

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

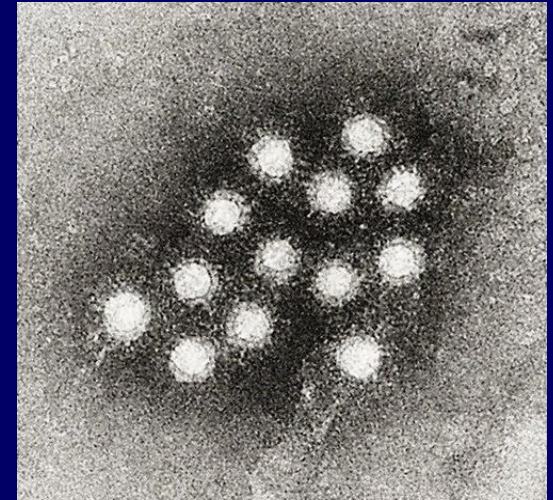
Family of *Picornaviridae*.

Genus: *Hepatovirus*.

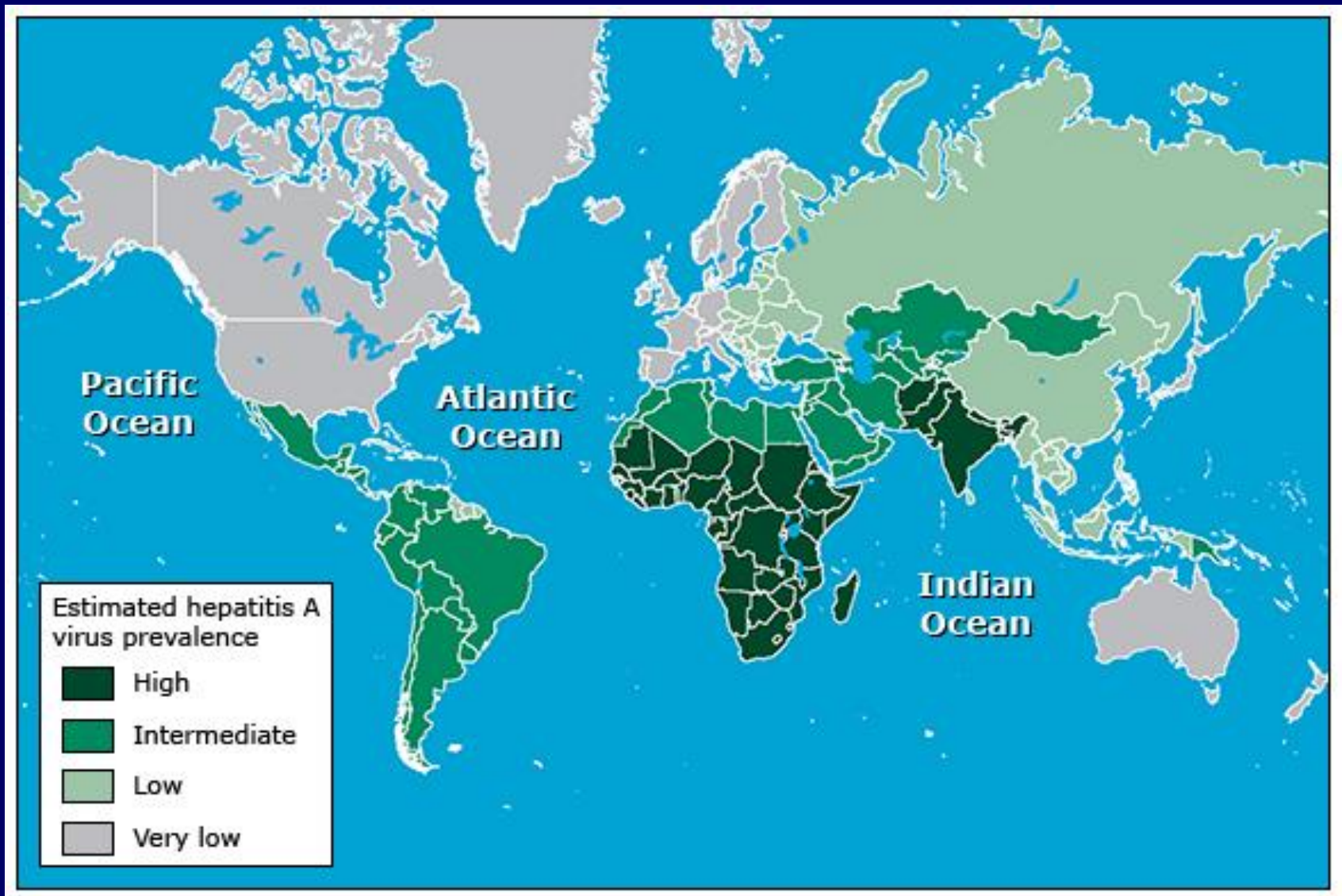
Virion non-enveloped and consist of:

