



# HEPATITIS

(GIT block , Microbiology: 2016)

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# *OBJECTIVES;*

- Know the classification of viruses causing hepatitis.
- viruses causing enterically transmitted hepatitis
  - HAV.
  - HEV.
- viruses that are causing hepatitis during their course of infection ;
  - e.g Cytomegalovirus (CMV)
  - Epstein-Barr virus (EBV)
  - Arbovirus (yellow fever virus )

# HEPATITIS

## Viral hepatitis

- As part of generalized infection  
(CMV, EBV, Yellow fever virus)
- Infect primarily the liver
  - Faecal-borne hepatitis (A & E)
  - Blood-borne hepatitis (B , C & D)

# FECAL-BORNE HEPATITIS

 HAV

 *Picornaviridae*

 HEV

 *Hepeviridae*

 *Nonenveloped*

 *Icosahedral*

 *ss, + sense RNA*

 *One serotype*

# *HEPATITIS A VIRUS*

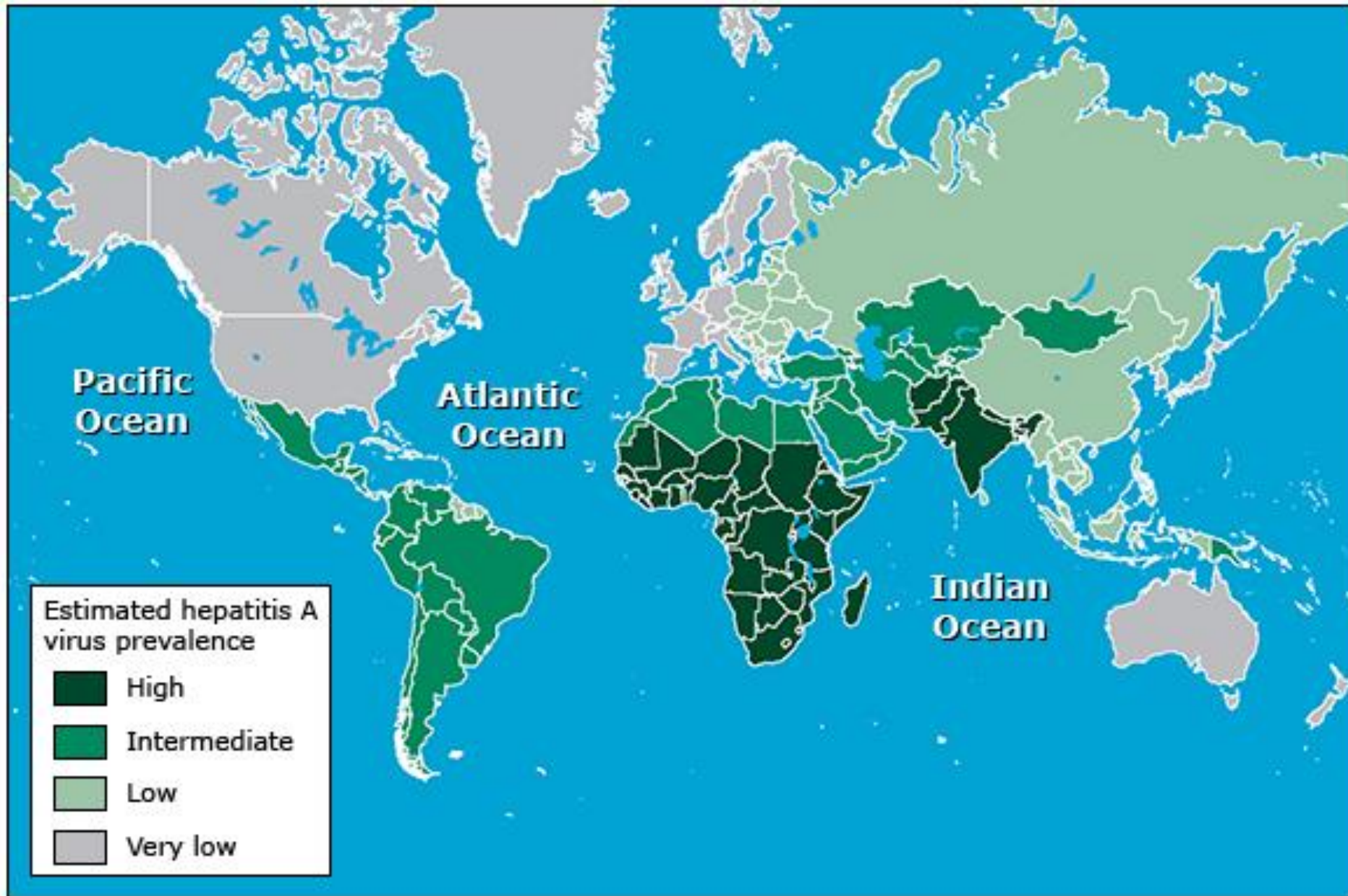
## Hepatitis A

Short incubation hepatitis

Infectious hepatitis

Epidemic hepatitis








## Distribution:

-  a worldwide, endemic in tropical countries

## Transmission:

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

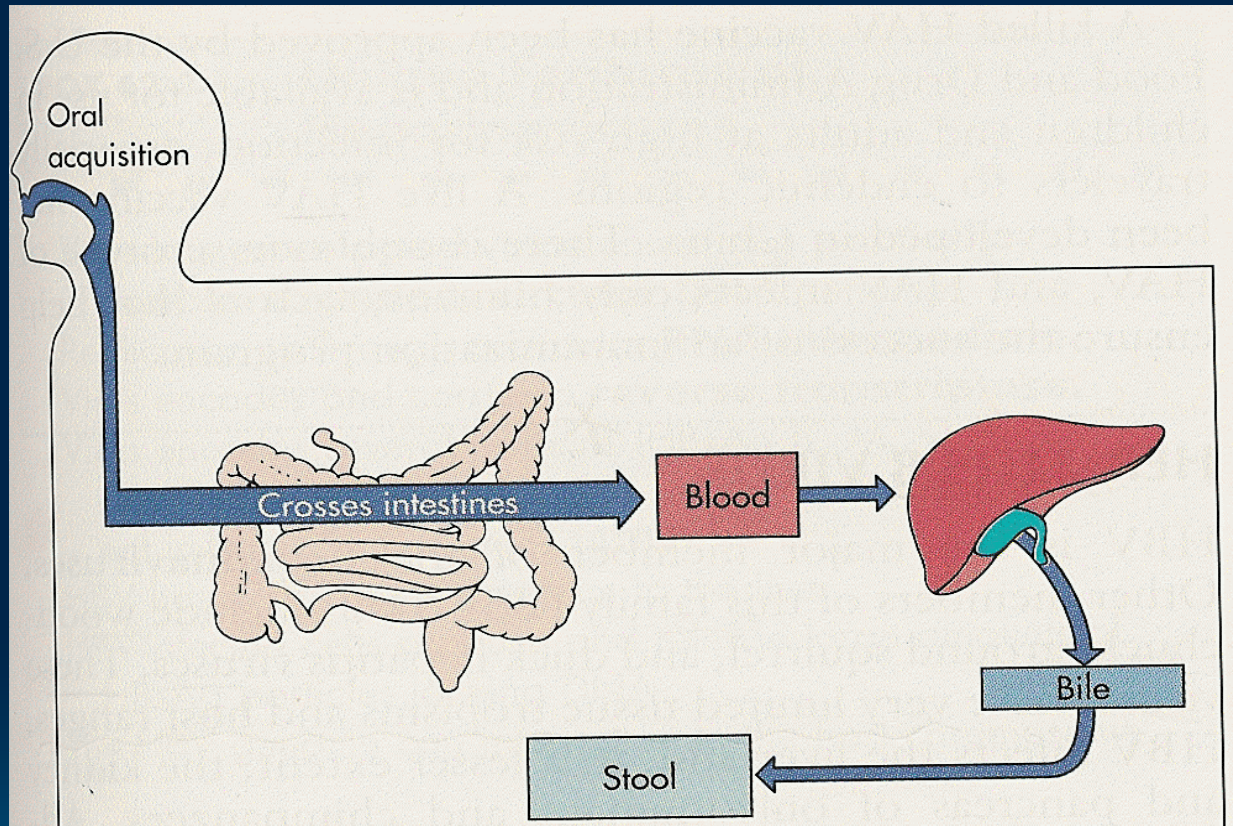
## Age:

