MENINGITIS IN A NUTSHELL

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INTRODUCTION

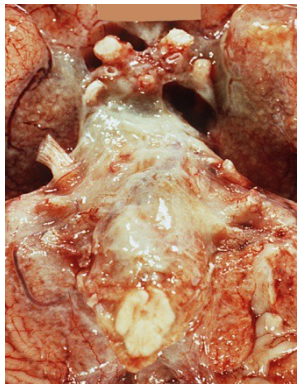
- Serious infection of the meninges
- Approx. 3400 in UK per year
- Can kill in <4hrs
- 80% <20yrs old, half of these <5yrs old
- Blood-borne
- Direct spread
    - Penetrating wounds inc. Skull #
    - Infection of middle ear, mastoid, nasal sinuses & dural venous sinuses

VIRAL MENINGITIS

- *Mumps, Coxsackie, Epstein-Barr, Polio, HIV*
- Benign & self-limiting (4-10 days)
- Lymphocytic inflammatory CSF reaction
- NO pus formation/ polymorphs/ adhesions
- Little/No cerebral oedema unless encephalitis develops

CHRONIC MENINGITIS

- *Mycobacterium tuberculosis, Treponema Pallidum (Syphilis), Borrelia burgdorferi (Lyme Disease)*
- Chronic & granulomatous infection
- Brain covered in viscous exudate with numerous meningeal tubercles
- Adhesions
- **Cerebral Oedema!!**

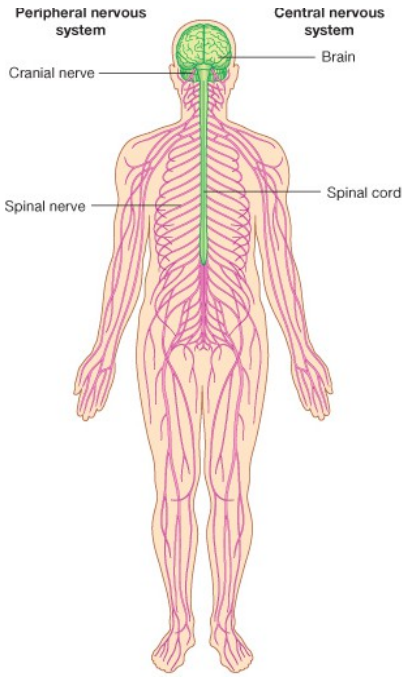


BACTERIAL MENINGITIS

- *Neisseria meningitidis, Strep. Pneumoniae (>70%)*
- *Haemophilus influenzae, Listeria monocytogenes*
- Acute purulent meningitis

- Pia-arachnoid congested with polymorphs
- Pus layer -> Adhesions
    - Cranial Nerve Palsies
    - Hydrocephalus

BACTERIAL MENINGITIS SYMPTOMS & SIGNS



COMPLICATIONS

- Venous Sinus Thrombosis
- Severe Cerebral Oedema
- Inflammatory drainage -> exudate -> Obstruction of CSF Hydrocephalus
- Cerebral Abscess
- Encephalitis
- **Mortality (1 in 10)!**

DIFFERENTIALS

- MIGRAINE
- SAH
- INTRACRANIAL MASS LESION
- ENCEPHALITIS
- CEREBRAL MALARIA
- DENGUE
- TETANUS

Consider meningitis in anyone with sudden onset headache & fever

Chronic meningitis sometimes resembles intracranial mass lesion with headache, epilepsy & focal signs.

MANAGEMENT-1

- Hx & Examination
- Bloods *(FBC, U&E, LFT, Glucose, CRP)*
- Blood Cultures
- CXR
- Lumbar Puncture *(MC&S, Gram stain, Protein, Glucose, Virology)*
- CT Head *(before LP IF mass lesion/raised ICP suspected)*

CSF IN MENINGITIS

	ACUTE BACTERIAL	TUBERCULOSIS	VIRAL
APPEARANCE	TURBID	FIBRIN WEB	USUALLY CLEAR
CELLS	POLYMORPHS	MONONUCLEAR	MONONUCLEAR
GLUCOSE	<1/2 PLASMA	<1/2 PLASMA	>1/2 PLASMA
PROTEIN (g/L)	>1.5	1-5	<1
BACTERIA	IN SMEAR & CULTURE	OFTEN NONE SEEN IN SMEAR	NONE SEEN/CULTURED

MANAGEMENT-2

- UNKNOWN AETIOLOGY
    - Benzylpenicillin 1.2g IV STAT (community)

- Cefotaxime 2g IV 6hrly OR Ceftriaxone 2g IV bd, minimum 10days (1st line)

- Pneumococcal
  - Benzylpenicillin 1.8g IV 4hrly (1st line)
  - PLUS Vancomycin 1g IV bd
  - PLUS Rifampicin 600mg IV bd 10-14days
- Meningococcal
  - Benzylpenicillin 1.8g IV 4hrly 5-7days (1st line)
  - Cefotaxime 2g IV 6hrly OR Ceftriaxone 2g IV bd, 5-7days (2nd line)

- **DEXAMETHASONE**
  - Adjuvant therapy
  - ?Diminishes hearing loss/ ?Prevents neurological complications
  - No significant effect, benefits unproven *(Meta-analysis, Lancet 2010)*
  - Give before OR with 1st dose of Abx OR within 4hrs of commencing Abx
  - Do not give if >12hrs after starting Abx OR <3mnths old *(NICE guidelines)*

NICE GUIDELINES

PRE-HOSPITAL MANAGEMENT (MENINGOCCOCAL/BACTERIAL MENINGTIS)

- Non-Blanching Rash + Strong Clinical Suspicion -> IM/IV Benzylpenicillin (unless delays hospital transfer)
- Strong Clinical Supsicion but NO non-blanching rash -> Emergency hospital transfer
- Bacterial Meningitis Pathway:
  - ABCDE, Bloods & Cultures
  - LP (if no sign of raised ICP or Shock, otherwise meningococcal pathway)
  - Empirical Abx (IV Cefotaxime <3months, IV Cefotriaxone >3months)
  - D/W micro or check trust guidelines once disease confirmed
- Meningococcal Disease Pathway:
  - If raised ICP/Shock
  - Fluid Resuscitation
  - PICU transfer

LONG-TERM SEQUELAE

- 1 in 7 who survive are left severely debilitated!
- Sensorineural hearing loss
- Seizures
- Hemiparesis
- Cranial Nerve Palsies
- Orthopaedic Complications
- Dermatology problems (Scarring & Contractures from necrosis)
- Psychosocial problems
- Developmental problems

UK VACCINATION PROGRAMME

Currently no vaccine against Meningitis B (90% of all meningococcal cases in UK)!

- 2 Months
  - 5 in 1 (Diptheria/Tetanus/Pertussis/Polio /HiB)
  - PCV
- 3 Months
  - 5 in 1 (2nd dose)
  - Meningitis C
- 4 Months
  - 5 in 1 (3rd dose)
  - PCV (2nd dose)
  - Meningitis C (2nd dose)
- 12-13 Months
  - MMR
  - HiB/Men C booster
  - PCV (3rd dose)