- Icosahedral capsid.
- Positive sense ss-RNA.

- Short incubation hepatitis
- Infectious hepatitis
- Epidemic hepatitis



Geographic Distribution of HAV Infection



Epidemiology



🏠 Distribution:

- 🏠 Worldwide, endemic in tropical countries

🏠 Transmission:

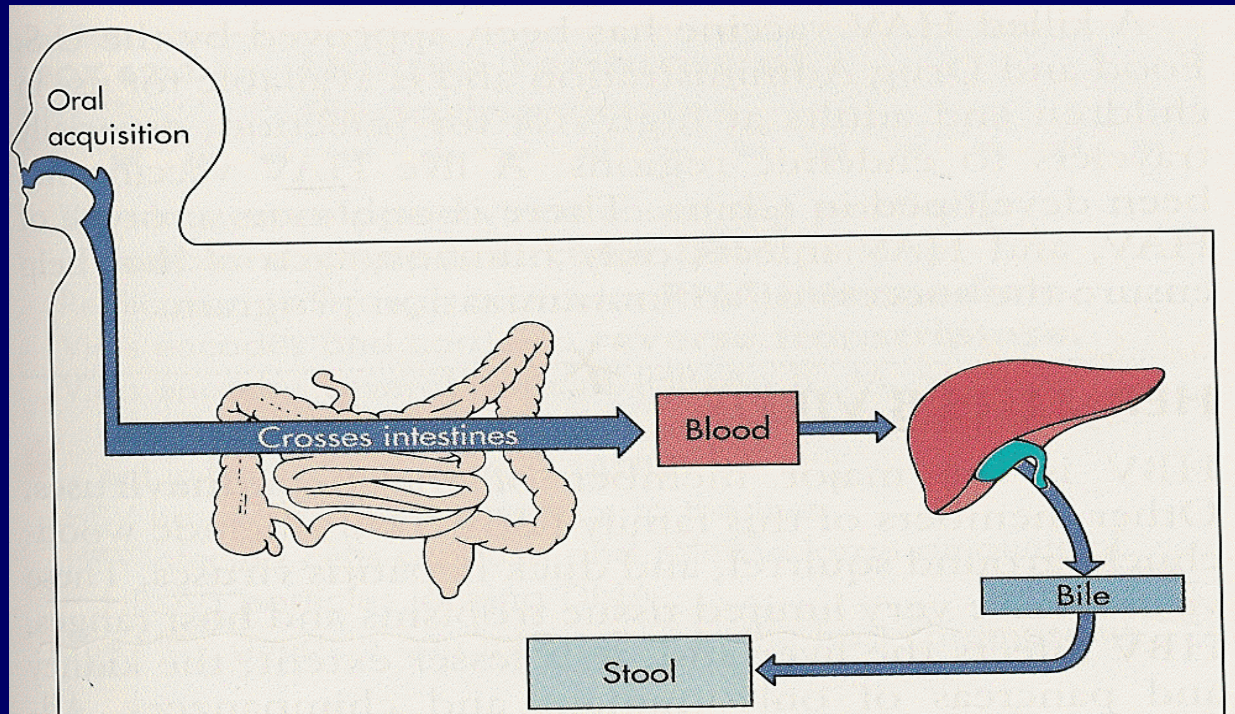
- 🏠 Faecal-oral route [major route]
 - Contaminated food & water
- 🏠 Sexual contact (homosexual men)
- 🏠 Blood transfusion (very rarely)

🏠 Age:

