STANDARD TREATMENT WORKFLOW (STW)

Paediatric Tubercular Meningitis

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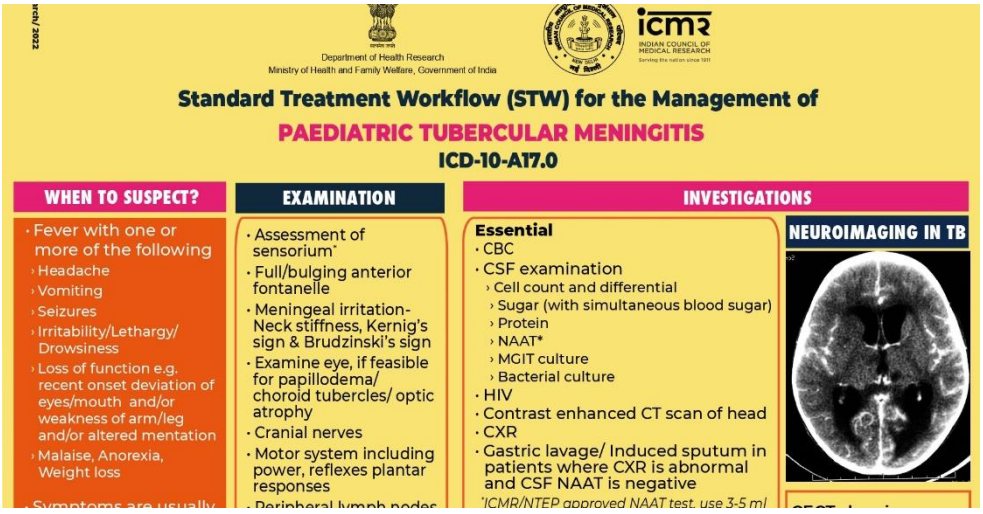

