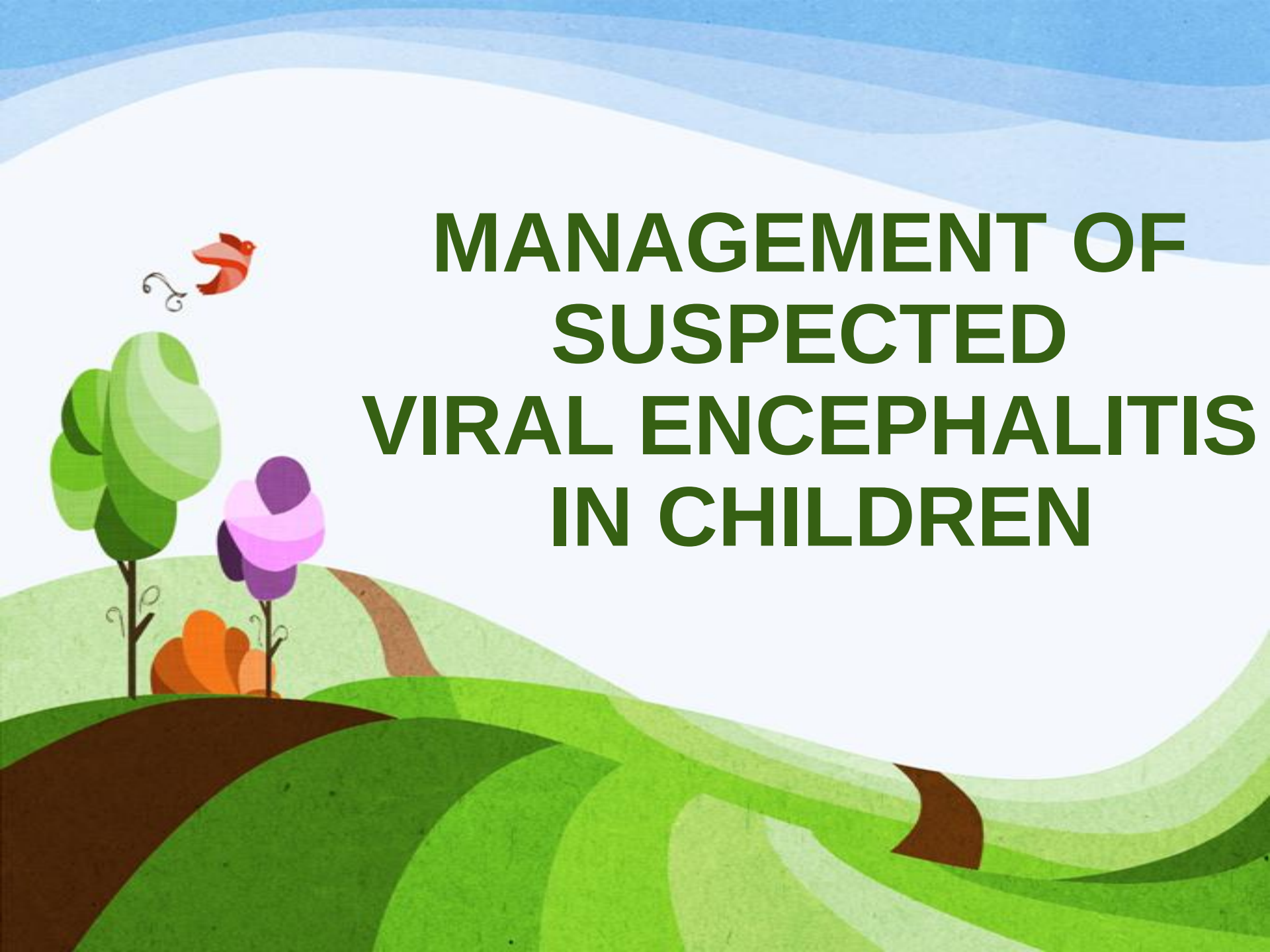

MANAGEMENT OF SUSPECTED VIRAL ENCEPHALITIS IN CHILDREN

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ELSEVIER

OVERVIEW

- 1980s: dramatically improved by aciclovir HSV encephalitis in adults
- Delays treatment(> 48h after hospital admission): associated with a worse prognosis.