-  In developing countries; children\*
-  In developed countries ; young adults



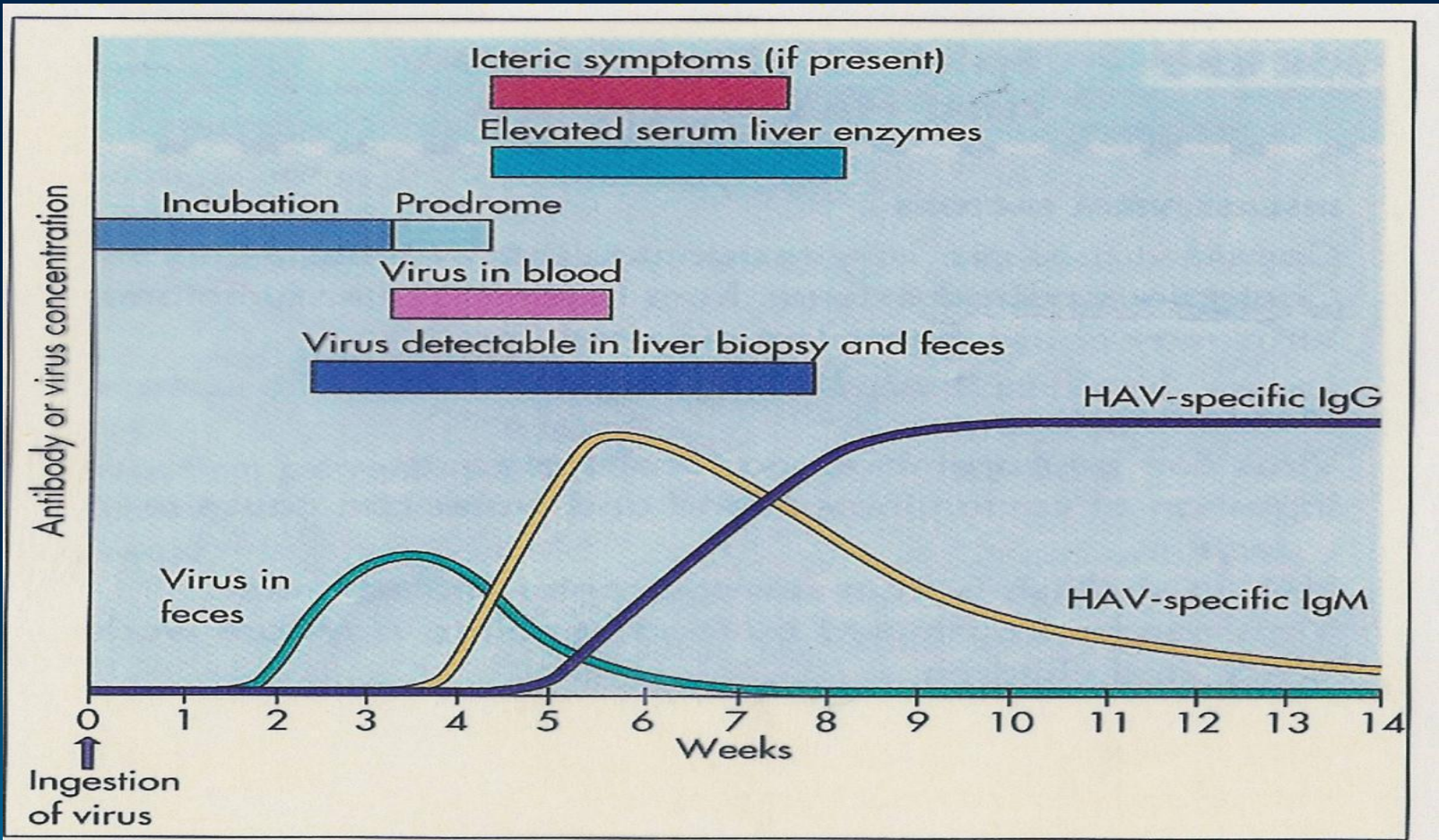
# Pathogenesis

HAV



- CMI → Damage of virus-infected hepatocyte
- →  ALT, AST & Bilirubin








# *Manifestations*



## Hepatitis





-  IP=2-6 Ws
-  Pre-icteric phase: fever, fatigue, N, V, & RUQP
-  Icteric phase: dark urine, pale stool, jaundice



