ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 15, Issue 10, 2022

Online - 2455-3891
Print - 0974-2441

Research Article

EVALUATION OF DELIRIUM IN ELDERLY HOSPITALISED PATIENTS IN A TERTIARY CARE HOSPITAL

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Received: 23 May 2022, Revised and Accepted: 4 July 2022

ABSTRACT

Objective: Delirium is common in older hospitalized patients and may indicate a life- threatening condition, where a prompt and appropriate evaluation is required for assessment and prevention of the disease which should be done at the time of admission and continue throughout the hospital stay. The present study was undertaken to evaluate delirium in elderly (>65 years) hospitalized patients in a tertiary care hospital and to monitor outcome after 1 month.

Methods: This prospective observational study was carried out in the Department of General Medicine of M.K.C.G. Medical College and hospital, Berhampur, Odisha, India from August 2019 to September 2021. After clinical evaluation and diagnosis as delirium patients using (confusion assessment method) score, 50 patients (65 years and above) were selected for the study. Patients with dementia, any psychiatric condition, trauma, intoxication, and poisoning were excluded from the study. They were evaluated for etiology and then followed up for 1 month for outcome.

Results: In this present study of 50 patients, 33 were male and 17 were female. About 64% belong to age group 65–75 years. Most common type of delirium was hyperactive (40%). The most common etiologies were hyponatremia (38%), infection (22%), and cerebrovascular accident (16%). Majority of population had both type 2DM (diabetes mellitus) and HTN (Hypertension) (38%). Overall recovery rate was better in metabolic causes (89.4%), most fatal was uremia followed by intracranial bleed. Lower (Glasgow coma scale) score at the time of admission indicates poor prognosis.

Conclusion: Delirium in elderly patients is a medical emergency which needs prompt diagnosis and evaluation helping the family and physicians for better management with a good prognosis.

Keywords: Delirium, Altered mental status, Confusion assessment method, Glasgow coma scale.

 DOI: http://dx.doi.org/10.22159/ajpcr.2022v15i10.45304. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Delirium is an acute confusional mental state of reduced comprehension, coherence, and capacity to reason.

This is a complex medical disorder associated with high morbidity and mortality among elderly patients. Despite its clinical importance, delirium is often not detected or it is misdiagnosed as dementia or other psychiatric illness [1]. Both delirium and dementia are disorders of cognitive function and are associated with adverse health outcomes. Both conditions are common in general hospitals with about 20% older people presenting in hospital having delirium [2] and 40% of older hospital admissions having dementia. This assessment should allow providers to better understand the etiology of mental status changes and therefore improve diagnostics kills and management [3].

For patients with acute changes in mental status, the emergency department evaluation should focus on searching for the underlying etiology [4]. Altered mental status remains a symptom complex that carries a significant length of hospital stay and mortality [5]. It adds an extra burden to the care givers and family members. The key to management of cases of an acute confusional state lies in recognizing a cause or other contributing illness and alleviating it.

Delirium, a common manifestation of acute brain dysfunction in critically ill patients, is associated with poor short-term outcomes and may result in adverse sequelae years after ICU discharge, and an executive summary on preventable medical injuries commissioned by the American Association of Retired Persons identified delirium as one of six leading causes of injuries associated with hospitalization in patients over 65 years of age [6]. Investigations are not unequivocal or at hand all time and at all places to come to a diagnosis and predict an outcome. The answer lies with the patient [7].

The present study was undertaken with the following aims and objectives which were as follows:

- To diagnose delirium in elderly patients (more than 65 years) admitted in emergency department with altered sensorium,
- To evaluate the etiology of delirium,
- To monitor outcome after 1 month.

METHODS

A prospective observational study was designed and conducted in the Department of General Medicine in MKCG Medical College and Hospital, Berhampur, Odisha, India, for 2 years from December 2019 to September 2021. A total number of 50 patients in the age group of 65 years and above and of both the genders presenting in emergency department with delirium, fulfilling the inclusion criteria, were taken in this study. The study was conducted after the study protocol was approved by the Institutional Ethics Committee (No. 959/Chairman-IEC, M.K.C.G. Medical College, Berhampur-4). Informed consent was obtained from all the patients and the study was done in accordance with the guidelines of the Declaration of Helsinki 2008.

