

## Original Research Article

# Etiological analysis, morbidities and mortality that affect the young and middle aged admitted with altered mental status in a general hospital

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## ABSTRACT

**Background:** Authors conducted this study to find the profile of causes and diseases that affect patients of younger age group in altered sensorium admitted in a general hospital associated with Government Medical College Srinagar, in India.

**Methods:** Authors conducted present study over a period of eight months. The patients of young and middle age who were admitted in their hospital ward with altered mental status were included. The study subjects were divided into two groups: group A included patients of age upto 30 years, and group B with patients in age group 31-50 years. The patients were studied for their diagnoses, comorbidities, gender distribution, duration of stay in hospital and mortality patterns.

**Results:** Authors had a total of 112 patients of young and middle age admitted in their hospital ward with altered mental status during the study period. In group A, there were 42 patients or 37.5% (20 males and 22 females). In group B, there were 70 patients or 62.5% (30 males and 40 females). The most common cause of admission in these patients was infection (29.46%) followed by seizures (17.85%) and cardioembolic strokes (11.60%).

The most common comorbidities in studied patients were underlying seizure disorder, psychiatric disease in the form of bipolar affective disorder or schizophrenia, hypertension, type 2 diabetes and chronic kidney disease.

There were 14 deaths in group A and 30 deaths in group B. The most common cause of death was infections followed by seizures, Acute respiratory distress syndrome (ARDS) and severe diabetic ketoacidosis (DKA).

**Conclusions:** The most common cause of admission in young and middle-aged patients in authors' hospital was infection followed by seizures and cardioembolic strokes. The most common cause of death was again infections followed by seizures, acute respiratory distress syndrome and severe diabetic ketoacidosis.

**Keywords:** Encephalopathy, Hypertension, Infections, Middle aged, Stroke

## INTRODUCTION

Altered mental status in young and middle aged can occur due to innumerable causes. Encephalopathy is a nonspecific term that implies the involvement of large parts of the brain or the whole brain, rather than changes confined to parts of the brain. It may thus refer to the clinical findings of altered mental status without any focal findings. The management of such patients in the emergency room should initially be focused on

stabilizing the patient and then searching for the underlying etiology considering neurologic causes, non-convulsive status and many differentials like infections, acute encephalitis, acute meningoencephalitis, prion diseases, hypoxia or anoxia, metabolic problems (like Wernicke's syndrome, delirium tremens or acute alcohol intoxication, dyselektrolytemias, hypo- or hyperglycemia, toxins, drugs, physiologic changes, trauma (including chronic traumatic encephalopathy due to repeated head injuries), and other causes. It can also arise as a

complication of a primary problem such as alcoholic cirrhosis, kidney failure, or respiratory failure. Even, myocardial infarction can present with altered mental status in case of complications like cardiogenic embolism or systemic hypotension.

Such patients can also be described as having confusion or delirium. Confusion presents as the inability to maintain a coherent stream of thought or action. Delirium is a type of confusion with superimposed sympathetic nervous system hyperactivity. Acute encephalopathy is an acute condition of global cerebral dysfunction in the absence of any primary structural brain disease.<sup>1</sup> The patient can present with intellectual disability, irritability, agitation, delirium, confusion, somnolence, stupor, coma and psychosis. As such, the clinical picture of encephalopathy is a myriad of symptoms.

It is clear that the development of stupor and coma portend adverse outcomes; multiple studies have observed that these patients are more likely to die and have poor functional outcomes regardless of underlying etiology.<sup>2-6</sup>

## METHODS

This study was carried out over a period of eight months. It is a prospective type of hospital-based study. All those patients of young and middle age who were admitted in authors' hospital ward with altered mental status were included.

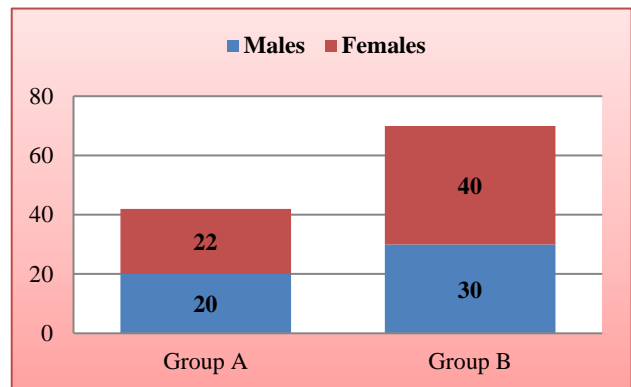
The study subjects were divided into two groups: group A included patients of age upto 30 years, and group B with patients in age group 31-50 years. Thus, authors have excluded those above 50 years of age. A total of 112 such patients got admitted in authors' hospital ward over this study period. The lowest age recorded was 14 years. Studied patients met one of the following criteria: Glasgow coma score <15, socially withdrawn, disoriented with respect to time, person or place, having diminished or absent response to verbal or physical stimuli, somnolent, unable to maintain arousal, hallucinating, confused, or with other abnormal behaviours. These were either acute onset or chronic in present study patients.