-  Asymptomatic & anicteric inf → common
-  Symptomatic illness → ↑ age

# *Prognosis*



-  Self-limited disease
-  Fulminant hepatitis  $\longrightarrow$  rare
-  Mortality rate  $\sim$  0.1 - 0.3%
-  No chronicity or malignancy changes

# *Lab. Diagnosis*



## Serology:

 Anti-HAV IgM  Current inf

 Anti-HAV IgG  previous inf

 immunity




# *Management*



## Treatment:

-  Supportive therapy

## Prevention:

-  Sanitation & hygiene measures
-  Hlg
-  Vaccine





# *Prevention*



## **HIg:**

- Given before or within 2 Ws of exposure
- Indication : travelers  
unvaccinated , exposed p

# *Prevention*



## Vaccine:

 inactivated

 Given IM at [0,6-12 M]

 >1 Y of age

 S/E : mild local reaction

 Indication : P at high risk of inf

P at high risk of severe dis

 A combination vaccine (HAV & HBV)

# **HEPATITIS *E* VIRUS**

## **Hepeviridae**

## **Epidemiology:**

 outbreak of waterborne & sporadic cases of VH

 **Age;** young adults

 **4 routes of transmission;**

 Waterborne\*

 Zoonotic foodborne

 Bloodborne

 Perinatal

# **HEPATITIS E VIRUS**

## **Clinical features:**

 ~ HAV infection & exceptions:

 Longer IP =4-8 Ws

 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

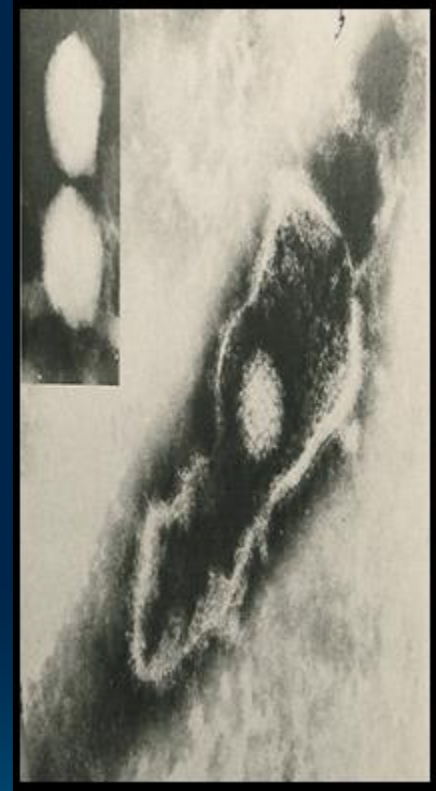
 No Ig

 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]
- Age:

Socio-economic status: SE

- Low SE class → early childhood
- High SE class → adolescence

# Clinical Features:

EBV

## 1-Immunocompetent host

- ❖ Asymptomatic
- ❖ Infectious mononucleosis [glandular fever]
  - Mainly in teenagers & young adults
  - IP = 4-7 weeks
  - Fever, pharyngitis, malaise, LAP, hepatosplenomegaly & abnormal LFT ± hepatitis .
  - Complications  
( acute air way obstruction, splenic rupture, CNS inf)
- ❖ Chronic EBV infection

## 2- Immunocompromised host

- Lymphoproliferative disease ( LD)