The enrolled patients were diagnosed as delirium using confusion assessment method diagnostic algorithm including the following criteria:

- Acute onset and fluctuating course
- Inattention
- Disorganized thinking

- Altered level of consciousness.
- The diagnosis of delirium needs presence of feature 1 and 2 and either 3 or 4.

Inclusion criteria
Patients above 65 years of age complaining of altered sensorium for duration <7 days were included in the study.

Exclusion criteria
The following criteria were excluded from the study:
- Known cognitive impairment or any psychiatric illness
- Intellectually impaired since long period of time
- Head trauma
- Chronic alcoholic, drug abuser, or any other addiction.

All the 50 patients were subjected to a detailed history, neurological, and systemic examination. The patients were subjected to routine laboratory investigations such as complete blood count, lipid profile, serum sodium, serum potassium, renal function test, liver function test, non-contrast computerized tomography (NCCT) of brain, and ultrasonography of abdomen.

Statistics
Data were entered using Microsoft Excel and exported to SPSS version 17.0.

RESULTS

Out of 50 cases, 33 (66%) were male and 17 (34%) were female. The age and sex distribution of 50 cases are shown in Table 1 and Fig. 1.

Table 2 and Fig. 2 show the number of cases and percentage of different types of delirium. Hyperactive (CAM 1 and 2+3) (n=20, 40%), hypoactive (n=18, 36%) and mixed were found to be (n=12, 24%).

The following pie chart depicts etiological distribution of delirium in this study (Table 3 and Fig. 3).

Hence according to this study, it was found that most common cause of delirium in elderly patients is metabolic (hyponatremia) followed by infection and cerebrovascular accident (CVA).

Table 1: Age and sex distribution of cases

Age in years	Male	Female	Total
65–75	23 (46%)	9 (18%)	32 (64%)
>75	10 (20%)	8 (16%)	18 (36%)

Table 2: Types of delirium

Type of delirium	Number of cases	Percentage
Hyperactive (CAM1 and 2+3)	20	40
Hypoactive	18	36
Mixed	12	24
Total	50	100

Table 3: Etiology distribution

Diagnosis	Number	Percentage
Hyponatremia	19	38
Hypoglycemia	6	12
Infective	11	22
CVA (ischemic)	3	6
CVA (hemorrhage)	5	10
Ketosis	4	8
Uremia	2	4

CVA: Cerebrovascular accident

Serum sodium level in hyponatremia
It was observed that it was most common etiology of delirium among these 50 patients. The value varies from 110 to 135 mEq/L. The distribution of hyponatremia is shown in Table 4 and Fig. 4.

Major associated conditions
Out of 50 participants, 28% were only hypertensives, 18% were only diabetic, 36% had both HTN and Type 2DM, and 18% had no comorbidities. As majority of them had some comorbid conditions, it was found to be a major risk factor (Table 5 and Fig. 5).

NCCT brain
Majority of patients had normal study and second most common was atrophic changes in brain which was more frequent in older age group (>75 years); hence, cerebral atrophy could be a risk factor for development of delirium (Table 6 and Fig. 6).

Etiology and outcome
In the present study, metabolic and infective etiology of altered sensorium showed comparatively good outcome with complete recovery. CVAs due to bleed had poorer resulting in death. The patients who showed good recovery were anticipated to do so on 2nd and 3rd day of admission itself based on clinical examination (Table 7).

Coma score and outcome
According to Glasgow coma scale (GCS) score, the lower the score (3 or 4), the death rate is higher, but it was not specific prognosis

Table 4: Serum sodium level in hyponatremia

Serum Sodium Level (mEq/ml)	Number	Percentage
110–120	9	47
121–130	8	42
131–135	2	10

Table 5: Major associated conditions

Associated condition	Number	Percentage
Only hypertension	14	28
Only type 2 diabetes mellitus	9	18
Both hypertension and type 2 diabetes mellitus	18	36
Dyslipidemia	7	14
CKD	2	4

Table 6: NCCT brain findings

Findings	Number	Percentage
Normal study	20	40
Atrophic changes in brain	11	22
Bilateral periventricular ischemic changes	8	16
Intracranial hemorrhage	5	10
Ischemic infarct	5	10
ICSOL	1	2

