective in the treatment of severe CMV inf.

- ***Foscarnet:*** the 2nd drug of choice .

Prevention:

- Screening;
  - Organ donors
  - Organ recipients
  - Blood donors
- Leukocyte-depleted blood.
- Prophylaxis: Ganciclovir, CMVIG.
- No vaccine.

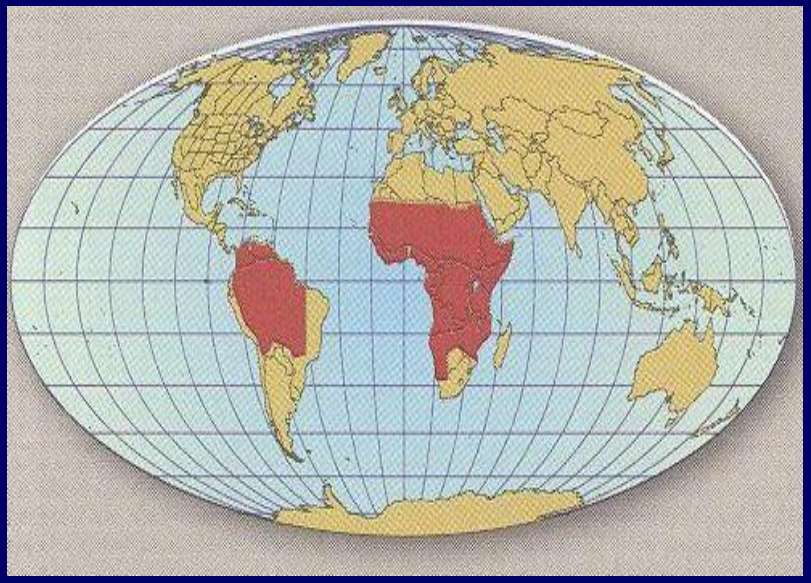
Arthropod –borne Viruses **(Arboviruses)**

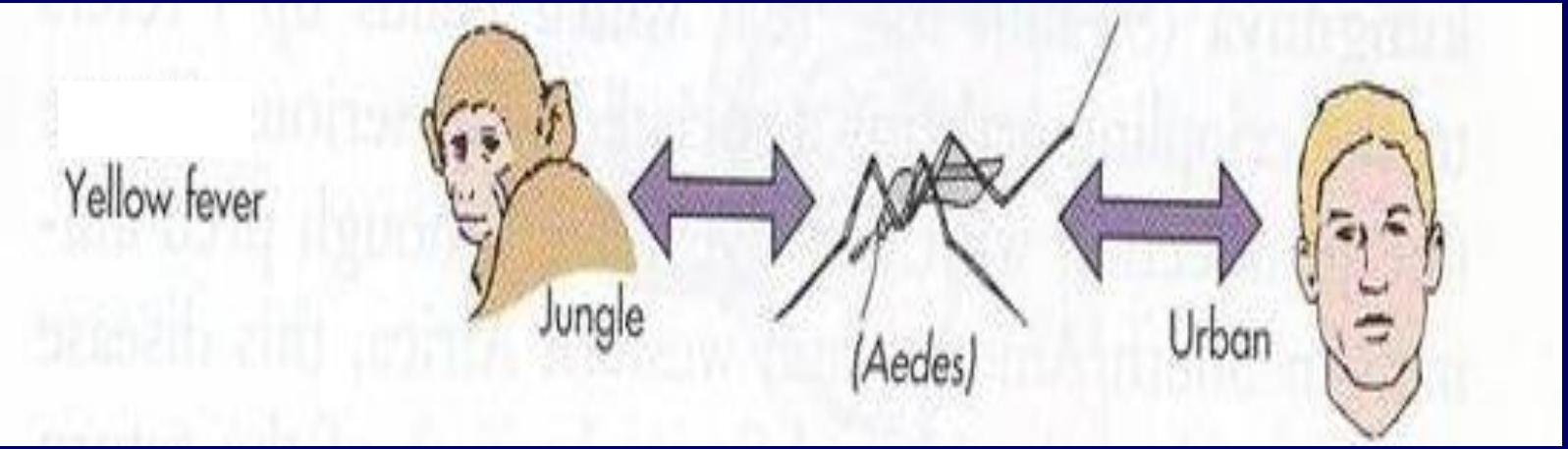
Yellow Fever virus

- Family: *Flaviviridae*
- Asymptomatic to Jaundice (hepatitis) + Fever ± hemorrhage ± renal failure
- Epidemiology