# Dx:

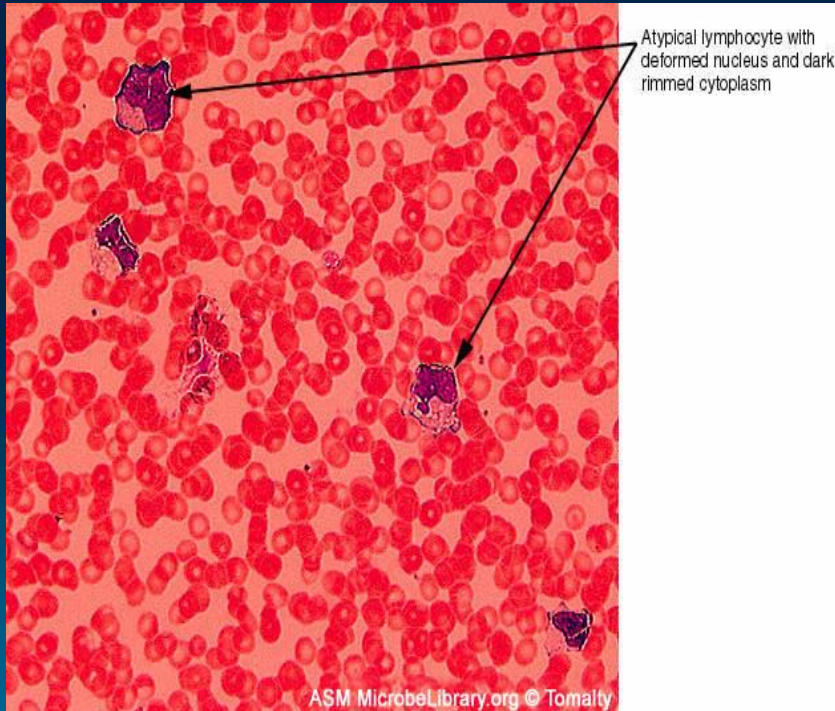
EBV

## Hematology:

- ↑ WBC

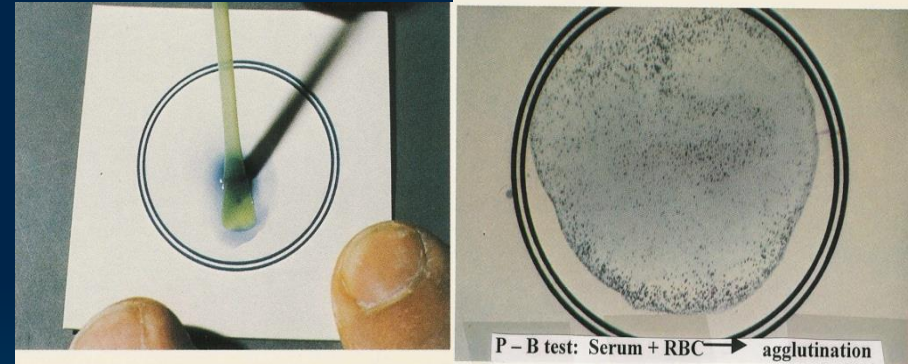
lymphocytosis

( Atypical lymphocytes )



## Serology:

- Non-specific AB test ;
  - Heterophile Abs +ve
  - Paul-Bunnell or mono-spot 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 ;
  - Infected cell enlarged with multinucleated .  
[cyto=cell, megallo=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 Infections;

- 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:

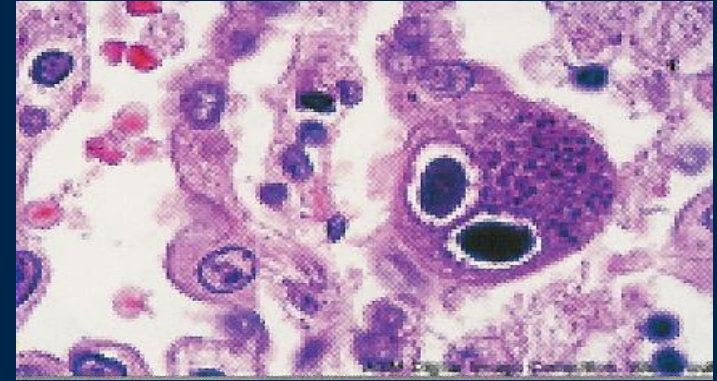
# Lab. Dx

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

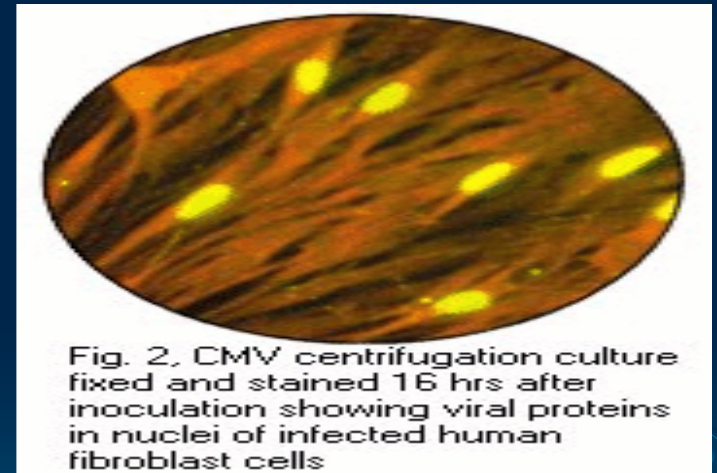


Fig. 2. CMV centrifugation culture fixed and stained 16 hrs after inoculation showing viral proteins in nuclei of infected human fibroblast cells

