॥ स्वास्थ्य-सेवा-सुशिक्षणम् ॥
MIMER MEDICAL COLLEGE

INFECTIVE HEPATITIS

Department of Pediatrics
MIMER Medical College
Talegaon Dabhade

HEPATITIS -A VIRUS

- **Structure-RNA virus, 27 nm in diameter, spherical , non enveloped,single antigen serotype.**
- **Incubation period- 14-50 days.**
- **Mode of transmission- Faeco-oral route, occasionaly parenteral.**
- **C/F-a) Prodromal phase- fatigue, muscle weakness, lack of appetite,diarrhoea, vomiting, headache, fever with chills, rashes, joint pain.**

  b) Icteric phase – Icterus accompinied by anorexia , low grade fever, pruritus, enlarged tender liver, increased LFTs.

  c) Recovery –
- **Complications -1) Fulminant hepatitis**

  2) Relapsing hepatitis A

  3) Cholestasis jaundice
- **Treatment – No specific treatment**

  - Supportive treatment

  - Silymarine – claims to decrease prodrome , decrease severity
- **However long term multicentric double blind placebo controlled trials are required to substantiate it's efficacy.**

DISEASE PATTERN & EPIDEMIOLOGY

- **HAV – Enterically transmitted.prevalance closely related to the level of economic development & environment.**
- **Areas of endemicity – 1) High (30-100 cases / 1 lakh/yr)**
  2) Intermediate (20- 30)
  3) Low (0-15)
- **Epidemics do not occur in – 1) Hyperendemic areas : most immune by 10-15 yrs.**

  2) Low endemicity areas –strict control measures.

  Intermediate endemicity areas: disease largely occrs in childhood.
- **Recent trends in HAV infection- Better environ.sanitation-infection in older age group- increased incidence of severe clinical disease & mortality.**
- **Trends in India – 1) Prevalance of antibody titres minimum in the age group 13-18 months- d/t weaning of mat. Ab.**
  2) Seropositivity in lower socioeconomic groups :83-96 %,higher income groups: 64-85 %.Increased susceptibles in affluent sections.
  3) Positivity of cord blood samples has declined from 100 % to 60% (1998) – Mittal et al.

HEPATITIS – A VACCINE

- **Two inactivated vaccines are available –**
  1) HAVRIX 2) VAQTA (From CR 326 F viral strain , not available in IND)
- **HAVRIX – Inactivated HM 175 strain HAV (Formalin inactivated)**
- **Indications : (In industrialized countries)**

1. **Travelers from industrialized country to a developing country.**
2. **Communities in inner city with high outbreak rates.**
3. **Family members & close contact of HAV pt.**
4. **Pts with chronic liver disease.**
5. **Homosexuals**
6. **Intravenous drug abusers**
7. **Health care workers & staff of NICU.**
8. **All medical service personnel .**
9. **Food handlers**
10. **Exposure too non human primates.**

- **Dose – 0.5 ml-360 units, 1.0 ml- 720 units.**
- **Inactivated HM 175 adsorbed on 0.5 micro gm alum. Hydroxide.**

- **Administration –IM (Deltoid)**
- **Dosage – 1) Primary course – 2 doses one month apart**

  2) Booster dose – 1 dose betn 6-12 months after 1st dose of the pri. Course.
- **Contraindication – 1) Acute severe febrile illness**

  2) Known hypersensitivity
- **S/E – Local pain for 1 day (d/t al. hydroxide), Fatigue, malaise , headache.**
- **Pregnancy & Lactation – Inactivated viral vaccine – negligible risk to fetus . Effects on breastfeed infants has not yet studied ,should be used cautiously in breastfeeding women.**

- Efficacy –

Interval after 1st dose	**Seroconversion**	**Mean Anti HAV levels**
Schedule 0,1,2 months		**(Milli IU / ml)**
1 mnth	**95.7 %**	**304**
2 mnth	**99.8 %**	**517**
3 mnth	**100 %**	**1454**
6 mnth	**100 %**	**796**
7 mnth	**100 %**	**543**
Schedule 0,1,6 mnth		
7 mnth	**100 %**	**4114**
Schedule 0,1,12 month		
13 mnth	**100 %**	**9051**

- **Delaying booster dose increases Ab levels.**
- **Immunoglobulins & Hep. A Prevention:**

- Specific pooled Ig

- 0.06 ml/kg both for pre & post expo. Prophylaxis, provided it is administered within 2 wks of expo.

- Temporary but immediate protection.

- Immunity for 4-6 mnth

- Pre exposure Prophylaxis –

  1) Single unplanned visit to unplanned area.

