Tuberculous meningitis hydrocephalus treatment

- Clinico-epidemiological profile of 75 cases of TB meningitis in children and adoloscents
- Endoscopic third ventriculostomy versus ventriculoperitoneal shunt for treating pediatric tuberculous meningitis hydrocephalus: a systematic review and meta-analysis
- Recurrent paradoxical reactions as non-communicating hydrocephalus and basal meningitis in a non-HIV patient with tuberculous meningitis and tuberculoma
- Neuromelanosis masquerading as tubercular bacterial meningitis
- Fatal Mycobacterium avium meningitis in an HIV-negative Vietnamese man: a case report
- A rare case of multiple brain abscesses caused by Nocardia abscessus co-infection with tuberculous meningitis in an immunocompetent patient
- Confirmation of Tuberculous Meningitis Using Metagenomic Next-Generation Sequencing: A Case Report
- Mortality predictors and diagnostic challenges in adult tuberculous meningitis: a retrospective cohort of 100 patients

The hydrocephalus treatment can include medical therapy with dehydrating agents and steroids for patients in good grades and those with communicating hydrocephalus. However, surgery is required for patients with obstructive hydrocephalus and those in poor grades. Surgery can involve either a ventriculoperitoneal shunt or endoscopic third ventriculostomy (ETV) [1].

Effective treatment of hydrocephalus secondary to tuberculous meningitis requires a multidisciplinary approach involving medical therapy, corticosteroids, and neurosurgical interventions.

 1. Anti-tuberculous Therapy (ATT): The cornerstone of treatment is immediate initiation of anti-tuberculous chemotherapy to control infection and inflammation.

Standard Regimen (WHO guidelines):

Intensive phase (2 months):

Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol daily.

Continuation phase (10 months):

Isoniazid and Rifampicin daily.

Extended duration (total 9–12 months) recommended due to CNS involvement.

 2. Corticosteroids (Dexamethasone): Steroids significantly reduce inflammation, cerebral edema, and complications such as infarcts and arachnoiditis, improving neurological outcomes.

Recommended regimen (WHO):

Dexamethasone:

Week 1–2: 0.4 mg/kg/day (IV or oral)

Week 3: 0.3 mg/kg/day

Week 4: 0.2 mg/kg/day

Week 5: 0.1 mg/kg/day, then taper slowly over 4–8 weeks.

 3. Neurosurgical Intervention: Neurosurgical intervention is indicated for hydrocephalus that causes raised intracranial pressure (ICP), deteriorating consciousness, or neurological deficit.

Options include:

Ventriculoperitoneal (VP) shunt (most commonly performed).

External Ventricular Drainage (EVD) as a temporary measure.

Endoscopic Third Ventriculostomy (ETV) in select cases (obstructive type, aqueductal obstruction).

Procedure Indications Advantages Considerations VP Shunt Communicating hydrocephalus, persistent raised ICP. Rapid and effective ICP reduction. Infection risk, shunt blockage, over-drainage. ETV Obstructive hydrocephalus, basal cistern blockage. Avoids shunt complications; physiologic drainage. Less effective in severe arachnoiditis. EVD Acute emergency, unstable patient. Immediate ICP relief, temporary measure. Infection risk, requires hospital monitoring. 4. Supportive Care: ICP management:

Head elevation (30°–45°).

Hyperosmolar therapy (mannitol/hypertonic saline) in emergencies.

Seizure control (antiepileptic drugs if indicated).

Nutrition and hydration support.

Physiotherapy and rehabilitation for residual deficits.

 Follow-up and Monitoring: Regular monitoring with CT or MRI brain scans.

Evaluate for signs of raised ICP, shunt malfunction (headache recurrence, vomiting, altered consciousness).

Continuous neurological and ophthalmological (papilledema) assessments.

 Prognosis and Complications: Early intervention significantly improves neurological outcomes.

Delayed treatment increases risks of neurological deficits, disability, and death.

Complications to monitor:

Shunt infection or malfunction.

Cerebral infarction.

Residual neurological deficits.

 Recommended Treatment Approach: Immediate anti-TB therapy + corticosteroids + early neurosurgical intervention if symptomatic hydrocephalus develops.

Prompt action and multidisciplinary care are key to improving survival and functional outcomes in TBM-associated hydrocephalus.

Endoscopic third ventriculostomy for tuberculous meningitis hydrocephalus treatment

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References

1)

Rajshekhar V. Management of hydrocephalus in patients with tuberculous meningitis. Neurol India. 2009 Jul-Aug;57(4):368-74. doi: 10.4103/0028-3886.55572. PMID: 19770534.