



Pediatric TB Meningitis: Protecting the Minds of Our Future

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World TB Day
March 20, 2024
Webcast

Lana Yamba, MD, MPH, CCRC has the following disclosures to make:

- No conflict of interests
- No relevant financial relationships with any commercial companies pertaining to this educational activity



Case Presentation

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Tuberculosis and Hansen's Disease Program/Binational Tuberculosis Program

Texas Department of State Health Services, Region 11



**Texas Department of State
Health Services**

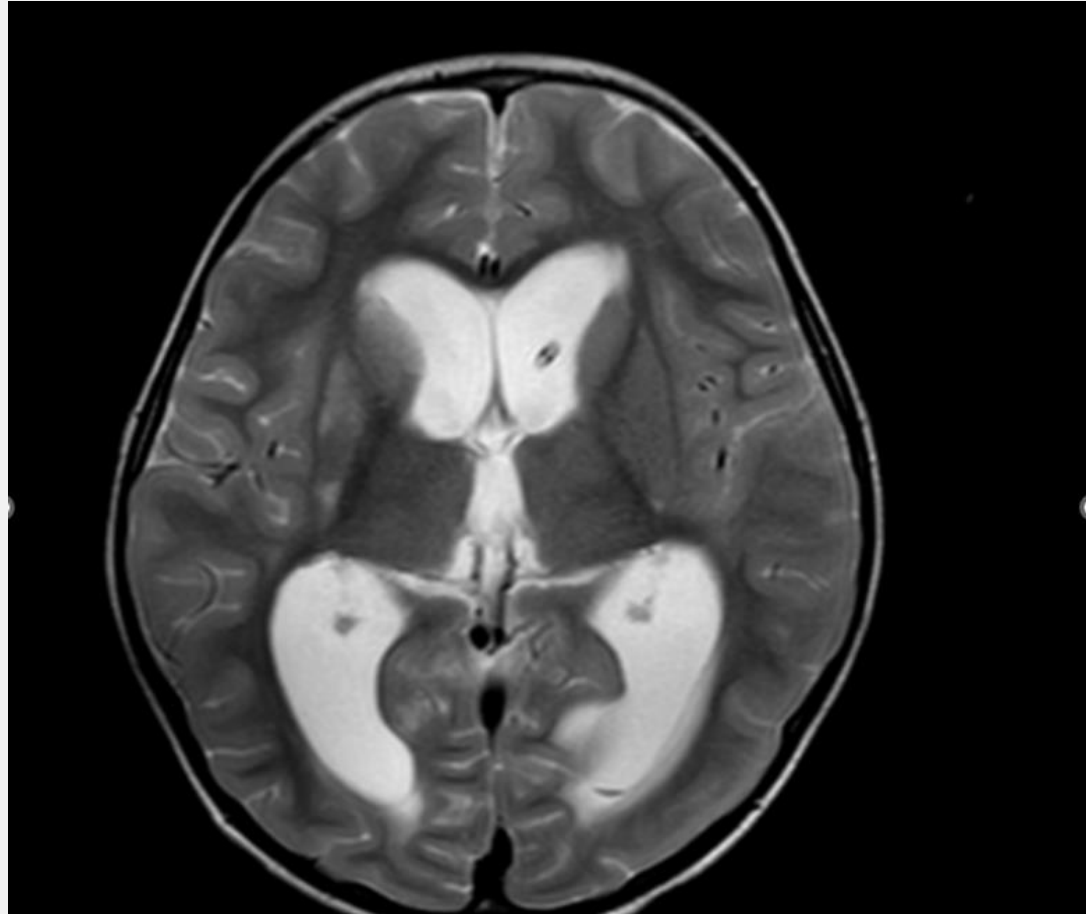
Case presentation

- 2-year-old child referred to us for a better management of TB meningitis.
- Presented first to the ER on 4/6/23 due to worsening high stool burden for 2 weeks. An enema was given for constipation and pt. was discharged home the same day.
- Before that ER visit, the patient had visited the pediatrician multiple times for the same complaint of constipation.
- Then, on 4/9 pt was brought back to the ER due to altered mental status, increased fussiness, vomiting, poor intake, and ataxia.
- On admission, CT revealed hydrocephalus, then she was taken to OR and EVD was placed.