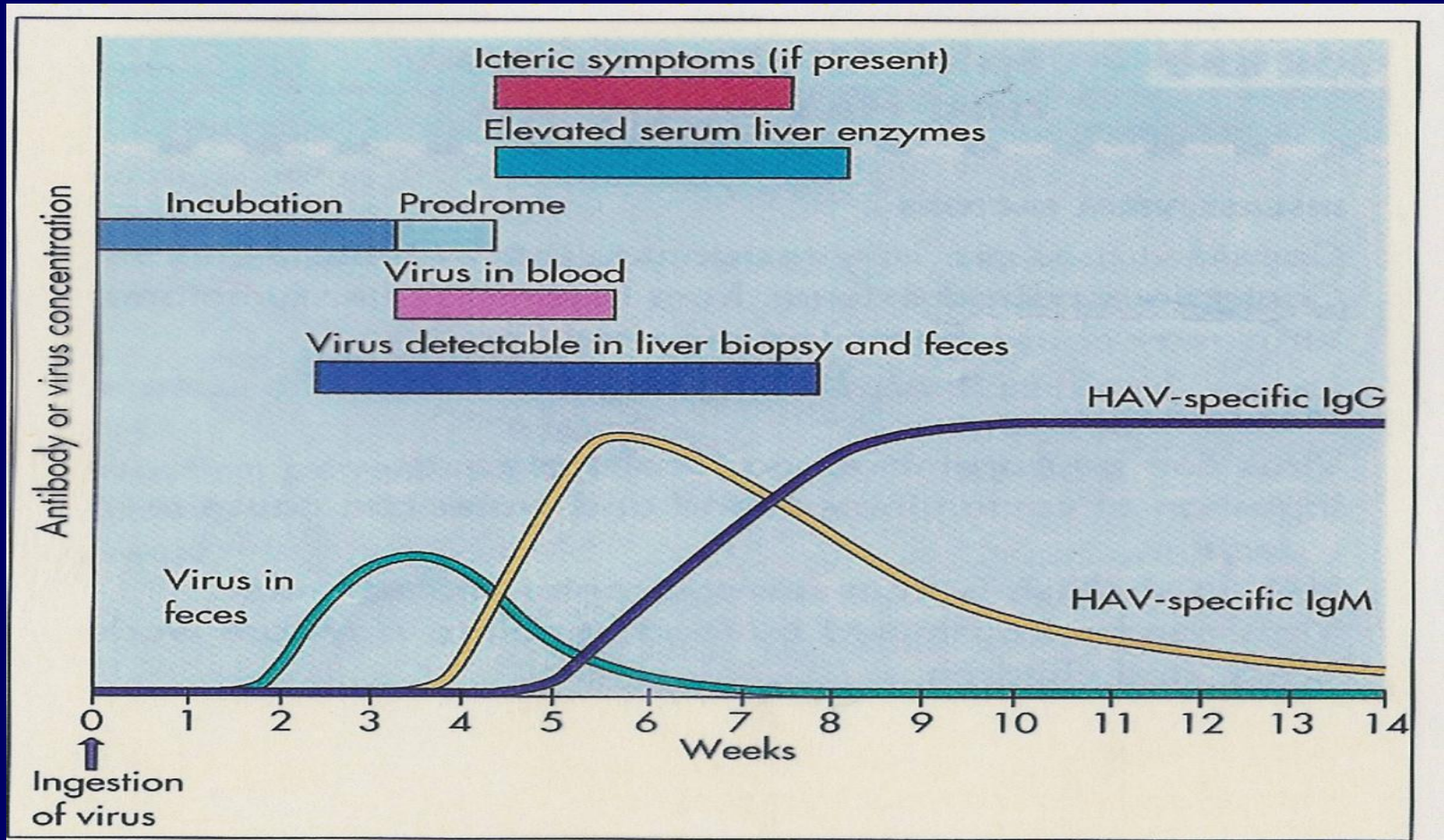
- 🏠 In developing countries; children
- 🏠 In developed countries; young adults

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



Manifestations



🏠 Hepatitis

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



Prognosis








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

Lab Diagnosis



Serology:

