Altered Mental Status (AMS) — Emergency Assessment and Treatment

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Altered mental status (AMS) is a common presentation to the emergency department. The condition comprises a group of clinical symptoms rather than a specific diagnosis. Patients with AMS present with cognitive, attention, arousal, or consciousness disruption. To understand emergency medicine, it is important to gain an essential understanding of AMS.

Definition

Altered mental status (AMS) refers to a clinical entity of altered brain function ranging from mild confusion to lethargy, delirium, amnesia, dementia, encephalopathy, and organic brain syndrome.

Epidemiology

The symptomatic diagnosis of AMS is quite common in the emergency department (ED). Up to 1% of individuals presenting to the ED complain of AMS. The male-to-female ratio is 1:1. Most patients with AMS are older than 60 years, 36% are younger than 40 years, and 22.5% are between 40 and 60 years old.

The age distribution of AMS shows 2 distinct peaks in incidence: 1 at 33 years of age and

another at 72. The etiology of AMS differs depending on the age of the patient.

AMS in the elderly is considered to be an alarming presentation. Because of this, up to 43% of those with AMS arrive at the ED by ambulance. Only 20% of those with AMS arrive at the ED on foot, and most of these patients are younger and usually have a non-life-threatening cause for their AMS.

Patients with an altered mental status do not necessarily have a decreased level of consciousness.

Classification

AMS can be classified into 3 main categories:

Central nervous system inhibition	Patients can present with confusion, drowsiness, decreased level of consciousness, or coma.
Central nervous system stimulation	Patients might present with irritability or aggressiveness.
Abnormal behavior	Patients might present with hallucinations.

Up to 53% of patients with central nervous system inhibition are found to have a Glasgow Coma Scale score of < 15 and are difficult to arouse. They may be disoriented vis-a-vis time, space, and person. They can have a diminished response to verbal or physical stimulation. Twenty-seven percent of these patients can present with confusion, and 21% are unable to remain awake. Patients with central nervous system stimulation or abnormal behavior may also present with inappropriate, bizarre behavior (9%) or hallucinations (7%).

Emergency Assessment

When a patient presents to the ED with AMS, it is imperative to try to determine the cause of the condition. **The main goal of the emergency assessment of AMS, therefore, is to formulate a causative diagnosis.**

Clinical history taking is an essential skill in the assessment of a patient with AMS. The cause of AMS can be determined by a patient's history alone in up to 40% of cases. Medication history and previous medical history should be explored in all patients presenting with AMS. Physical examination should be complete and thorough, as it can reveal the cause of AMS in up to 21% of cases. A trial of treatment can be also useful in determining the cause of AMS, especially when drug toxicity is suspected. Unfortunately, a complete assessment of AMS can reveal a clear cause in only 60% of cases.

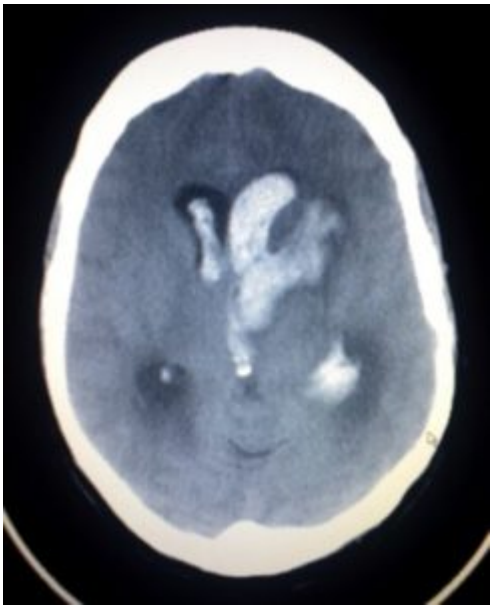

Image : "An intracranial hemorrhage, one cause of altered level of consciousness" by Glitzy queen00.
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Imaging studies are also useful in determining the cause of AMS in the ED. A brain computed tomography (CT), for instance, may reveal an acute hemorrhagic stroke. Electrocardiography should be also used in the assessment of AMS. Arterial blood gas and blood chemistry are 2 useful laboratory tests. A urinalysis should be obtained when sepsis is suspected.

