An Approach to Acute Febrile Confusional State

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Discussion points

- What is this?
- Causes
- Presenting features
- Investigations
- Emergency Management
- Summary

Introduction

- The inability to think with normal speed and clarity
- Part of Organic Brain Syndrome

:Defines group of cognitive disorders secondary to

- CNS disease
- Systemic diseases
- Substance-related disorders

Organic brain syndrome

Global Cognitive impairment:

- **Behavior and Emotion**
- **Judgment**
- **Language**
- **Abstract thinking**
- **Psychomotor activity**

Confused States

- Delirium
  - **Acute (hours to days)**
- Dementia
  - **Chronic (months to years)**

Table 8.2 Clinical features of acute confusional state, dementia and acute functional psychosis

Characteristic	Acute confusional state	Dementia	Acute functional psychosis
Onset	Sudden	Insidious	Sudden
Course over 24 h	Fluctuating, nocturnal exacerbation	Stable	Stable
Consciousness	Reduced	Clear	Clear
Attention	Globally disordered	Normal, except in severe cases	May be disordered
Orientation	Usually impaired	Often impaired	May be impaired
Cognition	Globally impaired	Globally impaired	May be selectively impaired
Hallucinations	Usually visual or visual and auditory	Often absent	Predominantly auditory
Delusions	Fleeting, poorly systematized	Often absent	Sustained, systematized
Psychomotor activity	Increased, reduced or shifting unpredictably	Often normal	Varies from psychomotor retardation to severe hyperactivity
Speech	Often incoherent, slow or rapid	Difficulty finding words, perseveration	Normal, slow or rapid
Involuntary movements	Often asterixis or coarse tremor	Often absent	Usually absent
Physical illness or drug toxicity	One or both present	Often absent	Usually absent

Reference: Lipowski ZJ. Delirium in the elderly patient. *New England Journal of Medicine* 1989; **320**: 578–82.

Delirium

- Metabolic/ Toxic Encephalopathy
- **Infections**
- **Inflammatory**
- Up to about 20% ED patients
- Predominance in elderly

Predisposing factors

1. Age > 60 years
2. Heavy dependence on drugs/alcohol
3. History of brain damage due to trauma/CVA
4. Metabolic/electrolyte disturbance
5. Recent surgery

Pathophysiology

- Widespread alteration in cerebral metabolic activity
- Dysregulation in neurotransmitter synthesis and metabolism

- ↓↑Acetylcholine transmission
- ↓Serotonin (sepsis and hepatic encephalopathy)
- Lack of substrates(Glucose & O2)
- Electrolyte disturbances
- Changes in temperature(changes in cerebral metabolic rate, affecting enzyme activity)

Causes of delirium
I watch Death

- I nfections
- W ithdrawal
- A cute metabolic
- T rauma
- C NS
- H ypoxia
- D eficiencies
- E nviromental
- A cute Vascular
- T oxin
- H eavy metal

… It's the bug

- Intracranial

1. **Meningitis (viral,bacterial,Tubercular)**
2. **Encephalitis**
3. **Intracerebral abscess**
4. **Cerebral malaria**
5. **Severe Typhoid**
6. **Parasites**
7. **Fungus**

- Extracranial

1. **Pneumonia**
2. **Urosepsis**
3. **Biliary tract Sepsis**
4. **Skin infection**
5. **Otitis Media**
6. **Septicaemia**

Secondary Involvement of Brain

Causes of febrile confused Patient

1. **Viral: Dengue, CMV, HSV**
2. **Bacterial: Salmonella – severe Typhoid**
   Pneumococci - severe pneumonia
   Brucella - Neurobrucellosis
3. **Spirochetae –Laptospira**
   Nerosyphilis
4. **Protozoa –**
   Malaria – mainly falciparum malaria
   Naegleria,acanthoaemeba- meningoencephalitis
   Toxoplasma-
5. **Fungi – Cryptococcus neoformans causes meningitis in immunosuppressed person**