OVERVIEW

- Syndrome of neurological dysfunction: inflammation of the brain parenchyma
- Many causes:
  - ✓Infectious: viruses, bacteria, parasites and fungi
  - ✓Non- infectious: antibody-mediated

RECOMMENDATION

Table 5 GRADE rating system for the strength of the guidelines recommendations and the quality of the evidence (Atkins, Best et al., 2004).[20]

Strength of the recommendation	Quality of the evidence
A Strongly recommended	**I** Evidence from randomised controlled trials
B Recommended, but other alternatives may be acceptable	**II** Evidence from non-randomised studies
C Weakly recommended: seek alternatives	**III** Expert opinion only
D Never recommended	

- Which clinical features should lead to a suspicion of encephalitis in children?

RECOMMENDATION

- Current or recent febrile illness: altered behaviour, personality, cognition or consciousness, seizures or new focal neurological signs (A, II)
- The differential diagnosis: metabolic, toxic, autoimmune causes or sepsis outside the CNS (B, III), past history is very important
- Sub-acute (weeks to months) encephalitis: autoimmune, paraneoplastic, metabolic aetiologies (C, III)
- Priority of the investigations: determined by clinical history and clinical presentation (C, III)

RECOMMENDATION

- Diagnostic features for specific aetiologies?
  - ✓Age
  - ✓ Immunocompetence
  - ✓ Geography
  - ✓Exposure.

HSV encephalitis

RECOMMENDATION

- Symptom: non – specific
- Children: labial – herpes is diagnostic specific (develop encephalitis with primary HSV infection)
- Acute opercular syndrome (disturbance of voluntary control of the facio-linguo-glosso-pharyngeal muscles leading to oro-facial palsy, dysarthria and dysphagia)
- Sexual abuse

- Varicella zoster encephalitis

RECOMMENDATION

- Acute/sub-acute: fever, headache, altered consciousness, ataxia and seizures
- Post-infective immunemediated cerebellitis (1 week to 48 months)
- Acute infective viral encephalitis or a vasculopathy
- hydrocephalus secondary
- PCR/IgG in CSF

EBV encephalitis

RECOMMENDATION

- Teenagers
- Altered level of consciousness, seizures and visual hallucinations

RECOMMENDATION

- Encephalitis associated with respiratory illnesses: influenza viruses, paramyxoviruses, bacterium M. pneumoniae.

RECOMMENDATION

- Rashes: Rickettsial, measles virus (acute/sub-acute)
- HHV6 (and possibly HHV7):
  - ✓< 2 years old
  - ✓severe disease, sequelae far beyond.
  - ✓Ataxia, prolonged convulsions, gastrointestinal symptoms, high fever and rash systemically

- Which patients with suspected encephalitis should have a lumbar puncture (LP), and in which should this be preceded by a CTscan?

RECOMMENDATION

- Suspected encephalitis: LP as soon as possible, unless there is a clinical contraindication (A, II)
- Clinical assessment and not cranial CT should be used to determine if it is safe to perform a LP (A, II)

- What information should be gathered from the LP?

RECOMMENDATION

- Opening pressure (A, II)
- Total and differential white cell count, culture and sensitivities for bacteria (A, II)
- Protein, lactate and glucose (A, II)
- A sample: sent and stored for virological investigations or other future investigation (A, II)
- Culture for Mycobacterium tuberculosis when clinically indicated (A, II)
- If have strong clinical diagnosis, but CSF results are normal, a second LP should be repeat (consideration for antibody detection) (A, II)

- What virological investigations should be performed?

RECOMMENDATION

- Suspected encephalitis: CSF PCR test for HSV (1 and 2), VZV and enteroviruses (identify 90% of known viral cases) and EBV considered (B, II)
- Further testing: guided by the clinical features (travel history and animal or insect contact (B, III)

- What antibody testing should be done on serum & CSF?