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

Management



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

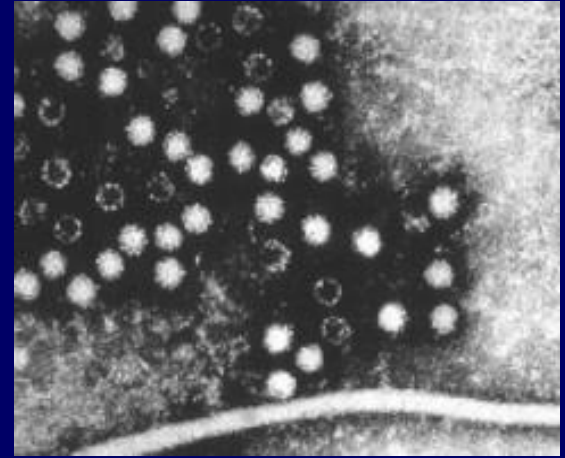
Characteristics of HEV

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:

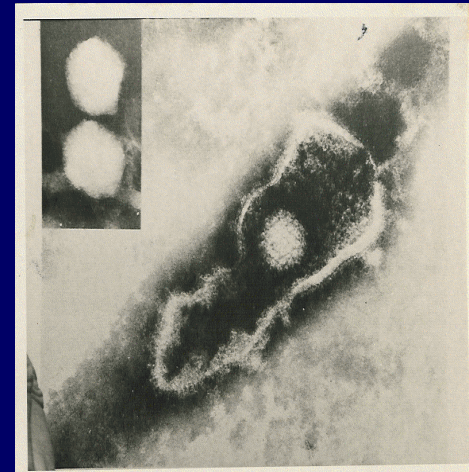
🏠 Sanitation & hygiene measures

🏠 No Immunoglobulin

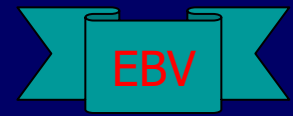
🏠 No vaccine

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

- 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:



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)



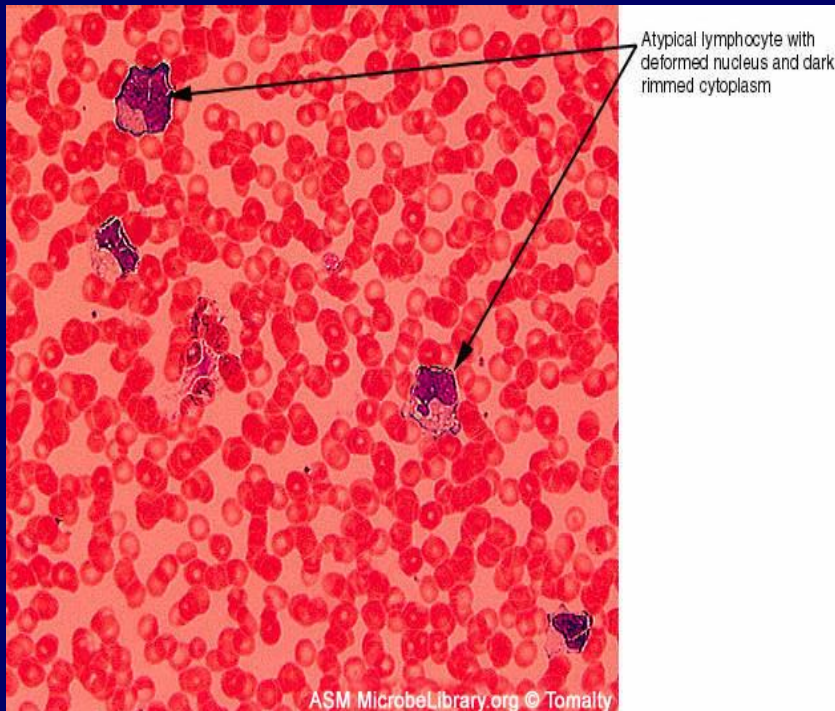
Diagnosis:



Hematology:

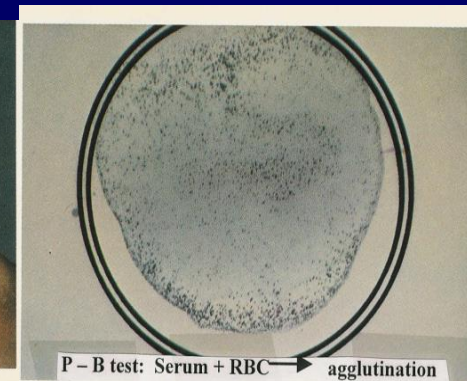
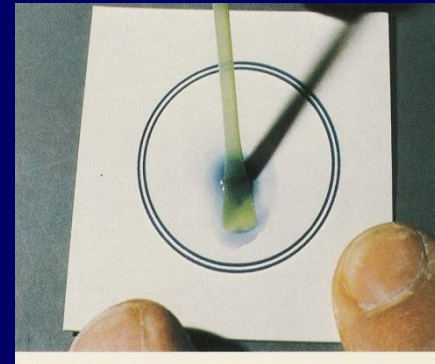
- ↑ WBC