✦ PCR

## Rx.

### ■ *Ganciclovir*

is effective in the Rx 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)

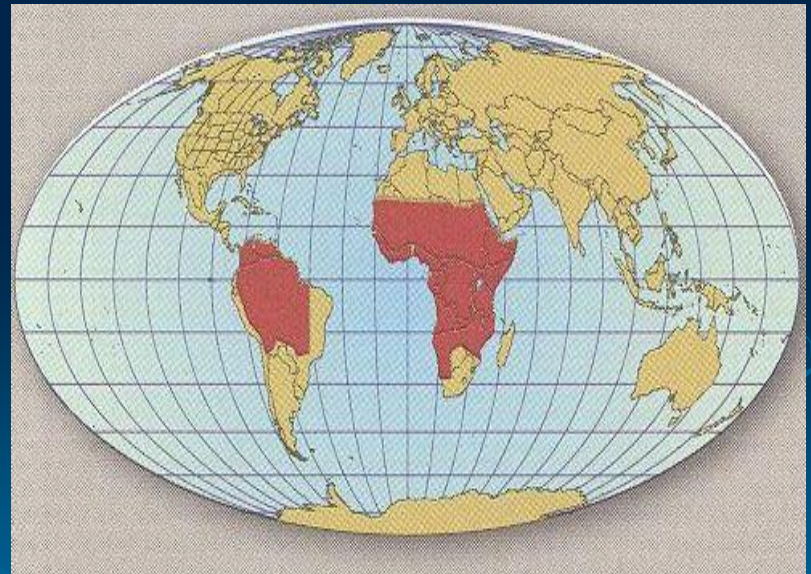
## Yellow Fever virus

- Flaviviridae
- Asymptomatic to Jaundice + Fever ±  
hemorrhage ± renal failure

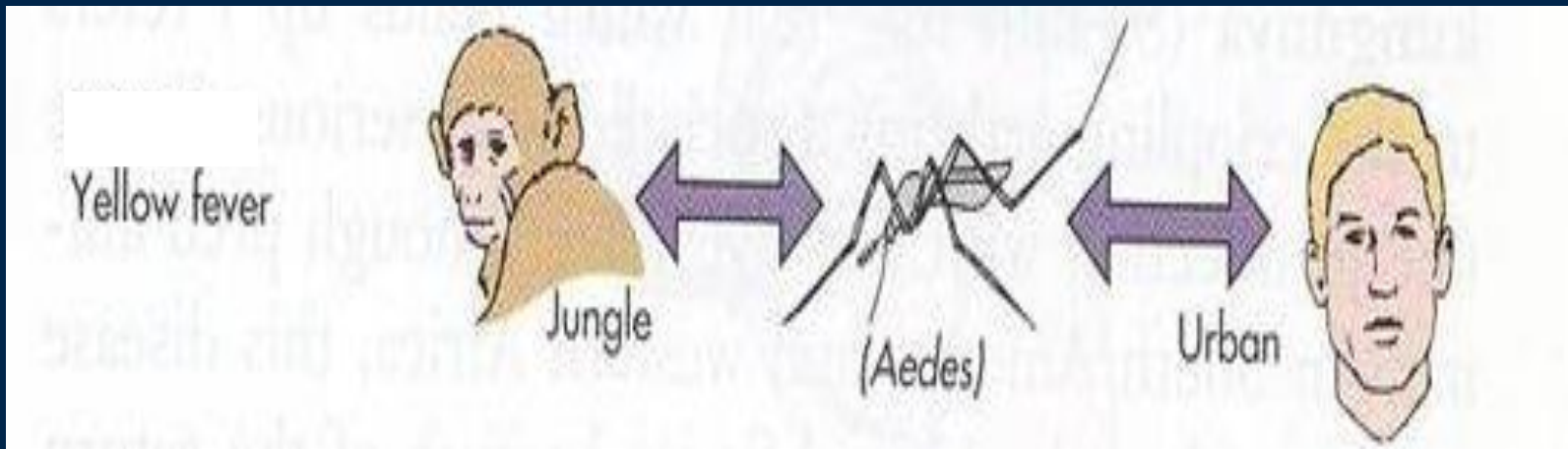
- Epidemiology

Tropical Africa  
& South America

1. Jungle Yellow Fever
2. Urban Yellow Fever







## Jungle Yellow Fever:

- Vector: mosquito
- Reservoir: **Monkey**
- Accidental host: **human**
- It is a disease of **Monkeys**

