

Encephalitis

* Def: inflammation of Brain parenchyma.

* classification

- Acute (Majority) / Chronic (SSPE)
- localized (HSV → temporal) / Generalized ^{MC}
- non-infectious → called encephalopathy / Infectious
 - As HTN / Reye's / Uremic
 - viral
 - Bacterial
 - fungal
 - ...

* Viral Encephalopathy (Most common 95%)
↳ Mortality Rate → 5%

→ Causes

① Arboviruses (West Nile → ↑ incidence But not MC!

② Enterovirus ③ Herpesvirus
↳ MCC

④ HIV

→ pathophysiology.

virus enter blood → localized to brain → inflammatory process → cerebral edema
→ destruction of nerve cells → bleeding

→ Diffusely affect Gray matter.

→ long term complications?

- ① paresis or spasticity ② Cognitive impairment ③ Weakness
- ④ Ataxia ⑤ Recurrent seizures.

→ Clinical manifestations

* Dysphagia → Rabies

① Altered level of consciousness

② Seizure → Convert from type to other
→ Not respond to treatment.

③ Neuro deficit

④ Behavior / personality change.

1, 4 → MC

* CSF For Viral E. :

opening pr. →	Normal/high
Color →	Clear
WBC →	5-1000
glucose →	Lymphocytes
protein →	Normal
	Mildly raised (0.5 to 1)

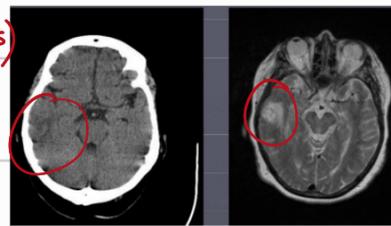
* HSV Finding → Skin (Herpetic lesions)
 encephalitis s/s → Eye (Keratoconjunctivitis)
 Disseminated disease → Mouth (Oropharyngeal involvement)

* Investigations.

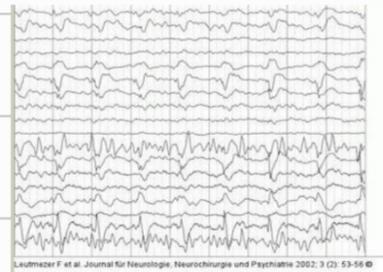
→ Mainly → ① LP (CSF analysis) (For diagnosis)
 ② Neuroimage → CT (Herpes encephalitis)

For all suspected pt. → perform **no** ↑ ICP by fundoscope/CT
 culture → pleocytosis (lymphatic if viral)
 PCR (100% specific to HSV) → ↑ protein / Glucose normal or ↓
 RBCs (in HSV)

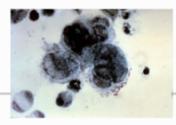
③ EEG → in HSE ⇒ (paroxysmal lateral epileptiform discharges) (PLEDs)



- * Others :
- ① CBC
 - ② electrolyte
 - ③ KETILET
 - ④ glucose
 - ⑤ Coagulation



* For specific viruses :-



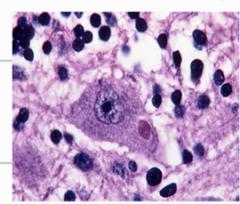
HSV ⇒ Tzanck smear / Serology / viral cultures / PCR

Arbo → Complement fixation AB

* Brain Biopsy →

EBV → Heterophile AB / Cold agglutinin test

(Negri bodies → pathognomonic for Rabies)



* Treatment.

→ Supportive (Monitor for 24-48 hrs)

ICU admission / Aggressive therapy for seizure

→ HSV → IV Acyclovir (10-20 mg/kg/dose q8hr) 14-21 days

↓ severity of neurological sequelae
 life saving!

→ HIV → Anti-Retroviral (Zidovurdin/ didanosine).

* Subacute Sclerosing panencephalitis (SSPE) or Dawson's inclusion body encephalitis.

→ Def: Progressive neurodegenerative disease caused by persistence of measles infection or vaccine! (after 7-16 yrs after infection)

→ Clinical course

* Gradual, progressive psychological deterioration
(Behavior change → Cognitive impairment → Jerky)

→ Diagnosis

DYKEN'S MODIFIED CRITERIA	
MAJOR	MINOR
Clinical history	Typical EEG
Elevated CSF measles antibody titres	Increased CSF immunoglobulin G (IgG)
	Brain biopsy
	Special molecular diagnostic tests to identify measles virus mutated genome
2 Major + 1 Minor Criteria	

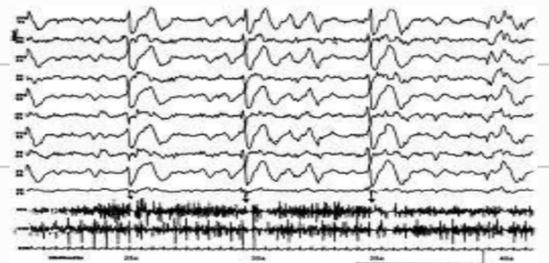
* to know if there was previous infection → Do serum AB for measles
→ if +ve Do CSF AB to know if it affect the brain.

