Meningitis

- Inflammation of inner two layer of meninges.
  Leptomeninges – Arachnoid and piamater.
- Acute Infection of meninges presents with.
  Classic Triad
  1) Headache
  2) Fever
  3) Meningism – Neck stiffness, photophobia, phonophobia.

also present in subarachnoid hemorrhage.

Causes of Meningitis

1) INFECTIVE

Bacterial

New Borns → Gram Negative Bacilli
(Group B streptococ E. Coli. Proteus.
→ Listeria Monocytogenes).

Children → Neisseria meningitidis.
Teens Streptococcus pneumonia.
Mycobacterium Tuberculoris
Hemophilus Influenza.

Older → Neisseria, Strept Pneum. Listeria.
Mycobacterium, Hemophilus Influenza.

Viruses

1) Enterovirus (Cocksackie, Polio)
2) Mumps
3) Influenza
4) Herpes Simplex
5) Varicella Zoster
6) Epstein Barr
7) HIV.

Protozoa and Parasites

- Aamba, P. Falciparum.

Fungi

- Cryptococcus.
- Coccidioidus.
- Candida
- Histoplasma
- Blastomyces.

2) NON INFECTIVE

Malignant diseases
- Bronchial CA
- Breast CA
- leukemia
- lymphoma

Inflammatory
- Sarcoidosis
- SLE
- Behcets disease.

Pathophysiology.

Direct Spread → Through overlying skin, Nose,
Anatomical Defect → Spina Bifida,
Skull Fracture.

Haematogenous
→ Through Blood Brain Barrier.
Pathogens enters CSF.
↓
Causes Cytokines release.
↓
Addition of WBC
↓
Pus → Adhesion
↓
CBF obstruction → Hydrocephalus.
↓
Compression of other structures.
↓
Cranial Nerves
↓
Vision Hearing
Artery
↓
Ischemia

Clinical Features

→ Classic Triad → Headache, Fever, Meningism
Neck stiffness Photophobia
Phonophobia

→ Meningoencephalitis
↳ Altered mental state
- Seizures.

Kernig's Sign

↳ With the hip joint flexed and the knee joint at 90°, the more extension of knee joint causes spasm of the hamstring muscles → +ve in SAH, Meningitis

Brudzinski's Sign

- Passive Flexion of the Neck causes flexion of the hips and knees.

Investigation

① Lumbar Puncture - L3 & L4

↳ Measure Pressure - 50-250mm of water

→ WBC → 0-4 x 10^6/L

→ RBC → 0.4 x 10^6/L

→ Glucose → > 50-60% of blood level.

→ Protein → < 0.45 g/L

→ Microbiology →

② PCR → HIV, Enterovirus, HSV, JB+

③ Lab - Neisseria, ASO, Western Blot

④ CT & MRI → Hemorrhage

	Normal	Subarchnoid	Bacterial	Viral	Tuberculous	Multiple Sclerosis
Pressure	50-200 mm of water	Increased	Normal/ Increased	Normal	Normal/ Increased	Normal
Colour	Clear	Blood stained Xanthochromia	Cloudy	clear	Clear/Cloudy	Clear
RBC	0-4 x 10^6/L	Raised	Normal	Normal	Normal	Normal
WBC	0-4 x 10^6/L	Normal/ Slightly Raised	1000-5000 Polymorphs	20-2000 Lymphocyte	50-5000 Lymphocytes	Lymphocyte
Glucose	>50-60% of Blood level	Normal	Decreased	Normal	Decreased	Normal
Protein	< 0.45 g/L	Increased	Increased	Normal/ Increased	Increased	Normal/ Increased
Micro Biology	Sterile	Sterile	Organism on Gram stain on Culture	Sterile/ Virus	Ziehl Neelsen Stain	Sterile

Lumbar puncture

- It a procedure performed in the emergency department to obtain information about the CSF. Used for Both Therapeutic as well as diagnostic purposes.

Technique:

→ Locating the interspace between L_3-L_4 by palpating posterior superior iliac crest and palpate above L_2-L_3 and below 4-5 to find widest space.

→ With sterile drape and antiseptic solution

→ Anaesthetize above, below and at L_3-4.

→ then Quincke needle is used approximately

for 4-5 cm collecting atleast 2-5 ml of CSF

Indication

- Meningitis, Subarachnoid hemorrhage.
→ Guillain Barre Syndrome.
→ Therapeutic relief of Pseudotumor cerebri

Contraindication

→ Increased intracranial pressure
→ Coagulopathy
→ Brain abscess

Complication

→ Post spinal puncture headache,
→ Bloody tap,
→ Infection, Hemorrhage
→ Cerebral herniation