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

Management:

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

Cytomegalovirus CMV

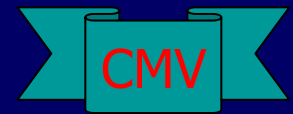
- Special features;
 - Its replication cycle is longer.
 - Infected cell enlarged with multinucleated.
[cyto=cell, megal=big]
 - Resistant to acyclovir.
 - Latent in monocyte, lymphocyte & other.
- Distribution: worldwide.
- Transmission;
 - Early in life:
 - Transplacental
 - Birth canal
 - Breast milk
 - 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.

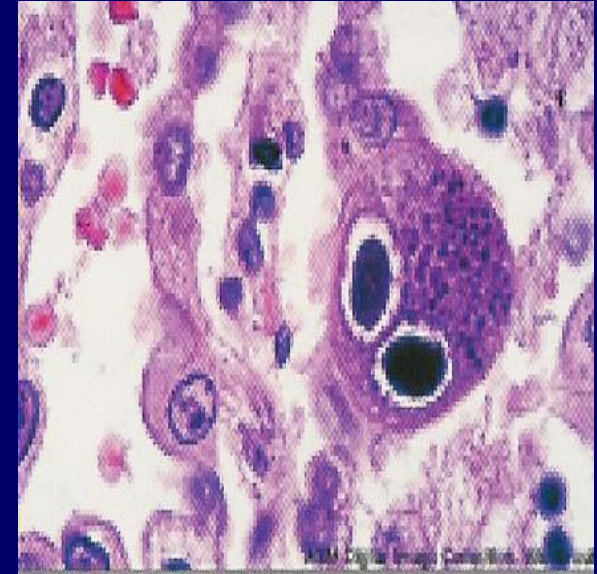
Congenital Infections

Lab Diagnosis



✦ **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)