Coagulation studies should be obtained in patients suspected to have a hemorrhagic stroke; however, coagulation studies were found to be noncontributory to the causative diagnosis approach in the assessment of AMS. Electroencephalogram alone can determine the cause of AMS in up to 1% of cases.

When imaging, electrophysiological, laboratory, and clinical assessment tools are used together, the cause of AMS can be determined in up to 94.7% of cases.

Etiologies

As noted, the cause of AMS can be identified in up to 94.7% of cases if a systematic approach is followed when assessing the patient. Causes of AMS can be physical, psychological, or environmental.

The most common causes are:

- Cerebrovascular disease
- End-organ dysfunction
- Sepsis (10% of cases of AMS in the elderly)
- Drug toxicity (most common cause in the middle-aged and young patient)

Neurological causes of AMS include:

- Cerebrovascular disease
- Traumatic brain injury
- Encephalitis
- Seizure-related disorders
- Intracranial tumors

- Hypo-/hyperglycemia
- Hypoxia
- Dehydration
- Thyroid abnormalities
- Urinary tract infection

Limbic encephalitis and anti-NMDA receptor encephalitis are rare and unclear causes of AMS.

Emergency treatment

Most patients with AMS are treated at the ED successfully and discharged home (28%). Up to 5% of AMS patients are admitted to the critical care unit for intensive care treatment after triage and before entering the ED. Of those who do present to the ED, another 26% also end up in the critical care unit.

Patients who go to the critical care unit immediately after triage had an average length of hospital stay of 3.8 days, which can indicate a worse prognosis and higher mortality.

Tracheal intubation is indicated for patients with AMS who need treatment in the intensive care unit. The estimated mortality rate of AMS patients is approximately 8%. Most deaths occur in the ED before a patient is admitted to the hospital.

Suggested algorithm for the management of AMS

Step 1

The first step of the management of an AMS case is to **secure the airway, breathing, and consciousness.** If the patient is unstable, they should be admitted to the critical care unit for circulatory monitoring, and ventilation or circulation support should be considered. If the patient is found to be stable, it should be determined if they are combative or cooperative before treatment begins.

Step 2

Combative patients should **receive some form of physical restraint.** Once a patient is found to be cooperative, however, oxygen administration should be started at a dose of 5–10 L/min. An intravenous line should be inserted at this stage and a complete blood count, serum glucose, electrolytes, hepatic, and renal function tests should be ordered. A bolus dose of intravenous glucose should be administered. If the patient is suspected to be an alcoholic, a bolus dose of thiamine is indicated. Naloxone should be administered at this stage if opioid toxicity is suspected.

If the patient improves after this step, especially after the administration of glucose, hypoglycemia should be excluded. Further ED observation is all that is needed at this stage. If the improvement occurred after the administration of naloxone, opioid toxicity is confirmed.

Step 3

If no improvement is observed after step 2, a **reevaluation step should be started.** Arterial blood gas measurement should be ordered to exclude metabolic derangements and respiratory failure. If respiratory failure or shock is confirmed with arterial blood gas measurement, the patient should be admitted to the critical care unit. If metabolic derangements are excluded, proceed to step 4.

Step 4

A brief history should be obtained and a complete **physical examination should be performed.** If a history of head trauma is suspected, an emergency brain CT scan should be performed. Otherwise, a stroke should be suspected and acute stroke evaluation should be started. If the patient does not have any focal neurological deficits and the diagnosis of stroke is unlikely, you should look for symptoms and signs of meningitis. Meningitis can be excluded by a lumbar puncture.

Step 5

At this stage, **neurological causes of AMS should be either confirmed or reliably excluded.** A thorough history should be obtained, and toxicology screening should be started. Systemic organ dysfunction should be excluded. An epilepsy-related disorder can be excluded by an electroencephalogram. Psychiatric consultation may be needed if the cause of AMS cannot be determined.

References

Xiao H, Wang Y, Xu T, et al. Evaluation and treatment of altered mental status patients in the emergency department: Life in the fast lane. World Journal of Emergency Medicine. 2012;3(4):270-277. doi:10.5847/wjem.j.issn.1920-8642.2012.04.006.

Notes