Thus, the essential criterion for inclusion was alteration in mental status in those below 50 years of age. In such patients, authors studied the etiology for admission, proportion of mortalities, sex and age variation of morbidities and mortalities. Authors did not have any exclusion criteria in studied patients who met above particulars.

The patients were studied for their diagnoses, comorbidities, gender distribution, duration of stay in hospital and mortality patterns. Comorbidities included the conditions that were present in the patient before present illness or admission.

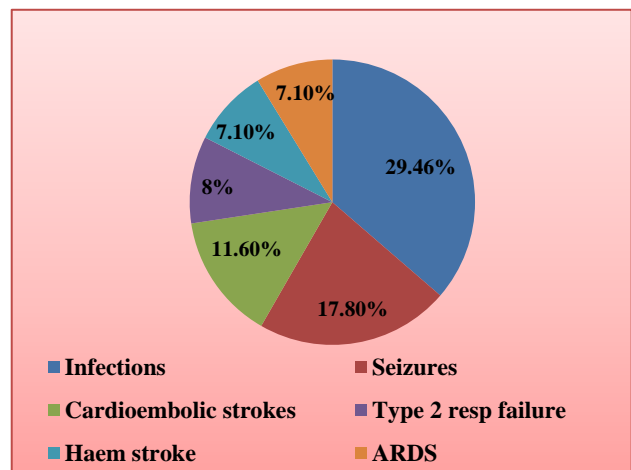
## RESULTS

A total of 112 patients of young and middle age were admitted in authors' hospital ward with altered mental status during the study period. In group A (Figure 1), there were 42 patients or 37.5% (20 males and 22 females). In group B, there were 70 patients or 62.5% (30 males and 40 females). Thus, males comprised 44.64% and females 55.35% of subjects. Total mortality was 39.28%. The most common cause of admission in these patients was (Figure 2) infection (29.46%) followed by seizures (17.85%) and cardioembolic strokes (11.60%).



**Figure 1: Age and gender distribution of study subjects.**

Among infections, aspiration was the leading cause (in 22 patients) followed by tubercular meningoencephalitis (in 9), acute gastroenteritis, pneumonias and acute viral encephalitis.



**Figure 2: Causes of admission.**

Other causes of admission included type 2 respiratory failure in 9 patients, haemorrhagic stroke (in 8), acute respiratory distress syndrome (in 8), organophosphorous compound poisoning (in 6 and 3 developed atropine induced psychosis), viral meningoencephalitis (in 6). Dyselectrolytemias were present in 12 patients (hyponatremia in 5, hyponatremia in 1, hypokalemia in

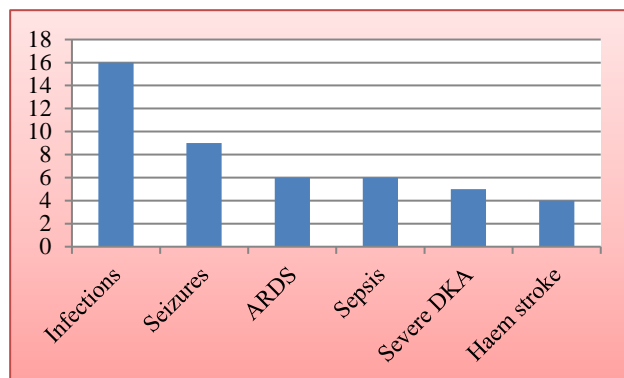
2, and hyperkalemia in 4). Significant drug history was given in 6 patients, commonly selective serotonin reuptake inhibitors and thiazides. Severe diabetic ketoacidosis was present in 5 patients and hypoglycaemia in 4. Four patients were admitted with Wernicke's encephalopathy, 4 had acute kidney injury, 4 had disseminated intravascular coagulation, 4 had severe anemia. Hydrocephalus was present in 3, hepatic encephalopathy in 3, sinus venous thrombosis in 3, uremic encephalopathy in 3, acute on chronic renal failure in 3, three patients survived post cardiopulmonary resuscitation. 3 patients were admitted post lower segment Caesarian section. 1 patient was admitted with deep venous thrombosis of lower limb and 2 developed pulmonary thromboembolism. 3 patients were admitted with acute psychosis (1 with CNS lupus, other with porphyria).