  - Ig – 0.06 ml/kg –Protection up to 5 mnth

  2) Sudden prolonged travel -1st dose of HA vaccine 1 mnth before dept.

- Post exposure Prophylaxis –

  - Ig within 2 wks of expo. Gives immediate protection

  - Double dose HA vaccine – Protective Ab titres in 90% individuals after 15 days & about 100% at 4 wks .(Further studies required to substantiate these findings to ensure safety of such high doses)

Current status of HEP-A vaccine in India

" DO WE NEED IT "

- **By 10-15 yrs of age almost all children develop protective Ab , largely d/t subclinical infection.**
- **Only when subclinical infection wanes , a sizeable proportion of adults emerge unapposed to HAV with risk of severe illness & higher fatalities. Till such time incorporating HA vaccine in the immunisation schedule for a healthy children may not be worthwhile in view of the economic constraints of a developing country like India.**
- **Small proportion of children from affluent sections – probably unrespond to HAV – prudent to get HAV Ab titres prior to vaccination –offer vaccine only to seronegative individuals.**
- **Patients with HIV infection / Chronic liver disease – should be vaccinated to avoid severe disease.**

INFECTIVE HEPATITIS

- **Hepatotropic Viruses – A, B, C, D, E.**
- **Other viruses – Herpes simplex, EBV , CMV , Varicella , HIV , adenovirus , enterovirus, arbovirus.**
- **A, C , D, E - RNA viruses.**
- **B – DNA virus**
- **B,C,D- chronic infection, parenteral.**
- **A,E – No chronicity, water / food borne.**
- **D – Occurs only when active Hep A inf present.**

HEPATITIS - A

- **Aetiology -27 nm, RNA, Picornavirus.**
- **Epidemiology – Developing countries, 100% infected by % yr of age, Causes acute inf only person-person contact, faeco-oral. In adults illness more severe & symptomatic. < 5 yr illness asymptomatic / mild.**
- **Mean incubation period – 4 wk (15 d- 40 d)**
- **Infection during pregnancy or at the time of delivery does not appear to result in complications of pregnancy or disease in neonate.**

- **Pathology –Necrosis more in centrilobular areas.**

  - Increased cellularity in portal tract areas.

  - Diffuse mononuclear cell infiltrate

  - Diffuse Kuffer cell hyperplasia.

  - Lobular architecture remains intact.
- **Neonates - giant cell hepatitis.**
- **Fulminant hepatitis – Total destruction of parenchyma.**
- **Other organs affected – Lymphadenopathy, spleenomegaly, bone marrow- hypoplastic/ aplastic, ulceration in GIT,pancreatitis, myocarditis,skin rarely**.

- **Pathogenesis – Cytopathic injury.**

  Damage evident by-

1. **Increased ALT, increased AST , increased LDH. Height of elevation does not correlate with extent of hepatic damage & has little prognostic value.**
2. **Cholestatic jaundice – Increased Bilurubin D & ID. Obstruction to bile flow & hepatocyte injury.Increased SAP , increased 5-nucleotidase, gamma glutamyl transpeptidase & urobilinogen all reflect injury to billiary system.**
3. **Abnormal protein synthesis – increased PT, Decreased S. Alb.**

- **C/F- Abrupt onset.**

1) **Prodrome – Fever, malaise, nausea, emesis, anorexia, abdominal discomfort, diarrhoea (children), constipation (adults)**
2) **Njaundice , dark coloured urine, Rt, hypochondric pain.**
3) **Duration < 1 mnth, but relapsing course can occur several months. Complication- rarely fulminant Hepatic coma.**
4) **Recover completely.**

- **Diagnosis –H/o jaundice in contacts - Anti HAV IgM**
  - 3-12 mnth persists for life.

  IgG – Latter
- **Virus excreated in stools from 2 wk beforebton1 wk after onset of illness.**
- **Prolonged PT is a serious sign mandatory hospatalisation.**
- **Prevention-**

1) **Vaccine – Formalin killed , immunogenic. Indicated in industrialised countries of high risk children.-Can become carriers infect elders in whom disease can be severe .Unexposed travelers visiting endemic area.**
2) **Enteric precautions –Hand washing.HAV contagious for 1 wk after onset of jaundice.**
3) **Pooled Ig - Effective when given early in incubation period.**
   - No use if > 2 wk after exposuere.
   - Susceptible individuals – endemic.
   - Unimmumised household contacts
   - Mass adm to school children- epidemics
   - Child care centre , not toilet trained given to all children & prrsonnel.