Table 7: Etiology and outcome

Diagnosis	Number of cases	I	%	II	%	III	%
Hyponatremia	19	2	10.5	-	-	17	89.4
Infection	11	1	9	-	-	10	90.9
Hypoglycemia	6	-	-	-	-	6	100
Ischemia	3	-	-	2	66.6	1	33.3
Intracerebral bleed	5	4	80	1	20	-	-
Uremia	2	2	100	-	-	-	-
Ketoacidosis	4	1	25	-	-	3	75

I: Death, II: Functional disability, III: Full recovery

Table 8: Coma score and outcome

Outcome	GCS score 3		GCS score 4–8		GCS score >/=9	
	Number of cases	%	Number of cases	%	Number of cases	%
I	3	100	3	30	4	10.8
II	-	-	3	30	-	-
III	-	-	4	40	33	89.1

GCS: Glasgow coma scale

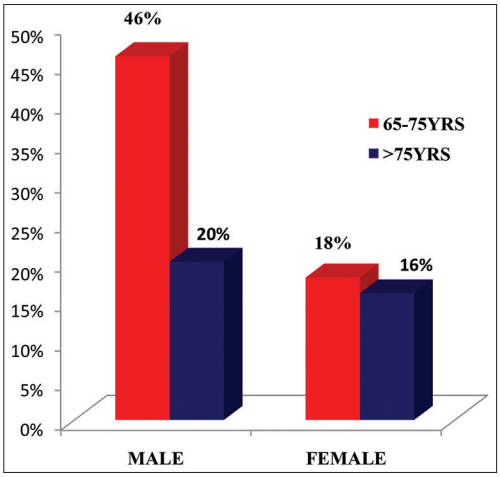

Fig. 1: Age and sex distribution

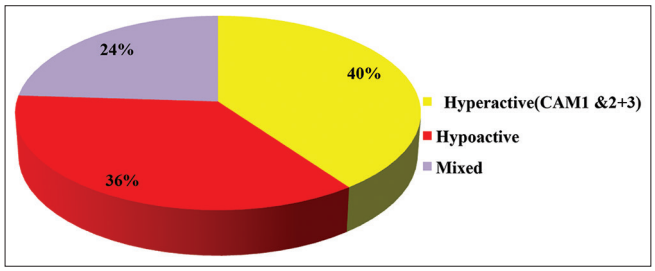

Fig. 2: Types of delirium

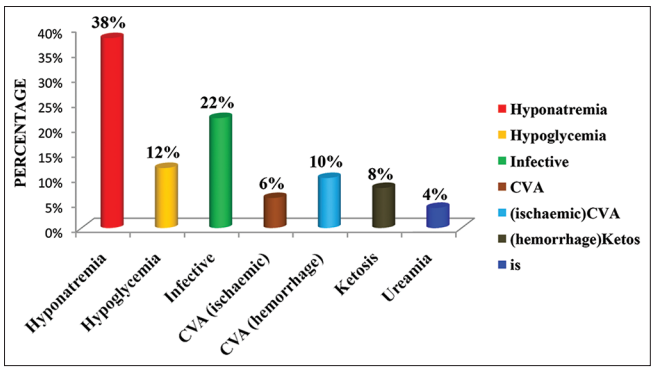

Fig. 3: Etiological distribution of delirium

indicator taken alone. GCS score helped us to know whether pathology is worsening or improving with treatment. Hence, it helped to guide our line of treatment (Table 8 and Fig. 7).

DISCUSSION

In the present study, 50 cases of altered sensorium were evaluated and followed up for 1 month and their outcome was determined. Due to small number of subjects, the results can only be considered as preliminary.