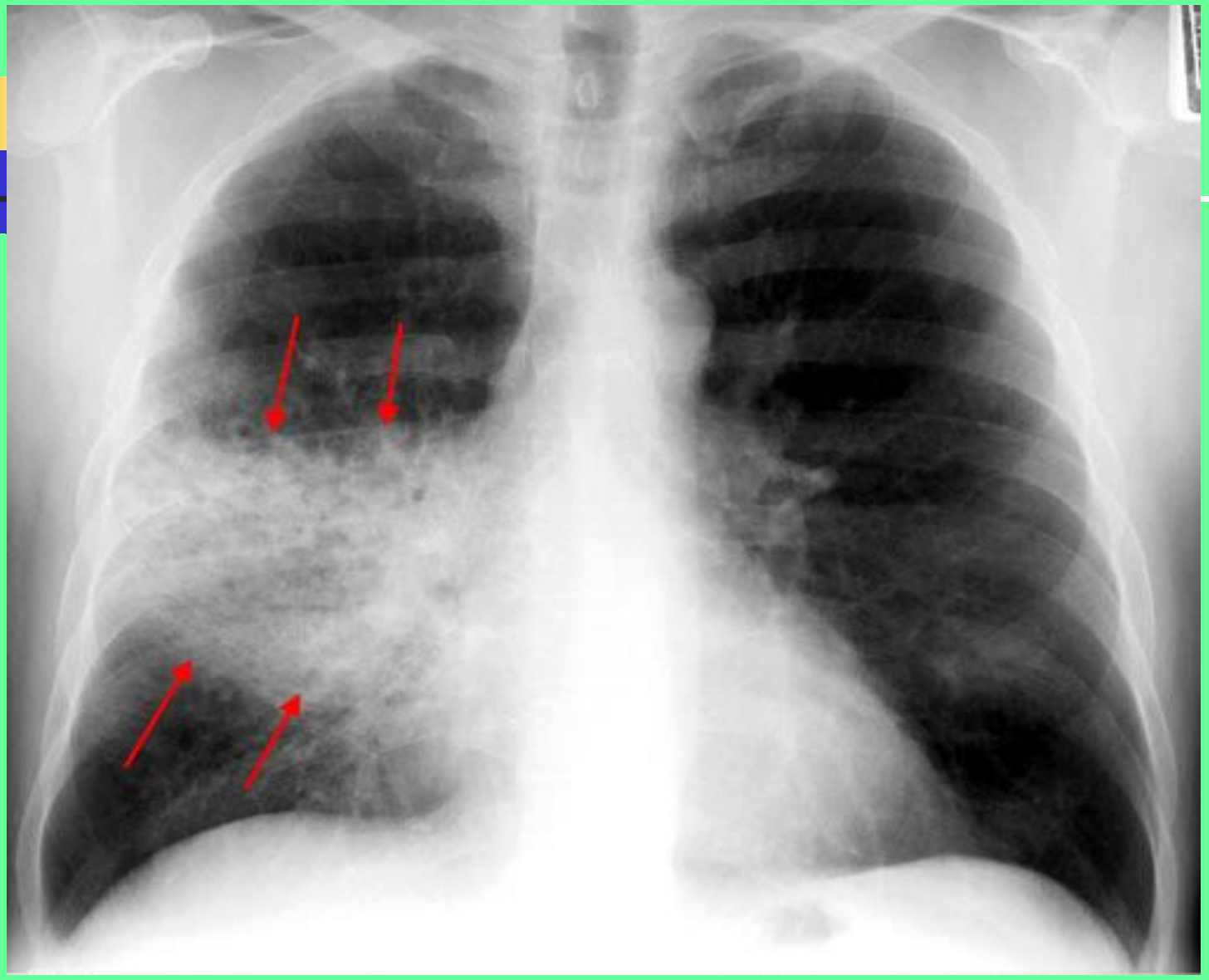
Causes of Febrile Confused Pt

Others: infection with metabolic/ endocrine derangement:

- **diabetic keto-acidosis**
- **non-ketotic diabetic coma**
- **Addison's disease/ panhypopituitarism**
- **hepatic encephalopathy**
- **respiratory failure**
- **renal failure**
- **thyrotoxic crisis, myxaedema madness**
- **hypothalamic disorders**
- **porphyria**
- **vasculitis e.g. SLE/ thrombocytoma leading to he**
- **Lymphoma, leukomia, other tumour with CNS secondaries**

Prominent feature in any systemic infection

- Very young,
- Elderly and
- Immunocompromised



Related to overdose, withdrawal or idiosyncratic reaction to medication

- 22-36% of elderly cases of delirium

Anticonvulsants
Antihistamines
Cimetidine
Clonidine
Corticosteroids
Digitalis
NSAIDs
Levadopa
Propranolol
Reserpine
Thyroid hormones