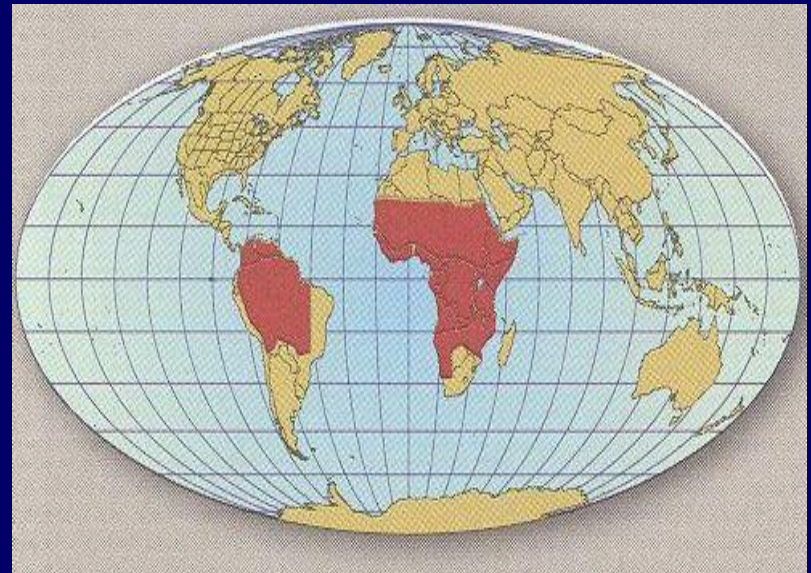
Yellow Fever virus

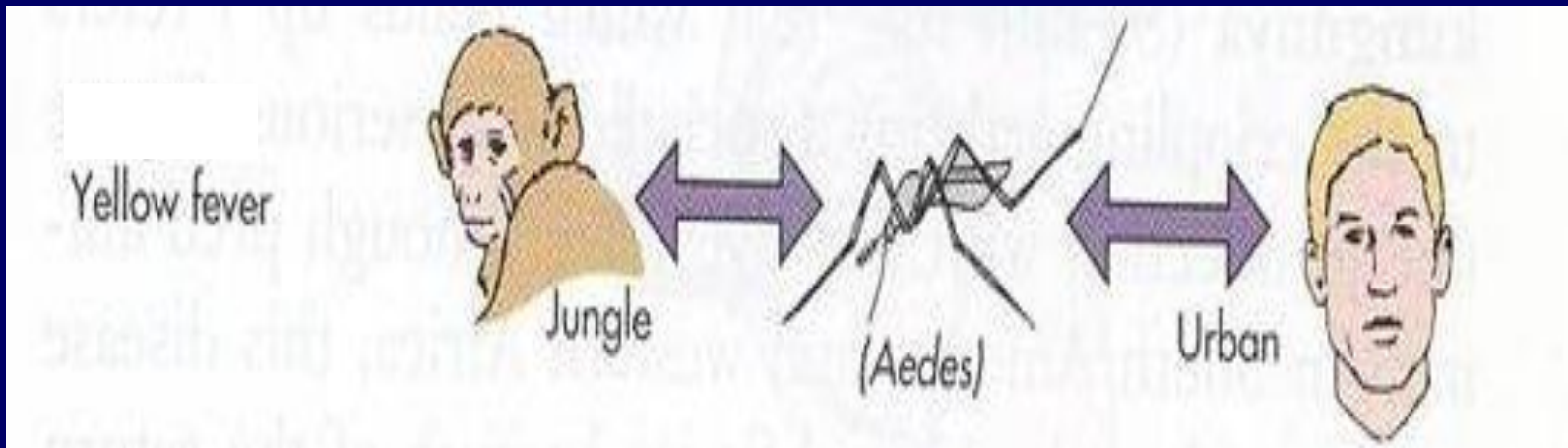
- Family: *Flaviviridae*
- Asymptomatic to Jaundice (hepatitis) + Fever ± hemorrhage ± renal failure

- 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:

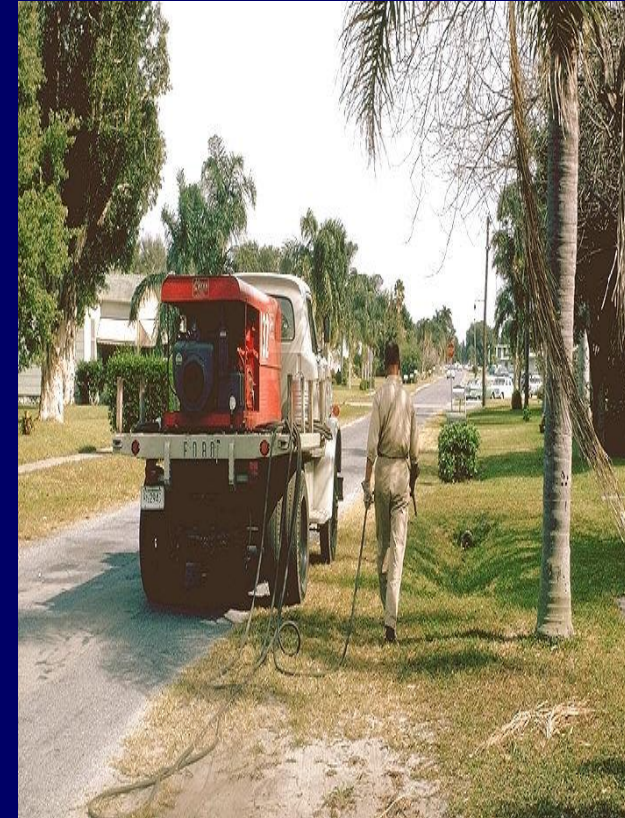
1-Vector Control:

- Elimination of vector breeding 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.

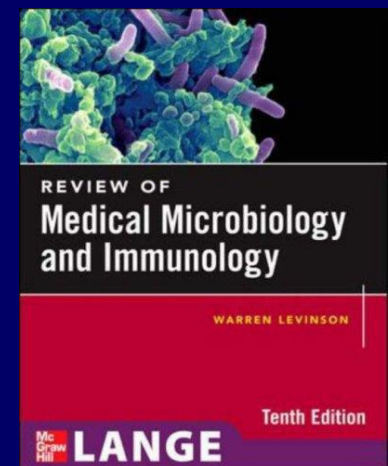


Review of Medical Microbiology and Immunology.

By: Warren Levinson.

10th Edition, 2008.

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



Thank you for your attention !