

Infective Encephalitis in Adults - Microbiology Summary Hospital Guideline

Reference number: CG-ANTI/2023/019

Clinical concerns re encephalitis

Assessment of airway, breathing, circulation, disability, and exposure ([ABCDE](#))
In collaboration with the team senior, refer for level 2 (high dependency unit) or 3 (intensive care unit) management

± Investigation with CT head – **before LP**

- Neuroimaging is indicated before LP in patients with: (i) focal neurological symptoms or signs; (ii) seizures; and/or, (iii) GCS ≤ 12

± Investigation with LP

- Contraindications to LP include: (i) continuous or uncontrolled seizures; (ii) risk of cerebral herniation/'coning' identified on CT head scan, e.g. brain swelling or shift; (iii) infection at the site of LP; (iv) rapidly evolving rash; (v) respiratory or cardiac compromise; (vi) sepsis/septic shock; (vii) low platelet count/thrombocytopenia; (viii) clotting disorder; (ix) anticoagulant therapy

If delay in LP > 6 hours, start aciclovir before LP

Investigation – **without history of immunocompromise**

- CSF for:
 - Opening pressure
 - Biochemistry: protein and glucose
 - Microbiology: microscopy (WBC, RBC, and Gram stain); and culture; and PCR (HSV, enterovirus, and VZV)
- Plasma for: glucose
- Serum for: (i) blood-borne virus (HIV, hepatitis B, and hepatitis C) screen; (ii) if LFTs indicate hepatitis, hepatitis A, hepatitis E, CMV, and EBV testing; (iii) storage

or

Investigation – **with history of immunocompromise**

- CSF for:
 - Opening pressure
 - Biochemistry: protein and glucose
 - Microbiology: microscopy (WBC, RBC, Gram stain, AAFB stain, and India ink stain [or cryptococcal antigen assay]); and culture (including for *Mycobacterium* species ± *Coccidioides* species ± *Histoplasma* species); and PCR (HSV, Enterovirus, VZV, CMV, and EBV; ± extended testing – in discussion with a clinical virologist – for adenovirus, BK virus, hepatitis E, HHV6, HHV7, influenza A virus, influenza B virus, JC virus, measles virus, mumps virus, and parvovirus B19)
- Plasma for: glucose
- Serum for: (i) blood-borne virus (HIV, hepatitis B, and hepatitis C) screen; (ii) if LFTs indicate hepatitis, add hepatitis A, hepatitis E, CMV, and EBV testing; (iii) *Treponema* species/syphilis screen (if positive, CSF for *Treponema* species PCR); (iv) *Toxoplasma gondii*/toxoplasmosis screen (if positive, CSF for *Toxoplasma gondii* PCR); (v) storage
- Blood cultures

Treatment – empiric, intravenous antimicrobials

- If (i) the differential diagnosis includes HSV or VZV encephalitis, or (ii) the CSF is indicative of viral encephalitis, or (iii) the neuroimaging is indicative of viral encephalitis:
 - **Anti-virals within 6 hours:** aciclovir 10 mg/kg ([adjusted body weight](#)¹) 8 hourly
- If (i) the differential diagnosis includes bacterial, fungal, or parasitic encephalitis, or (ii) past medical history or drug history includes immunocompromise, please liaise with the duty/on call microbiologist

Neurologist review of inpatients diagnosed with encephalitis within 24 hours of diagnosis

Investigation with MRI head – **after lumbar puncture**

- If (i) the differential diagnosis includes HSV or VZV encephalitis, or (ii) the CSF is indicative of viral encephalitis, or (iii) the initial neuroimaging is indicative of viral encephalitis, MRI head optimally within 48 hours

First LP/CSF positive

- HSV and VZV: aciclovir 10 mg/kg ([adjusted body weight](#)¹) 8 hourly
 - **without immunocompromise** ≥ 14 days
 - **with immunocompromise** ≥ 21 days
- Bacterial, fungal, parasitic, and other viruses:
 - Collaborate with the neurology, virology, and microbiology teams

First LP/CSF negative

- If the first CSF is negative, and if there is ongoing clinical concerns re encephalitis, repeat LP/second CSF for investigation after 24-48 hours
- Liaise with the neurology, virology, and microbiology teams for:
 - Differential diagnosis collaborative discussions with (i) history of presenting complaint, (ii) past medical history, (iii) drug history, (iv) family history, and (v) social history, especially travel

- ¹Adjusted body weight (kg) = ideal body weight (kg) + 0.4(actual body weight [kg] - ideal body weight [kg])
 - Devine formula for ideal body weight (kg) in females = 45.5 kg + 2.3 kg(height [inches] - 60)
 - Devine formula for ideal body weight (kg) in males = 50 kg + 2.3 kg(height [inches] - 60)

Second LP/CSF negative

- If the first and second CSFs are negative, and if there are neither HSV- nor VZV-encephalitis investigative findings on MRI:
 - Consider discontinuing anti-virals, in collaboration with the responsible physician
- Liaise with the neurologist for:
 - Collaborative discussions re differential diagnosis

NB Discharge from neurology (or liaise with neurologist on discharge) with:

- Formal cognitive assessment, e.g. Montreal Cognitive Assessment, ± occupational therapy
- Healthcare professional input re driving, employment, etc.
- Information re the Encephalitis Society, e.g. <https://www.encephalitis.info/>
- Neurology outpatient appointment

References

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Document control

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