Sedative-hypnotics
Antidepressants
Barbituates
Neuroleptics
Diuretics
Theophylline
Antiemetics
Antispasmodics
Antibiotics, antivirals
Salicylate
Ocular cycloplegics and mydriatrics

Narcotics
Muscle relaxants
Methotrexate
5-Fluorouracil
Interferon
Cyclosporin

Poisons

- Self ingested (insecticide, cyanide)
- Dhatura
- **Alcohol**
- Car fumes in an enclosed area (carbon monoxide)
- Industrial chemicals (lead, mercury, hydrogen sulphide)
- Trichloroethane and Trichloethylene
- Foxglove, Jimsonweed, Nutmeg

Presenting features

Non specific Prodormal Symptoms → Anxiety, Restlessness, Insomnia | Progress over hours to days

Global impairment of cognitive function

Clinical history

Need for collaborative history from relatives and friends

1. **Easily distracted**
2. **Disorientation to time, place, person**
3. **Short term memory loss**
4. **Preservation of long term memory**
5. **Disorganization of thought processes**

Clinical history

6. Delusion and hallucination
7. Emotional lability
8. Reversal of sleep-wake cycle
9. Impairment of functional status

After initial assessment of vital signs and resuscitation take history from attendants regarding:

- Onset and duration of illness:

  Sudden onset—Pontine hge

  Over hrs---Viral encephalitis, Addison's crisis, hypopituitarism

  Over days—bacterial infection

  Weeks to months—Tuberculosis,CNS lymphoma

- Fever character:

  low grade- tuberculosis

  high grade continued- bacterial infection, malaria

  high swinging temp- abscess, malaria

- History of recent travel:

to malaria endemic zone/ is the pt from malaria endemic zone/ is there any contact with sputum positive TB patient?

Find out the Clues----

- History regarding focus of infection

1. **Ear-ache/discharge from ear/sinusitis—may lead to meningitis**
2. **Infection of gum/lips—may lead to cerebral venous sinus thrombosis**
3. **Cough,sputum production, hemoptysis, chest pain—history suggestive of TB, pneumonia, bronchiectasis**

Find Out the Clues

- known case of vulvular heart disease –infective endocarditis leads to brain abscess
- Any urinary complaints –UTI may leads to septicaemia
- Abdominal pain/RUQ pain—liver abscess may give rise to brain abscess or septicemia
- History of iv drug abuse—infective endocarditis may lead to cerebral abscess
- History of diabetes, thyroid disease, disease of adrenals, leukemia, lymphoma, CLD
- Drug history—steroid/other immunosuppressive
- Epidemic outbreak of disease like –NIPAH, SARS, JAPANESE, FLU etc

Physical findings

- **Ensure adequacy of ABCs**
- **Febrile ?**
- **Targeted clinical examination**
- **GCS and Neurological examination**
- **Mental state examination**

Important Physical Sign

1. Skin condition- is there any rash/bruising/ bleeding
   - **Meningococcal septicaemia/DIC/Dengue/SLE/Leukemia**

2. eyes-pupils-
   - **Constricted-pontine h'ge**
     Unequal
     Dilated
   - **Fundi- Papilloedema- features of raised ICP**
   - **Choroid tubercle- milliary TB**
   - **Roth's spot- infective endocarditis**
   - **Cytoid body- SLE**
   - **Choroidoretinitis - toxoplasmosis**

Important Physical Sign

3.Neck rigidity- Meningitis

Meningoencephalitis

Brain abscess

4.Lymphadenopathy- leukaemia/lymphoma– immunosuppressive condition predisposes to septicaemia

5.Heart murmur- infective endocarditis(IE)

6.Chest-features of consolidation,

7.Splenomegaly/ hepatomegaly – malaria/leukaemia/ lymphoma/IE

8.Perianal region - abscess

Important Physical Signs-contd..

9. PV/pelvic examination– postpartum/retained placenta/criminal/septic abortion--septicaemia
10. DRE—collection at pouch of Douglus
11. Jerks and plantar response

Toxidromes

Constellation of signs and symptoms characteristic of drug intoxication

- **Anticholinergic poisoning(fever, flushing, dry mucous membrane, tachycardia and delirium)**
- **Narcotic overdose(Bradycardia, miosis, lethargy)**

Confirmation: reversal of symptoms with antidotes

Mental state examination

Assessment of

- **Orientation** (Unable to recall date, day of week, month and year, place, lastly self/ person)
- **Memory**
- **Attention**
- **Concentration**
- **Constructional tasks**
- **Spatial discrimination**
- **Arithmetic ability**
- **Writing**

