

VAQ 2011.2.6 (CSF)

A 30 year old man undergoes a lumbar puncture in the emergency department for investigation of fever, headache and vomiting.

His cerebrospinal fluid and serum glucose results are as follows:

			Reference Range
Opening pressure	220	mm H ₂ O (supine)	(50-200)
Colour:	mildly turbid		
WCC	400	/ml (predominance of lymphocytes)	(0-2)
RBC	10	/ml	(0)
Protein:	1.2	g/L	(0.2-0.5)
CSF glucose	2.2	mmol/L	
Gram stain	No organisms seen		
Serum glucose	6.2	mmol/L	(3.0-8.0)

a. Describe and interpret his results (50%)

b. Outline the further investigations you would consider in order to identify the cause of these findings (50%)

Clinical and lab evidence of meningitis

concern is for bacterial or 'atypical' meningitis
overall picture is most consistent with TB / fungal or partially treated bacterial meningitis
low glucose, turbidity suggest against viral cause
tumour meningitis or non-infectious (e.g. cerebral vasculitis) not supported by low CSF glucose

Investigations aimed at clarifying underlying cause

culture and sensitivities

viral PCR

risk factor assessment

HSV, HIV, immunosuppressed causes

TB exposure and risk

Opening pressure – mildly raised

clinically in keeping with meningitis / encephalitis

much less likely cerebral abscess or tumour / CSF drainage dysfunction

Mildly turbid

meningitis

bacterial, TB/fungal most likely

not expected with viral or other 'aseptic' meningitis

WCC 400

markedly raised with minimally raised RCC

meningeal inflammation

meningitis

low WCC for bacterial meningitis

partially treated bacterial meningitis

TB meningitis

viral meningitis

HSV aseptic meningitis

CSF lymphocytosis

viral meningitis

partially treated bacterial meningitis

TB meningitis

HSV meningitis

EBV meningitis

encephalitis

CSF proteinosis

lower than expected for bacterial meningitis

TB, viral ('aseptic' meningitis)

clinical history not supportive of e.g. MS / GBS proteinosis

Gram stain

expect positive in up to 60-90% of bacterial meningitis

does not rule out bacterial cause especially partly treated

otherwise nondiagnostic as cause for meningeal inflammation

CSF:blood glucose suggestive of bacterial or TB/fungal meningitis

Investigations

bedside

no additional tests

lab (need rationale)

FBC

raised WCC – infection

ELFT

renal dysfunction with severe sepsis

hyponatraemia with TB

Hepatic encephalopathy with EBV, CMV

Coag

DIC with sepsis

CD4 count/HIV serology

if clinical assessment supports

Serology

CSF

culture and sensitivities

AAFB and india ink staining for cryptococcus/TB

Viral PCR – HSV/EBV/TB/CMV/Enterococcus

Blood

blood culture

CMV, HSV, EBV serology

Radiology (need rationale)

Chest radiograph

evidence of TB

CT brain / contrast

cerebral abscess

MRI brain

encephalitis

cerebral abscess

infected venous sinus thrombosis