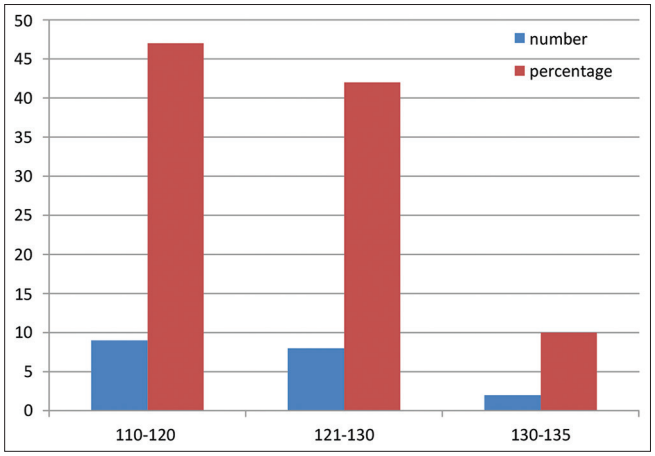

Fig. 4: Distribution of hyponatremia

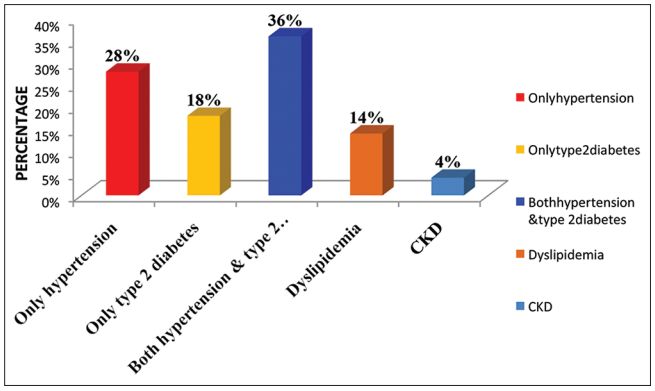

Fig. 5: Major associated conditions

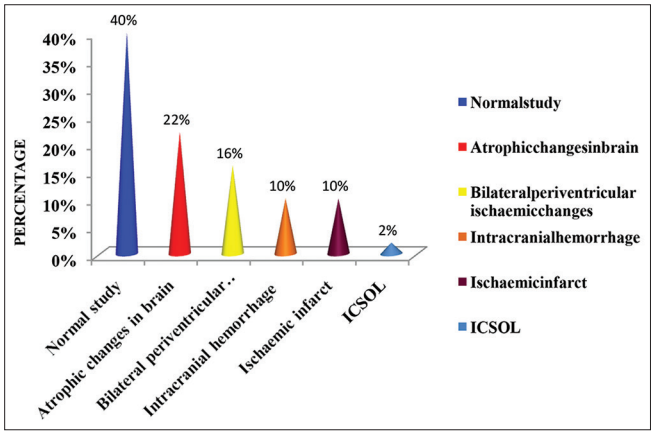

Fig. 6: NCCT brain findings

Out of 50 cases, there were 33 males (66%) and 17 females (34%) giving male-to-female ratio 1.94:1. The maximum number of cases occurred in 65–75 years of age group. The most common type of delirium according

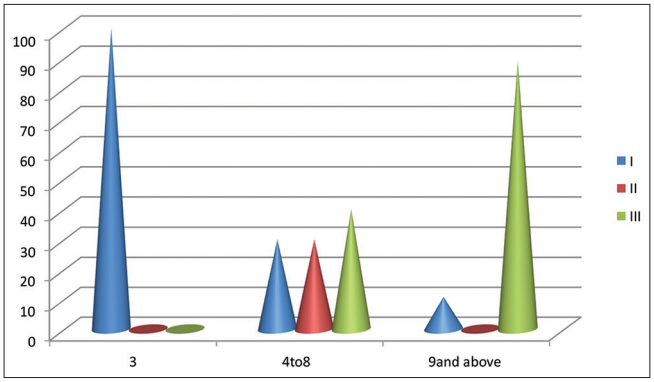

Fig. 7: Graph showing coma score and outcome

to this study was hyperactive (40%) followed by hypoactive (36%). Rahman *et al.* study had 380 patients (>60 years), 256 (67.36%) were male, and 124 were female (32.63%) [8]. Aslaner *et al*. study had 52.3% women and 48.7% men [9].

Etiology

The relative frequency of different disease entities that were responsible for delirium in the present study has been compared with Aslaner Turkey study which had 822 patients [9].

