BACTERIAL MENINGITIS :-

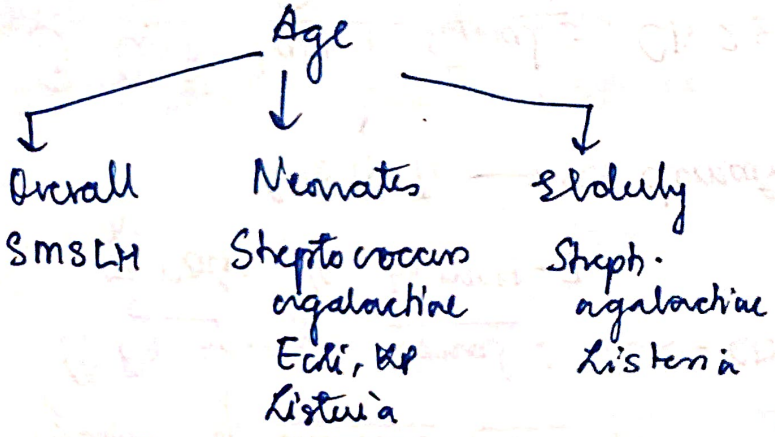
clo - fever, neck rigidity, signs of meningeal irritation
vomiting

Sin etiological agents implicated :-

1. Streptococcus pneumoniae (~50-1.)
2. Streptococcus agalactiae (~15-1.)
3. Listeria (~10 %.)
4. Meningococcus (25-1.)
5. Hemophilus influenzae (<10-1.)

S > M > S > L > H

6. Ecoli & Klebsiella (Neonates)



- Pathogenesis

Transmitted by - droplets of resp. secretions, close & prolonged contact - kissing, sneezing coughing on, someone, living in close contact

- Route of Infection -

1) Hematogenous - entry into subarachnoid space through choroid plexus.
2.) Direct spread from infected site - otitis med Sinusitis, mastoiditis
3.) Anatomical defect in CNS - surgery, trauma, congenital defect

Predisposing factors -

1.) Age - Age - neonates
2.) Vaccination
3.) factors that promote infection - alcoholism, DM, immunosuppression, splenectomy.
4.) Presence of CSF shunts
5.) Breach in BBB

C/M - IP: 4days (2-10days)

Signs of meningism -

1) Nuchal rigidity - neck resists passive flexion.

2) Kernig's sign - severe stiffness of hamstrings. causes inability to straighten leg when hip is flexed to 90°.

3.) Brudzinski's sign :- when neck is passively flexed, results in spontaneous flexion of hips & knees.

Complications - Meningoencephalitis
① Unconsciousness
seizures
raised ICP
stroke

LAB DIAGNOSIS :-

1.) Specimen :- CSF & blood

2.) Collection : CSF - lumbar puncture → ① cell count
② biochemical analysis
③ bacteriological examination

3.) Transport : NEVER REFRIGERATE
Incubate them at 37°C

Molecular diagnosis - CSF → freezer

• Blood Culture → Automated bottles - BacT, ALERT

• For suspected meningococci - nasopharyngeal swabs, pus or scrapings from rashes → [Stuart's medium]

↳ Selective media - Thayer Martin Medium
New York City Medium

4.) Cytological & Biochemical :-

CSF > 1000 leukocytes /µl → neutrophils (90-95%)

Listeria :- ① lymphocyte count,

Protein content ① glucose level is ① or absent

CSF_p ①①

5.) CSF Microscopy :-

Strept. pneumoniae - GP diplococci, flame or lancelate shaped with clear halo (encapsulated).

N. meningitidis - GN diplococci, encapsulated with adjacent sides flattened (lens or moon shaped).

H. influenzae :- Pleomorphic GN coccobacilli
Capsulated

Ecoli :- GNB, singly

Steph. agalactiae & GPC in short chain

Listeria mono - GP short bacilli

6) Direct Ag detects -

Centrifugation of CSF → supernatant.

Latex agglutination test

From mine :- pneumococcal meningitis

ICT → C- polysaccharide Ag of S. pneumoniae

7) Culture :-

Enriched media - Blood Culture Bottle -(BacT/ALERT)

Brain heart infusion broth (BHI)

IP = 37°C preferably in candle jar (5% CO_2) → 48 hours. (blood & choco agar)

Identification - VITEK or MALDI-TOF

8) Antimicrobial susceptibility test - VITEK

9) Serology - capsular Ag - ELISA

10) Molecular methods : Multiplex PCR

Multiplex real time PCR

Bio Fire Film Array - automated nested multiplex PCR

↓

14 common agents detect

meningococcus :- ctr A

Sod C

pneumococcus : lyt A psa A

H. influenzae - bex A.

Rx :- Mortality - high (20%. pneumococci)

80%. cases - complications

Empirical therapy :-

Adult : IV Ceftriaxone or Cefotaxime & Vancomycin.

If Listeria - Ampicillin (IV)

Neonates - Ampicillin + Gentamicin

IV dexamethasone - ↓ICP

COXSACKIE VIRUS

A

sucking mouse -

→ flaccid paralysis

→ generalized myositis

Manifestation

1) Aseptic meningitis (A7 A9)

2) Herpangina

3) Hand - foot - mouth ds (env 71)

4) Alc hemorrhagic conjunctivitis

B

→ Spastic paraly

→ focal myositis

Necrosis of brown fat

→ Aseptic men

→ Pleurodynia

→ Myocarditis

→ Pericarditis

→ Hepatitis

→ Pancreatitis - Juvenile DM

→ Pregnancy