  Tropical Africa & South America

  1. Jungle Yellow Fever
  2. Urban Yellow Fever





Jungle Yellow Fever:

- Vector: mosquito
- Reservoir: monkeys
- Accidental host: humans
- It is a disease of monkeys

Urban Yellow Fever

- Vector: mosquito
- Reservoir: human
- It is a disease of humans

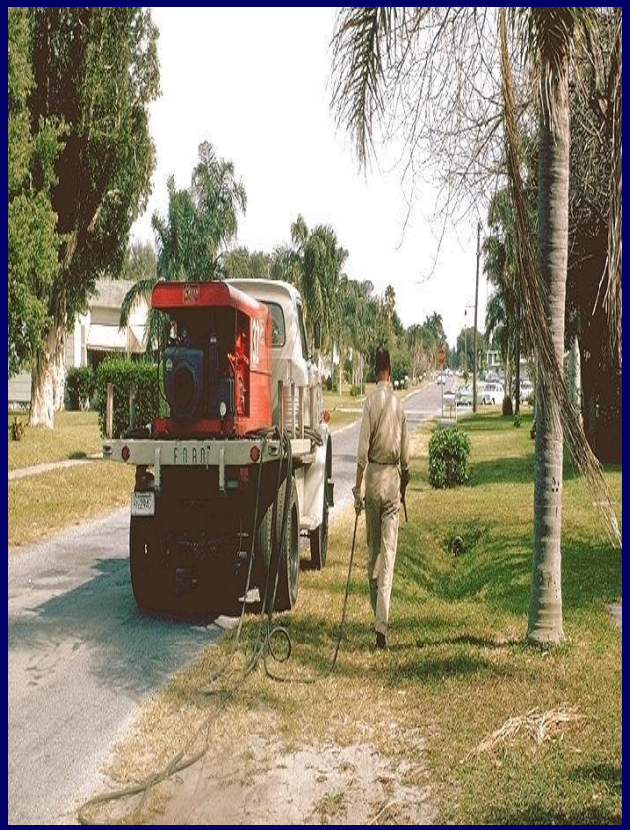
Diagnosis:

- Reference Lab
- Lab Methods:

A- Isolation (Gold standard)

B - IgM-Ab - ELISA, IF: (most used)

C - Arbovirus RNA by RT-PCR



Prevention:

1-Vector Control:

- Elimination of vector breading sites
- Using insecticides
- Avoidance contact with vectors

2-*Vaccines:*

Yellow Fever vaccine (LAV, one dose /10 yrs)

It is recommended for travelers.

Reference books

&the relevant page numbers

Medical Microbiology.

By: David Greenwood ,Richard Slack,
John Peutherer and Mike Barer.

17th Edition, 2007.

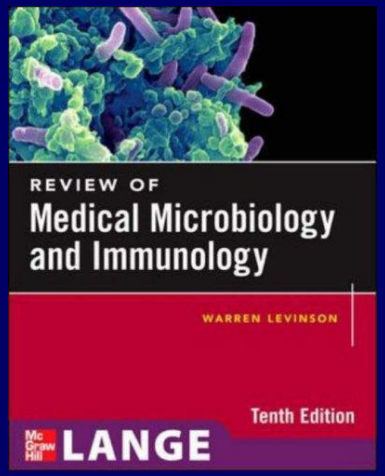
Pages; 428-435, 484-485, 507-523, 533-534.

Review of Medical Microbiology and Immunology.

By: Warren Levinson.

10th Edition, 2008.

Pages; 257-259, 292-294, 301, 305-306.



Thank you for your attention !