An Approach to Acute Febrile Confusional State

Prof Md Azizul Kahhar
Professor of Medicine
Dhaka Medical College
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>
<thead>
<tr>
<th>Characteristic</th>
<th>Acute confusional state</th>
<th>Dementia</th>
<th>Acute functional psychosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Sudden</td>
<td>Insidious</td>
<td>Sudden</td>
</tr>
<tr>
<td>Course over 24 h</td>
<td>Fluctuating, nocturnal</td>
<td>Stable</td>
<td>Stable</td>
</tr>
<tr>
<td>exacerbaration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consciousness</td>
<td>Reduced</td>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>Attention</td>
<td>Globally disordered</td>
<td>Normal, except in severe cases</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>Usually impaired</td>
<td>Often impaired</td>
<td>May be impaired</td>
</tr>
<tr>
<td>Cognition</td>
<td>Globally impaired</td>
<td>Predominantly auditory</td>
<td></td>
</tr>
<tr>
<td>Hallucinations</td>
<td>Usually visual or visual and auditory</td>
<td>Often absent</td>
<td></td>
</tr>
<tr>
<td>Delusions</td>
<td>Fleeting, poorly systematized</td>
<td>Often absent</td>
<td>Sustained, systematized</td>
</tr>
<tr>
<td>Psychomotor activity</td>
<td>Increased, reduced or shifting unpredictably</td>
<td>Often normal</td>
<td>Varies from psychomotor retardation to severe hyperactivity</td>
</tr>
<tr>
<td>Speech</td>
<td>Often incoherent, slow or rapid</td>
<td>Difficulty finding words, perseveration</td>
<td>Normal, slow or rapid</td>
</tr>
<tr>
<td>Involuntary movements</td>
<td>Often asterixs or coarse tremor</td>
<td>Often absent</td>
<td>Usually absent</td>
</tr>
<tr>
<td>Physical illness or drug toxicity</td>
<td>One or both present</td>
<td>Usually absent</td>
<td></td>
</tr>
</tbody>
</table>

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

- Infections
- Withdrawal
- Acute metabolic
- Trauma
- CNS
- Hypoxia
- Deficiencies
- Environmental
- Acute Vascular
- Toxin
- Heavy 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 –Laptoxia
   Nerosyphilis
4. Protozoa –
   Malaria – mainly falciparum malaria
   Naegleria, acanthoameba- 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, leukemia, 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

<table>
<thead>
<tr>
<th>Anticonvulsants</th>
<th>Sedative-hypnotics</th>
<th>Antidepressants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antihistamines</td>
<td>Barbituates</td>
<td>Neuroleptics</td>
</tr>
<tr>
<td>Cimetidine</td>
<td>Diuretics</td>
<td>Theophylline</td>
</tr>
<tr>
<td>Clonidine</td>
<td>Antiemetics</td>
<td>Antiemetics</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>Antispasmodics</td>
<td>Antibiotics, antivirals</td>
</tr>
<tr>
<td>Digitalis</td>
<td>Salicylate</td>
<td>Ocular cycloplegics and mydriatics</td>
</tr>
<tr>
<td>NSAIDs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levadopa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propranolol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserpine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid hormones</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Anxiety
- Restlessness
- Insomnia

Progress
- over hours
- to days

Non-specific Prodromal Symptoms

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—inf ective 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 – immuno-suppressive 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 Douglass

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
Prehospital Management

- Initial ABC assessment
- Trauma - cervical neck immobilization
- GCS and quick CNS exam
- O2 supplementation
- 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, Prothrombin 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 NaHCO3
- 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)
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