RECOMMENDATION

- Suspected encephalitis: PCR of CSF was not performed acutely, a later CSF sample (at approximately 10-14 days after onset) should be sent (for HSV specific IgG antibody testing (B, III)
- Avivirus encephalitis: CSF: tested for IgM antibody (B, II)

- What PCR/culture should be done on other samples (e.g. throat swab, stool, vesicle etc)?

RECOMMENDATION

- Investigation: between a specialist in microbiology, virology, infectious diseases and the clinical team (B, III)
- Throat and rectal swabs for enterovirus investigations should be considered (B, II)
- suspicion of mumps: CSF PCR, should be performed for this and parotid gland duct or buccal swabs should be sent for viral culture or PCR (B, II)

- Which children with encephalitis should have an HIV test?

RECOMMENDATION

- HIV test be performed on all patients with encephalitis, or with suspected encephalitis irrespective of apparent risk factors (A, II)

- What is the role of MRI and other advanced imaging techniques in children with suspected viral encephalitis?

RECOMMENDATION

- MRI: as soon as possible on all patients with suspected encephalitis/ diagnosis is uncertain, 24 hrs – 48 hrs after hospital admission (B, II).
- MRI: chosen appropriately should be interpreted by an experienced paediatric neuroradiologist.
- SPECT and PET are not indicated in the assessment of suspected acute viral encephalitis (B, II)

- For which patients should aciclovir treatment be started empirically?

RECOMMENDATIO

- Initial CSF and/or imaging suspected encephalitis: start acyclovir within 6 hours of admission if these results are awaited (A, II).
- First CSF/imaging: normal, clinical suspicion of HSV or VZV encephalitis: start acyclovir within 6 hours of admission whilst further diagnostic investigations are awaited (A, II)

RECOMMENDATION

- Dose?
  - ✓3 months-12 years 500mg/m2 8 hourly
  - ✓ >12 years 10mg/kg 8 hourly
  - ✓reduced in patients with pre-existing renal impairment (A, II)
  - ✓If meningitis is also suspected, should also be treated (A, II)

- How long should acyclovir be continued in proven HSV encephalitis, and is there a role for oral treatment?

RECOMMENDATION

- Proven: continued for 14-21 days (A, II), repeat LP
- CSF PCR is still positive for HSV: aciclovir should continue, with weekly CSF PCR until it is negative (B, II)
- 3 months-12 years a minimum of 21 days of aciclovir should be given before repeating the LP (B, III)

- When can presumptive treatment with aciclovir be safely stopped, in patients that are HSV PCR negative?

RECOMMENDATION

- An alternative diagnosis has been made, or
- HSV PCR in the CSF is negative on two occasions 24-48 hours apart, and MRI imaging (performed >72 hours after symptom onset), is not characteristic for HSV encephalitis, or
- HSV PCR in the CSF is negative once >72 hours after neurological symptom onset, with normal level of consciousness, normal MRI, CSF white cell count of less than 5 106/L (B, III)

- What is the role of corticosteroids in HSVB encephalitis?

RECOMMENDATION

- Corticosteroids should not be used routinely in patients with HSV encephalitis (B, III)
- Corticosteroids may have a role in patients with HSV encephalitis under specialist supervision (study results are awaited (C, III))

- What should be the specific management of VZV encephalitis?

RECOMMENDATION

- No specific treatment for VZV cerebellitis (B, II).
- Primary infection/reactivation, IV aciclovir 500mg/m2 (3 months-12 yrs) or 10-15mg/kg (if aged >12 yrs) three times daily is recommended (B, II)
- If there is a vascopathy (i.e. stroke), there is a case for using corticosteroids (B, II)

What should be the specific management of enterovirus meningoencephalitis?

RECOMMENDATION

- No specific treatment; in patients with severe disease pleconaril (if available) or IVIG may be worth considering (C, III)

THANK YOU!