* EEG ⇒ Diagnostic (periodic slow wave complex)

(Radermecker complex)

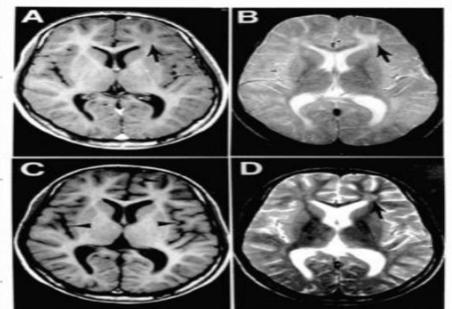
* CT / MRI

→ Cortical atrophy
→ ventricular enlargement



* Treatment

→ inosine pranobex (Anti-viral)
100mg / kg / 2hrs. ⊕ interferon.



* Death within 3yrs (vegetative State! ; vegetative → أضر عيني بطن State! ;)

* Acute Disseminated Encephalomyelopathy (ADEM)

→ Rare, monophasic, inflammatory, demyelinating disease that affect the entire CNS.

→ The most common identified immune mediated encephalitis

→ preceded by URTI (3ws)

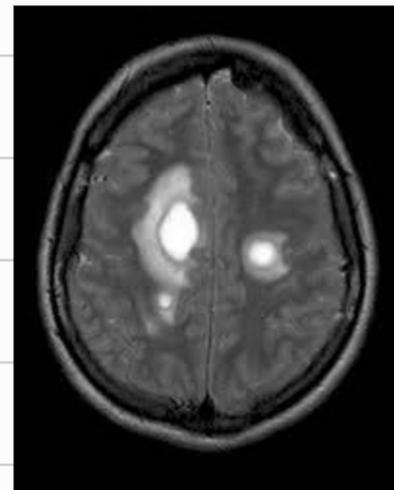
* Clinical features: fever, headache, sleepiness,

Behavior change, acute onset multifocal sensory, motor deficit.

* Diagnosis → MRI / LP (marked polymorphonuclear pleocytosis, ↑ protein, Normal glucose)

* Treatment

- 1st line therapy: High dose IV Corticosteroids. (methylprednisolone)
- 2nd line therapy: Intravenous IG.
- Still no response: Plasma Exchange.



	ADEM	MS
AGE	<10 years	>10 years
Encephalopathy	Present (LOC)	Absent (the attack occur directly)
Prognosis	Recovery is rapid and often complete	Recovery variable
ON(optic neuritis)	bilateral	unilateral
MRI lesion	Cortical and deep grey matter lesions (diffuse bilateral symmetrical lesion)	Periventricular /callosal lesion (black holes)
CSF	lymphocytosis	Intrathecal IgG
Follow-up MRI	No new lesion	New lesion (episode)

* Autoimmune Encephalitis

→ Group of neuropsychiatric disorder → More in female !!

→ triggered by infection, vaccine, occult neoplasm. ^{→ HSV}

* Autoimmune AB abs neurological s/s: ^{↳ most frequently abs} with **Ovarian teratoma**

N-Methyl D-Aspartate Receptor (NMDAR, NR1, 2)
↳ mainly in pediatrics / Best characterized AE

* The most common presentation in children →

Abnormal behavior, ↓ level of consciousness

Autonomic instability, Hypoventilation.

* Diagnosis

① EEG → **Extreme Delta brush**

② MRI → Hyperintensities in cortical subcortical, basal ganglia ...

③ Auto-AB in both serum, CSF (more sensitive)



In AE, CSF may be normal or abnormal, and in these cases, mild elevation of protein (<100 mg/dl) is the most common finding. A minority has a mild lymphocytic pleocytosis (<100 white blood cells/ μ L) or marked elevation of proteins

Treatment →

① Acute → 1st line → High dose corticosteroid 30mg/kg/day

→ 2nd line → IVIg

Rituximab ± cyclophosphamide → plasma exchange.

② Chronic → Mycophenolate mofetil, AZA → only consider

* prognosis → Good

↳ relapse.

in case of known risk for relapsing!