Dr. Muhammad Zahoor ul Haq
Tuberculous Meningitis

-Most serious and fatal without effective treatment
Pathogenesis:

- Lymphohematogenenous spread from primary infection

- Subcortical metastatic caseous lesion (Rich’s focus)

- Discharges Tubercle bacilli into subarachnoid space
- Gelatinous exudate infiltrates corticomeningeal vessels producing primary infection

- Infarction of cerebral cortex

- Brainstem involvement-Cranial nerve palsies. III, IV, VII

- Communicating Hydrocephalus
Clinical Features

- 0.3% of untreated primary infections
- Age: 6 months – 4 years
- Onset: Commonly insidious

*1st Stage:
- Nonspecific symptoms
- Fever, Headache, Irritability
- Loss of interest in play
- Lasts from 1-3 weeks
2\textsuperscript{nd} Stage:

- Signs of meningeal irritation
- Focal neurological signs
- Seizures
- Hypertonia
- Vomiting & fever
- Signs of Hydrocephalus
- Papilledema
3rd Stage:

- Stage of coma / unconsciousness
- Hemiplegia
- Paraplegia
- Hypertension
- Decerebrate posturing
- Deterioration of vital signs
- Death
Diagnosis:

- High index of suspicion
- History of contact with Tuberculosis
- ESR
- X-ray chest
- Lumbar puncture
CSF:
- Cell count: increased (lymphocytes)
-Antibodies: increased
-Sugar: decreased
-Proteins: increased
-ZN stain
-Culture for AFB
Mantoux test

**BCG** (5mm induration on day III)

**Gastric lavage** for AFB

**CT Scan Brain**
Treatment:

A-Specific -

- Start with 4 drugs (12 months)

- 1- Rifampicin 10-20 mg/kg
- 2- INH 10-20 mg/kg
- 3- Pyrazinamide 30 mg/kg
- 4- Streptomycin 20-30 mg/kg
B- General:

- Prednisolone 2 mg/kg/day (4-6 weeks)
- Phenobarbitone 5 mg/kg/day
- Mannitol 20% 10 ml/kg
- Feeding by N/G tube
Complications:

- Cranial nerve palsies
  - 3rd, 6th, 7th,
- Optic atrophy (Blindness)
- Deafness
- Hydrocephalus
- Hemiplegia
- Epilepsy
- Mental retardation
- Diabetes insipidus
- Tuberculoma
Prognosis:

Depends upon

1- Age of Patients
2- Stage of disease

Stage 1: 100% cure
Stage 2:
Stage 3: 30-50% mortality

75 % of survivors have neurologic sequelae

Without treatment invariably fatal
Neonate of Tuberculous Mother:

- Possible routes of infection:

1- **Transplacental:**
   Primary infection in liver or lungs through ductus venosus

2- **Aspirate of infected amniotic fluid:**
   Lungs are involved

3- **Ingestion:**
   Liver
High Risk Pregnant Mother:

Tuberculin skin test:
- Positive: Chest X-ray
  (shielding)
- Negative: Clinically well
  no treatment

- Asymptomatic Tuberculous Infection:
  Treatment deferred until delivery

- Active Tuberculosis:
  always treat
  INH, Rifampicin, Ethambutol
  Avoid (Streptomycin, Pyrizinamide, Ethionamide)
Suspected Tuberculous:
  - Donot separate the infant!
  - X-ray chest of mother

**Abnormal:**
  - Through evaluation
  - History
  - Physical Examination
  - Sputum for AFB & C/S

**Evidence of current TB:**
  INH treatment for infant negative sputum (3m)
  - At 3 month: mantoux test & X-ray chest
Positive (>5mm)

full investigations.

-ve investigations
INH, Rifampicin for 3 months
Or INH for 9-12 months
+ve investigations Full Treatment

Negative: Discontinue INH, Give BCG
Perinatal (Congenital) Tuberculosis:
- Presents by 2\textsuperscript{nd} or 3\textsuperscript{rd} week
- Similar to sepsis / other congenital infections
- Respiratory distress
- Poor feeding
- Lethargic, irritability
- Hepatosplemomegaly
- Lymphadenopathy
- Abdominal distension
- Failure to thrive
- Skin lesion
- Manifestations vary with site & size of caseous lesions
- Meningitis in 30-50% cases
**Diagnosis:**

- Suspect if response to a antibiotic & supportive therapy is poor

- Maternal & family history of TB

- Mantoux test (negative initially)

- Early morning Gastric lavage for AFB

- X-ray chest Miliary, hilar lamphadenopathy
- Direct acid fast stain on
- Middle ear discharge
- Tracheal aspirate
- Bone marrow
- Biopsy film (liver, lymph node)
- CSF examination & culture
- Palatal examination if possible
BCG Vaccination:
- Attenuated bovine strain
- Bacillus Calmette Guerin (BCG)
- Introduced in France 1921 orally!
- First used in Sweden 1927 England 1948
- **Dose:** 0.05 ml at birth
  0.1 ml over one year of age
- **Route:** Intradermal
  Right shoulder,
  Wheel of 5-7 mm
Prevaccine Tuberculin test

. **Normal Reaction:**
  2 weeks - red tender swelling
  4 weeks – abscess / ulceration
  6-8 weeks - scar formation
  (Tell mothers about the response)
  Donot apply any medicine

. **Accelerated BCG Reaction:**
  > 5mm papule by day III
  indicates evidence of Tuberculosis
Complications:
- Abscess
- Large ulcer
- Lymphadenitis
usually due to large dose / subcutaneous injection

Efficacy:
- 50% effective in preventing pulmonary TB
- 50-80% effective in preventing TBM
Tuberculin Skin Test
( Mantoux Test)
- **Dose**: 0.1 ml (5 T.U. Of PPD)
- **Route**: Intradermal
  (1.0 ml syringe with 25-27 gauge needle)
- **Measure induration** (not Erythema) after 72 hrs
- **Positive**: > 10 mm
  5-9 mm
- **Negative**: < 5 mm
- **Multipuncture tests** (sclerov) not as accurate as Mx
False Negative:
- Poor technique / misreading
- 6-10 weeks after infection
- Very young age < 6 weeks of age
- Malnutrition
- Immunosuppression, Steroids
- Viral infections

- (Measles, Mumps, Rubella)

- Measles Immunization 6 wks

- Overwhelming TB

- (TBM, Miliary)

- 10-50% donot react initially
False Positive:

- Cross sensitization
- BCG
Thank You