Bedside cognitive testing

Limitation of tests:

- **Very mild degree of cognitive impairment missed**
- **Affected by patient's education level and general intelligence**
- **Reflects patient's cognitive function at one point in time**

Pre hospital Management

- Initial ABC assessment
- Trauma- cervical neck immobilization
- GCS and quick CNS exam
- O2supplementation
- Check RBS
- IV Access for fluids and meds
- History of medications/ alcohol use
- Monitoring

Emergency Management

1.Re-assess ABC
2.Oxygen and IV fluids
3.Re-check RBS
Hypoglycaemia: correct with Concentrated Dextrose solution
- IM glucagon

4. Supportive care

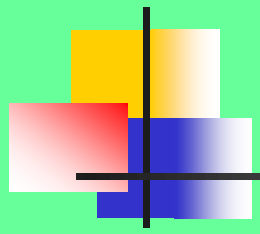
Supportive care

- **appropriate environment with adequate lighting**
- **minimize sensory input (spectacles, hearing aids)**
- **area that can be supervised by staff**
- **address patient by name**
- **stretcher sides must be up**
- **Physical restraint as last resort**

Emergent Diagnostic Tests

- RBS
- FBC- Infection, Anemia, Leukemia, TTP
- PBF—blast cells in leukaemia Fragmented red cells and low platelet—DIC
- Thick and thin film—malarial parasite
- ICT for malarial parasite
- Blood culture—septicaemia
- Serum electrolytes, Ca+
- Chest –xray: Elderly with fever & occult infection
- ECG- AMI and arrhythmia

Emergent Diagnostic Tests



- LFTs- Bil and AST/ALT ,ALP, Prothombin time, GGT
- ABG- Ketosis (DKA & alcohol), lactate (hypotension), ethylene glycol, salicylate, methanol
- Renal function tests
- Thyroid function tests
- CT head- Trauma (SDH, SAH, cerebral contusion), mass lesions, toxoplasmosis, Infarction
- CSF -Meningitis/Encephalitis (cell count, protein, glucose, gram stain, AFB, ADA, India ink,VDRL, C/S), SAH(2-10%)
- MTB PCR/RCP for HIV or other viral infection
- Echo—vegetation and abscess in the heart valves
- Auto antibody—ANA/ANCA, pANCA/Anti phospholipid antibody to find out SLE and other vasculitis.

Emergency Management

Specific treatment

Acute meningitis	IV Antibiotic, antiviral, + steroids
Overwhelming sepsis	to start in HDU
Encephalitis	IV antiviral
Cerebral Malaria	IV antimalarial
Parasites	IV according to suspicion
TCA Overdose	IV $NaHCO_3$
Ethylene glycol	IV ETOH infusion
OP overdose	IV Atropine infusion with pralidoxime
Carbon monoxide	Hyperbaric oxygen therapy
Anticholinergic overdose	IV Physostigmine
Hyperthermia	BCU therapy

Other examples

1.Alcoholics: IV thiamine 100mg before Dextrose

Prevent Wernicke's encephalopathy

2.Narcotic overdose: **Naloxone IV 10 mg**

3.Benzodiazepine overdose: **Flumazenil IV**

Pharmacological therapy

- Cornerstone of behavioral management
- **Antipsychotics and benzodiazepines**

- **Haloperidol :**Potent dopamine blocking medication
- No anticholinergic or hypotensive effects
- IV administration at 2-5 mg increments at 30 minutes
- Synergistic effect with IV lorazepam
- S/E extrapyrimidal :parkinsonism symptoms
  (overcome with benzodiazepine)

Emergency Management

Midazolam:

Drug of choice for alcohol withdrawal (delirium tremens)
For withdrawal from sedative hypnotic
Start at IV 2-3 mg
Titrate to effect

Legal considerations

1. **Implied consent:** appropriate in true emergency exist

   Render treatment without informed consent to an incompetent person in a life threatening emergency situation

2. In urgent situations where treatment is required but not life threatening

-Get family involved in evaluation and treatment process

-? Need for 2nd opinion

- **Document all proceedings and discussions (esp with family members and other healthcare professionals)**

Summary

- **Acute confusional State is a medical Emergency**
- **It increases morbidity, mortality and prolongs hospital stay.**
- **Presence of Fever implies infection or inflammation as underlying primary disease or precipitating factor.**
- **Prompt diagnosis and optimum early management may be life saving**

Thank You