The most common cause of delirium in the present series is hyponatremia (38%), the next in order of frequency is infection (22%). However, in the Aslaner *et al*. study, most common etiology found was infections followed by CVA. Study by Khurana *et al*., in May 2011, on 400 patients having mean age of 70.8 years also found most common etiology as sepsis (44%) followed by metabolic (36%). Most common type of delirium was hypoactive (65%) and hyperactive (25%) [10].

Rahman *et al*. (2016) study showed that causes of delirium were uncontrolled HTN (63.2%), infection (41.6%), uncontrolled DM (36.6%), and CVD (28.4%). CKD (10.5%) [8]. Sumji Setal conducted study showing most common cause CVA (n=161, 25.6%), metabolic (n=157, 24.9%), infections (n=117, 18.5%), seizures (n=83,13.0%), intracranial infections (n= 32, 5%), ICSOL (n =16, 2.6%), poisoning (n=8, 1.3%), SDH (n=9, 1.5%), and unknown (n=17, 2.7%) [11].

JinHH an study showed that most common type of delirium was hypoactive (74%) [12].

Associated conditions

In our study, most common associated condition was coexisting type 2 DM and HTN (38%), only HTN (28%), only Type 2DM (18%), CKD (2.5%). A study by Rai *et al*. mentioned that HTN was the most common (26.92%) associated condition followed by CVA with multiple infarct of four patients [13]. Kaur *et al*. conducted a study and found that ACS was most common associated factor (85%), 19% were hypertensive, 17% had diabetes, CKD in 13%, CLD in 13%, drug abuse in 6%, malignancy 6%, and alcohol 4% [14]. Inouy *et al*. study showed that common risk factor was visual impairment (RR- 3.5), severe illness (RR-2.8), and high BUN (RR-2.0) [15].

Outcome

Out of 50 cases in this study, ten died with overall mortality (20%), functional disability (6%), and moderate to good recovery (74%). Study by Rahman *et al*. showed about 63.7% improved completely, 29.50% had persistent symptoms, and 6.8% of them died. Khurrana *et al*. study showed 14.75% mortality and good outcome 83% [10]. Monidipa Dasgupta, Chris Brymer conducted a prospective study on prognosis of delirium in elderly found that 69% of patients showed poor recovery inform of either death or disability (55 dead, 46 had functional deficit) [16]. A study by Davis *et al*. noted that delirium was associated with general cognitive decline, with an eight-fold increase incident of dementia and accelerated decline in MMSE scores [17]. A study by Grover *et al*. showed that 65.9% improved and 6.6% died. About 8.8% had residual disability [18]. A Turkish study by Kekec *et al*. found 20.1% mortality rate in delirium patients, where total number of patients were 790 [19].

CVA

The presence of any degree of delirium substantially reduces the chance of a good outcome of patients with ischemic stroke and a poor chance of outcome in patients with cerebral hemorrhage. In our study, patients who presented with infarction and delirium not lasting more than 24 h showed good recovery. Oxbury, Greenhall, and Gainger found that any alteration in consciousness with ischemic stroke predicted at least a 30% mortality and the death rate climbed as GCS descended [20].

Septic encephalopathy

Deep stupor or coma in infections such as bacterial meningitis and viral encephalitis carries mortality of 50% or higher. However, attention has to be given to the virulence of the organism and delay in beginning of effective treatment along with neurologic details [21].

Coma score and outcome

The lower the coma scores of three and four, the death rate is more, but it was not a specific indicator of prognosis taken alone. The patient with GCS score of more than six to eight was 7 times more likely to waken than those with a score of three to five. GCS <4 has high mortality. This was seen in a study done by Vangool *et al*. [22]. Thus, GCS helps to predict outcome and identification of comatose patients at high risk for death or severe disability. Patients with abnormal brain stem response, absent verbal response, and absent withdrawal response to pain on day three showed more mortality. A study done on 596 patients by Hamel M. Betal showed the absence of above clinical signs carried poor outcome [23].

CONCLUSION

The present study was focused in determining the cause of delirium in elderly population and to identify minimal data required to make a prediction of outcome in these cases. Quick and accurate diagnosis and thorough evaluation of elderly hospitalized delirium patients had better prognosis in terms of severity, duration of delirium, and mortality.

AUTHORS' CONTRIBUTIONS

The authors declare that all the named authors have contributed equally to this article.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

FUNDING

No funding sources.

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