The most common comorbidities in studied patients were underlying seizure disorder (in 28 patients), psychiatric disease (in 9 patients) in the form of bipolar affective disorder or schizophrenia, hypertension (6 patients), type 2 diabetes (6 patients) and chronic kidney disease (6 patients). Other comorbidities included hypothyroidism (in 3), chronic liver disease (in 3), systemic lupus erythematosus (in 3), and 1 each of rheumatic heart disease, Sheehan's syndrome, metabolic syndrome, rheumatoid arthritis, ischemic heart disease, multiple myeloma, lung carcinoma, cerebral palsy with mental retardation, paroxysmal supraventricular tachycardia, type 1 diabetes and post splenectomy state.

**Table 1: Duration of hospital stay.**

	< 1 week	>1 week	Total
Discharged	25	43	68
Expired	29	15	44
Total	54	58	112

Out of 112 patients (Table 1), 25 patients were discharged within 1 week and 43 after 1 week stay. Out of 44 patients who died, 29 remained admitted for less than 1 week and 15 remained for more than a week's time. Out of 112 patients, 34 were intubated, out of whom, 15 died.



**Figure 3: Causes of death in study subjects.**

There were 14 deaths in group A (5 males and 9 females) and 30 deaths in group B (11 males and 19 females). The most common cause of death was (Figure 3) infections (aspiration most common in 16) followed by seizures (in 9), ARDS, sepsis (in 6 each), severe DKA (in 5), intra cerebral haemorrhagic stroke (in 4) and tubercular meningoencephalitis in 4.

## DISCUSSION

The mental status of a person is a combination of his level of consciousness and cognition and patients may have disorders of one or both.<sup>7</sup> Altered mental status is a major symptom of encephalopathy that refers to brain disease, damage, or malfunction. It can present as a very broad spectrum of symptoms ranging from mild, such as some memory loss or subtle personality changes, to severe, such as dementia, seizures, coma, or death. Encephalopathy is thus characterized by an altered sensorium in the form of impairment of cognition, attention, orientation, sleep-wake cycle and consciousness ranging from failure of selective attention to drowsiness.<sup>8,9</sup> Patient can present with myoclonus or asterix (flapping tremor of the hands).<sup>9</sup> Patients often manifest vague symptoms, thus the diagnosis and treatment of altered mental status are highly challenging for emergency physicians. Altered mental status includes cognitive disorders, attention disorders, arousal disorders, and decreased level of consciousness.<sup>10</sup>

Most of the studies regarding altered mental status have been done on elderly population and very few studies exist where younger population has been studied. As per these studies, infections are probably the most common causes of delirium occurring in 16 to 67% of cases; urinary tract infection and pneumonia are common infectious etiologies.<sup>11-18</sup> Current epidemiological studies do not focus much on this state.<sup>19</sup> The most common diagnostic categories causing altered sensorium are primary CNS disorders, intoxication, organ system dysfunction, and endocrine or metabolic diseases. Altered mental status has a high mortality rate and is an important warning signal because of its potentially fatal and reversible effects. Prompt evaluation and treatment are necessary to decreasing morbidity and mortality associated with altered sensorium.

A study showed that the medical history and physical examination are more important than laboratory testing and imaging in the diagnostic evaluation of altered sensorium.<sup>20</sup> So, much emphasis should be put on history and examination even in the emergency room. A recent study by Koita J et al, considered neurological events as the most important factors that account for about 28% of altered mental status patients.<sup>21</sup>

As per the study done by Hustey FM et al, and Kanich et al, 5% to 10% of emergency department patients have altered mental status, especially among the elderly, and over half of these patients are admitted to the hospital.<sup>22,23</sup>

Advanced age and preexisting cognitive dysfunction are the most consistently identified risk factors for delirium in prospective studies.<sup>24,25</sup>

## CONCLUSION

The most common cause of admission in young and middle-aged patients in authors' hospital was infection followed by seizures and cardioembolic strokes. The most common cause of death was again infections followed by seizures, acute respiratory distress syndrome and severe diabetic ketoacidosis. Due to a high mortality rate and an important warning signal because of its potentially fatal and reversible effects, prompt evaluation and treatment are necessary to decrease morbidity and mortality associated with altered mental status.

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