MENINGITIS

Clinical Data

Prior disease
Febrile illness, URI, acute otitis/mastoiditis, pneumonia (S.pneumoniae), herpangina (Coxsackie), pleurodynia (Coxsackie B) Parotitis (mumps)
Fever, rigors, profuse sweat, nausea, vomiting

Onset
Fulminant, major disease in 24hrs (25%); URI then meningitis in 3-7 days (50%); URI 3 weeks then meningitis (20%)
Gastro-intestinal disease then meningitis (entero-virus);

Meningeal irritation
Brain swelling
Focal neurologic deficit
Cranial nerve dysfunction

Drowsiness, decreased mentation, stiff neck, Brudzinski sign, Kernig; minimal in infants or elderly
Headache, photophobia, altered mental status (confusion, coma), seizure (25%), hypotension, bradycardia, abnormal reflexes
Hemiparesis (10%), aphasia (5%), visual field defect (2%), gaze preference (10%)

Rash
Rash macular erythematous then petechial or purpuric; myalgia (Meningoccemia /Emergency; rarely S.pneumoniae, H.flu, ECHO 9) Rubella-like rash (ECHO, Coxsackie)

History/Risk factors

Outbreak in community
Mumps, measles, varicella, meningococcal meningitis
Season
Late summer /early autumn (enterovirus, arbovirus), late winter early spring (mumps)

Age for bacterial M

Neonates
E.coli, Streptococcus group B or D, Listeria monocytogenes
Neonate + few days
Klebsiella/Enterobacter/Serratia nosocomial from nursery
Adults
Hemophilus influenzae (48%), Streptococcus pneumoniae (13%), Neisseria meningitidis
Streptococcus pneumoniae (30-50%), Neisseria meningitidis (10-35%), Staphylococci (5-15%), Gram neg (1-10%), Streptococci (5%), Listeria (5%) Hemophilus influenzae (1-3%)

Risk Factors
S.pneumoniae
HIV, Hodgkin, multiple myeloma, spleen dysfn, sickle cell, diabetes, alcoholism
Staphylococci
Congestive heart failure, chronic pulmonary, nephrotic some
Leptospira
Neurosurgery, penetrating trauma
Farmer, work with sewer, animal (vet, dairy, abattoir, hunter), exposure to animal urine

Lab tests

Bacteremia & Sepsis; Brain abscess; Seizures; Encephalitis
Increased pressure: Abn > 150 mmH2O; >450mm = acute brain swelling
Cell count
Bacterial: Early 10-20; later 100-10,000 /mm3 with 80% polymorphonuclear;
Bacteria special
lymphocytes (Mtb, Borelia, Treponema, Listeria, Leptospirosis)
Viral: 50-100; rarely up to 4,000; partially treated bacterial meningitis similar to viral
Glucose
Bacterial Low 40 mg/dL or 40% of blood level (+++most useful to differentiate from viral);
Viral Normal (compare with blood level in diabetics)
Protein
High 100-150mg /dl, up to 500; >1,000 in subarachnoid blockage

Bacteriology
Gram stain (80% pos in bacterial meningitis); Culture; Phadebact
Virology
During outbreak: throat wash, CSF, stool, blood rarely
Other
Blood cultures; renal function (for Tx); electrolytes and creatinine for inadequate ADH some; coagulation

Differential
Seizures;
Brain abscess, subdural empyema: Focal lesions, high cell count (>50,000)
Bacteremia & Sepsis, endocarditis with embolic infarction in brain
Post infectious encephalomyelopathy: measles, mumps, varicella; Viral some (influenza)
Post vaccine reactions: rables, smallpox
Encephalitis;
Carcinomatous meningitis, meningeval leukemia,

Etiology: Bacterial
URI colonizers w capsular antigens: Streptococcus pneumoniae; S. group B or D, Hemophilus influenzae; Neisseria meningitidis
Staphylococci, Listeria monocytogenes
E.coli, Gram neg

Etiology: Viral
Enteroviruses: CoxsackieA (2,3,4,7,9,10), B (1-6: US 33%), ECHO (US 50%), polio
Lymphocytic chorio meningitis (LCM), Cytomegalovirus (CMV), Mumps
Herpes simplex, herpes zoster, adenovirus
Arbor virus

Etiology: Fungal
Cryptococcus

Treatment
Empiric based on age as main determinant of etiology
Neonate Ampicillin 200 mg/kg + Aminoglycoside (Gentamicin) 2.5-5 mg/kg for 10 days
Children <2mos Cefotaxime 50 mg/kg qid (200 mg/kd/day) or ceftriaxone 100 mg/kg /day
Adult: S.pn, H.i. Cefotaxime 2g IV x6/day or Ceftriaxone 2g IV /day
Adult: Staph Vancomycin 1g bid
Listeria TMP 160mg - SMX 800 mg IV qid

HDept Management
Collect Hx of travel, food, household, school attendance, participation in groups - Hx of outbreak in community
Management depends on etiologic diagnosis
Investigate source, contacts, associates for H.influenzae type b, Neisseria meningitidis, aseptic meningitis
H.influenzae type b HH Contact prophylaxis; Vaccine
N. meningitidis HH /day care /intimate contact prophylaxis; Vaccine

Infection Control
Depending on etiologic diagnosis: Droplet or Contact (enteric) precautions while infectious

http://www.infectiousdisease.dhh.louisiana.gov (800)256-2748