## Urban Yellow Fever:

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

# Dx.

- Reference Lab
- Lab. Methods :

A- Isolation

B - IgM -AB\* - ELISA, IF: (most used)

C – YFV- RNA by RT-PCR

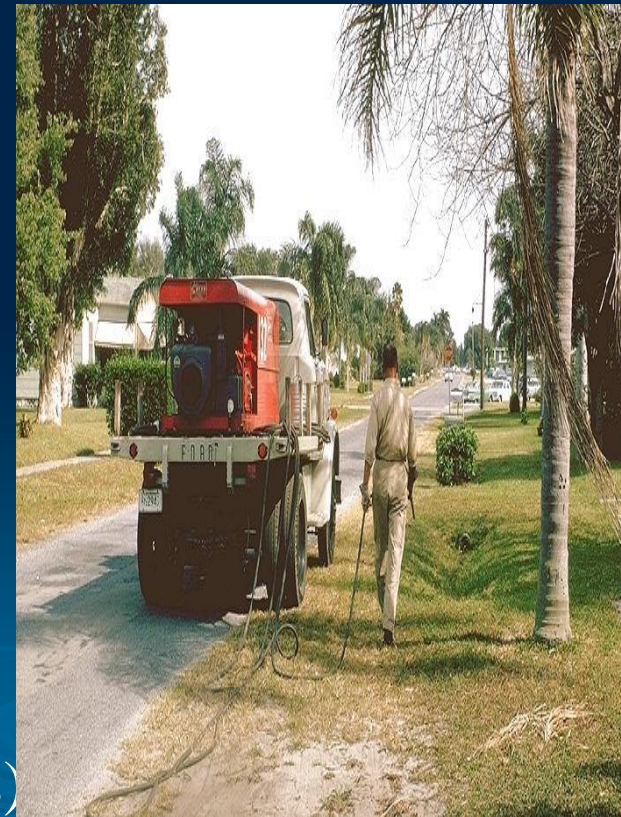
# Prevention

## *1-Vector Control:*

- Elimination of vector breeding sites
- using insecticides
- Avoidance contact with vectors  
( repellants , net )

## *2-Vaccines:*

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





## ليكن حجابك ✓

أختي المسلمة ... إذا كانت هذه الشروط تتوافر في ملابسك ...

- أن يكون ساتراً للبدن
- ألا يصف ولا يشف الجسم
- ألا يكون زينة في نفسه
- ألا يكون معطراً
- أن يكون فضفاضاً واسعاً غير ضيق
- ألا يشبه ملابس الرجال
- ألا يقصد به شهرة بين الناس

فاعلمي أن ...

## حجابك ✓

عباتي تاج على راسي  
صور تيجان

عباتي عبادة  
وليست  
عبادة



hadaeeq.ngeia.com

جمالي بالاسماني

# Reference books & the relevant page numbers

## *Medical Microbiology.*

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

17<sup>th</sup> Edition, 2007.

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

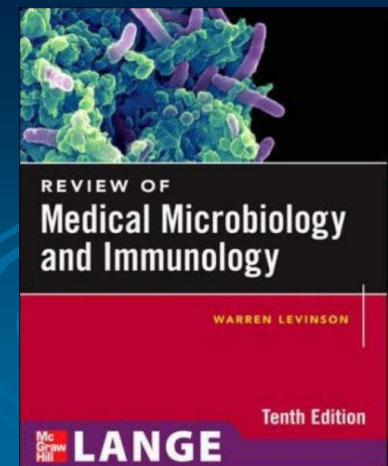


## *Review of Medical Microbiology and Immunology.*

By: Warren Levinson.

10<sup>th</sup> Edition, 2008.

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



*Thank you*