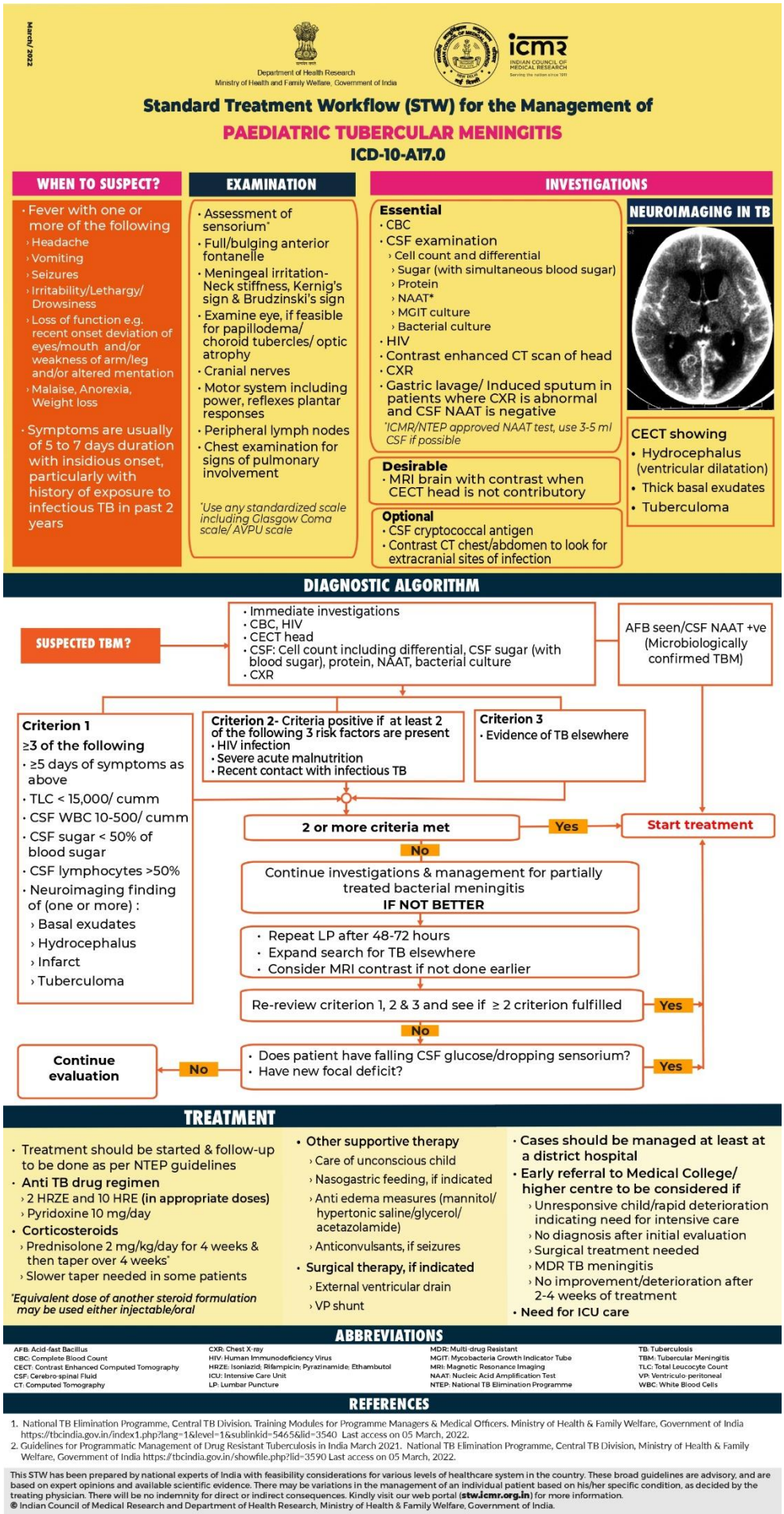
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Standard Treatment Workflow (STW) for the Management of
PAEDIATRIC TUBERCULAR MENINGITIS
ICD-10-A17.0
WHEN TO SUSPECT?
· Fever with one or more of the following
› Headache
› Vomiting
› Seizures
› Irritability/Lethargy/ Drowsiness
› Loss of function e.g. recent onset deviation of eyes/mouth and/or weakness of arm/leg and/or altered mentation
› Malaise, Anorexia, Weight loss
· Symptoms are usually of 5 to 7 days duration with insidious onset, particularly with history of exposure to infectious TB in past 2 years
EXAMINATION
· Assessment of sensorium*
· Full/bulging anterior fontanelle
· Meningeal irritation- Neck stiffness, Kernig's sign & Brudzinski's sign
· Examine eye, if feasible for papillodema/ choroid tubercles/ optic atrophy
· Cranial nerves
· Motor system including power, reflexes plantar responses
· Peripheral lymph nodes
· Chest examination for signs of pulmonary involvement
*Use any standardized scale including Glasgow Coma scale/ AVPU scale
INVESTIGATIONS
Essential
· CBC
· CSF examination
› Cell count and differential
› Sugar (with simultaneous blood sugar)
› Protein
› NAAT*
› MGIT culture
› Bacterial culture
· HIV
· Contrast enhanced CT scan of head
· CXR
· Gastric lavage/ Induced sputum in patients where CXR is abnormal and CSF NAAT is negative
*ICMR/NTEP approved NAAT test, use 3-5 ml CSF if possible
Desirable
· MRI brain with contrast when CECT head is not contributory
Optional
· CSF cryptococcal antigen
· Contrast CT chest/abdomen to look for extracranial sites of infection
NEUROIMAGING IN TB
CECT showing
• Hydrocephalus (ventricular dilatation)
• Thick basal exudates
• Tuberculoma
DIAGNOSTIC ALGORITHM
SUSPECTED TBM?
· Immediate investigations
· CBC, HIV
· CECT head
· CSF: Cell count including differential, CSF sugar (with blood sugar), protein, NAAT, bacterial culture
· CXR
AFB seen/CSF NAAT +ve (Microbiologically confirmed TBM)
Criterion 1
≥3 of the following
· ≥5 days of symptoms as above
· TLC < 15,000/ cumm
· CSF WBC 10-500/ cumm
· CSF sugar < 50% of blood sugar
· CSF lymphocytes >50%
· Neuroimaging finding of (one or more) :
› Basal exudates
› Hydrocephalus
› Infarct
› Tuberculoma
Criterion 2- Criteria positive if at least 2 of the following 3 risk factors are present
· HIV infection
· Severe acute malnutrition
· Recent contact with infectious TB
Criterion 3
· Evidence of TB elsewhere
2 or more criteria met
Yes
Start treatment
No
Continue investigations & management for partially treated bacterial meningitis
IF NOT BETTER
· Repeat LP after 48-72 hours
· Expand search for TB elsewhere
· Consider MRI contrast if not done earlier
Re-review criterion 1, 2 & 3 and see if ≥ 2 criterion fulfilled
Yes
No
· Does patient have falling CSF glucose/dropping sensorium?
· Have new focal deficit?
Yes
No
Continue evaluation
TREATMENT
· Treatment should be started & follow-up to be done as per NTEP guidelines
· Anti TB drug regimen
› 2 HRZE and 10 HRE (in appropriate doses)
› Pyridoxine 10 mg/day
· Corticosteroids
› Prednisolone 2 mg/kg/day for 4 weeks & then taper over 4 weeks*
› Slower taper needed in some patients
*Equivalent dose of another steroid formulation may be used either injectable/oral
· Other supportive therapy
› Care of unconscious child
› Nasogastric feeding, if indicated
› Anti edema measures (mannitol/ hypertonic saline/glycerol/ acetazolamide)
› Anticonvulsants, if seizures
· Surgical therapy, if indicated
› External ventricular drain
› VP shunt
· Cases should be managed at least at a district hospital
· Early referral to Medical College/ higher centre to be considered if
› Unresponsive child/rapid deterioration indicating need for intensive care
› No diagnosis after initial evaluation
› Surgical treatment needed
› MDR TB meningitis
› No improvement/deterioration after 2-4 weeks of treatment
· Need for ICU care
ABBREVIATIONS
AFB: Acid-fast Bacillus
CBC: Complete Blood Count
CECT: Contrast Enhanced Computed Tomography
CSF: Cerebro-spinal Fluid
CT: Computed Tomography
CXR: Chest X-ray
HIV: Human Immunodeficiency Virus
HRZE: Isoniazid; Rifampicin; Pyrazinamide; Ethambutol
ICU: Intensive Care Unit
LP: Lumbar Puncture
MDR: Multi-drug Resistant
MGIT: Mycobacteria Growth Indicator Tube
MRI: Magnetic Resonance Imaging
NAAT: Nucleic Acid Amplification Test
NTEP: National TB Elimination Programme
TB: Tuberculosis
TBM: Tubercular Meningitis
TLC: Total Leucocyte Count
VP: Ventriculo-peritoneal
WBC: White Blood Cells
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