Imaging

- MRI of the brain & spine performed on 4/10 revealed an extensive leptomeningeal enhancement in both brain and spine. In someone of this age demographic, this is most likely related to infectious meningitis. Meningeal neoplastic dissemination is a potential possibility particularly in context of a thoracic lesion.
- 04/09/2023 – 1V CXR – Perihilar bronchovascular prominence as can be seen in the setting of infectious bronchiolitis. No definite focal consolidation seen.
- 04/11/2023 – CT chest, abdomen and pelvis: Mediastinal mass with decreased attenuation, differential diagnosis includes cystic/necrotic lymph nodes as may be seen with infection including tuberculosis or fungal etiologies as well as metastatic carcinoma or lymphoma (CXR did not capture the findings of previous film).

MRI Brain



Laboratory

- T-spot: 04/10/23 -Negative
- T-spot: 04/13/23 – Negative
- PPD: 04/13/23 – 0mm
- Meningitis/Encephalitis Panel PCR Negative, Respiratory Panel Negative, Karius Negative, Blood cultures Negative.
- **CSF Result 04/11/23**
 - CSF Glucose 52
 - CSF Total Protein **113H**
 - CSF RBC **324H**
 - CSF WBC **23H**
 - CSF neutrophil **25H**
 - CSF lymphocyte **39L**

Treatment

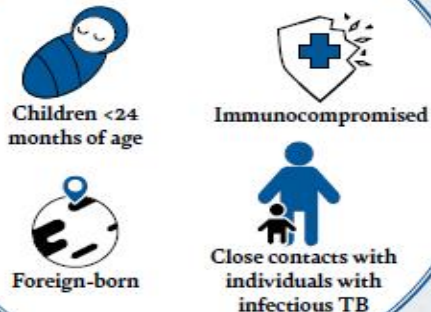
- Based on CSF results, MRI brain, empiric TB treatment was started at the hospital with RIF 10mg/kg, INH 190 mg, PZA 440mg , EMB 260mg and prednisone 1mg/kg
- DSHS staff collected tracheal aspirate: Smear was positive for MTB & NAAT positive.
- After the Health Department evaluated the patient, a consultation request was submitted to Heartland for medication adjustment regarding this pediatric TB meningitis case.
 - INH 200 mg daily
 - Rifampin 300 mg daily
 - Levofloxacin 250 mg daily
 - PZA 500 mg daily
 - Prednisone 20 mg (1.5mg/kg)
 - Discontinue EMB
- Contact Investigation: No source case identified.

Follow up assessment

- Start date of treatment: 04/25/2023 (~11 months into treatment).
- The patient's condition is improving clinically with PT and is able to use the right side of her body, she can now walk again with assistive leg braces. She has recently passed her swallow study but still takes all medication via G-tube. She has become very vocal and is working with speech therapy to help with forming words.
- TB Meningitis poster published on Heartland website: [Fighting Tuberculous Meningitis under 5 \(New\)](#).

Fighting Tuberculous Meningitis under 5

Risk Factors



CDC

Improving Outcomes

Prompt diagnosis and treatment is essential. Failure to begin treatment swiftly results in poorer outcomes, significant and permanent neurological sequelae, or death.



Window Prophylaxis

Close contacts to someone with infectious TB who are <5 years of age should receive treatment for latent TB infection once TB disease is excluded by chest radiograph and symptom review. Treatment is needed even when a TST and/or IGRA is negative. A second TST and/or IGRA should be administered 8 - 10 weeks after the last exposure to infectious TB.



CDC

Assessment & Medical Evaluation

Tuberculous meningitis is more difficult to diagnose than other forms of bacterial meningitis, but thinking of TB as a possibility and rapid screening using various methods in order to make a proper diagnosis is crucial.



Chest X-Ray



Lumbar Puncture (for ALL infants <12 months with suspected TB)



MRI with Contrast

Outcomes for TB Survivors



On average, 54% of children who survived tuberculous meningitis developed neurological sequelae.

The Lancet, 2014

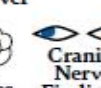
Percent Risk of Disease by Age



Miller, 1963



Watching for Early Signs & Symptoms



HEARTLAND
NATIONAL TB CENTER
THE UNIVERSITY OF TEXAS AT TYLER HEALTH SCIENCE CENTER

For Medical Consultations:

(800) TEX-LUNG or (800) 839-5864

<http://www.heartlandntbc.org/consultation>

Note: Young children may not be able to share or verbalize these symptoms when asked, so collaborating with care givers will be imperative.

Thank you!

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