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INCIDENCE OF DELIRIUM AMONG ELDERLY PATIENTS ADMITTED IN INTENSIVE CARE UNIT

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ABSTRACT

Background: Delirium is a common yet frequently underdiagnosed neuropsychiatric condition characterized by acute and fluctuating disturbances in attention, consciousness, and cognition. It is especially prevalent in critically ill elderly patients admitted to intensive care units (ICUs), and is associated with increased morbidity, prolonged hospital stay, long-term cognitive decline, and higher mortality. Despite its clinical significance, delirium remains under-recognized in many healthcare settings.

Aims: This study was conducted to determine the prevalence of delirium among elderly patients admitted to the ICU

Methods: This cross-sectional observational study was carried out over a period of 12 months in the ICU of a tertiary care medical college hospital. A total of 150 patients aged 60 years and above who were admitted to the ICU for more than 24 hours were enrolled after obtaining informed consent from the patients or their legal guardians. Delirium was assessed using the Confusion Assessment Method for the ICU (CAM-ICU), a validated tool suitable for use in non-verbal or intubated patients. Data were collected on demographic details, clinical diagnoses, comorbidities, laboratory values, medications, use of mechanical ventilation, and sedation.

Results: This cross-sectional observational study was carried out over a period of 12 months in the ICU of a tertiary care medical college hospital. A total of 150 patients aged 60 years and above who were admitted to the ICU for more than 24 hours were enrolled after obtaining informed consent from the patients or their legal guardians. Delirium was assessed using the Confusion Assessment Method for the ICU (CAM-ICU), a validated tool suitable for use in non-verbal or intubated patients. Data were collected on demographic details, clinical diagnoses, comorbidities, laboratory values, medications, use of mechanical ventilation, and sedation.

Conclusions: The mean age of patients was 69.3 ± 6.4 years, with males comprising 61.3%. The most common comorbidities were hypertension (62.7%) and diabetes (51.3%). Delirium occurred in 37.3% of patients, predominantly hypoactive (60.7%), with 75% developing it within 48 hours. Significant associations were found with sedative use, mechanical ventilation, cognitive impairment, and higher APACHE II and SOFA scores. Delirium was linked to longer ICU stay (9.4 vs. 5.8 days) and higher mortality (32.1% vs. 12.8%).

Keywords: Cognitive Dysfunction, Critical Care, Delirium, Elderly, Intensive care unit

INTRODUCTION

Delirium is an acute neuropsychiatric illness marked by variable impairments in attention, consciousness, and cognition. It progresses rapidly, typically within hours to days, and signifies a medical emergency frequently reflective of underlying acute physiological problems.[1] Delirium is notably prevalent in the intensive care unit (ICU), particularly among elderly patients, owing to the severity of disease, multiple comorbidities, and many environmental and iatrogenic causes.[2] The elderly are intrinsically more susceptible to delirium due to age-related alterations in brain function, sensory deficits, polypharmacy, and a greater incidence of cognitive problems.[3]

The incidence of delirium in older ICU patients has been documented to vary between 20% and 80%, contingent upon the patient demographic, ICU environment, and diagnostic standards employed. Despite its widespread occurrence and considerable effect on outcomes, delirium frequently goes unrecognized and is poorly handled in standard clinical treatment.[4] This is mostly because to its variable character, symptom overlap with other neuropsychiatric disorders, and the absence of systematic screening employing standardized instruments. If unrecognized or mistreated, delirium may result in severe problems, such as extended mechanical breathing, longer ICU and hospital stays, enduring cognitive deficits, and elevated mortality rates.[5]

Numerous predisposing and triggering variables have been recognized for delirium in critically ill elderly individuals. Predisposing factors encompass senior age, pre-existing cognitive deficits, chronic illnesses, and diminished functional capacity. Precipitating variables frequently include acute insults such as infections, metabolic imbalances, the administration of sedatives and analgesics, pain, sleep deprivation, and invasive interventions. The ICU environment, characterized by frequent illumination changes, loudness, limited mobility, and absence of orientation signals, exacerbates the onset of delirium.[6,7]

Considering the expanding older demographic and the rising number of ICU admissions for geriatric patients, there is a need to evaluate and manage delirium as a vital aspect of treatment. Delirium is not only upsetting for patients and families but also imposes a significant expense on healthcare systems.[8] Timely identification and management of delirium can markedly diminish problems and enhance outcomes; nevertheless, this necessitates knowledge, suitable training for healthcare professionals, and the application of proven assessment instruments such as the Confusion Assessment Method for the ICU (CAM-ICU).[9]

Despite the growing global focus, there is a paucity of evidence from Indian healthcare environments about the prevalence and risk factors of delirium in aged ICU patients. The majority of research has been performed in Western nations, and disparities in healthcare infrastructure, patient demographics, and disease prevalence necessitate localized

studies. This study seeks to address the gap by assessing the occurrence of delirium in elderly patients admitted to the ICU of a tertiary care medical college hospital. It aims to uncover shared risk factors and clinical outcomes related to delirium in this high-risk population.

AIMS AND OBJECTIVES

- To determine the prevalence of delirium among elderly patients admitted to the ICU.

MATERIALS AND METHODS

The present study was a hospital-based, descriptive, cross-sectional observational study conducted in the Medical Intensive Care Unit (MICU) of Sree Mookambika Institute of Medical Sciences, a tertiary care teaching hospital located in Kulasekharam, Tamil Nadu. The study was carried out over a period of 12 months, from March 2024 to February 2025. The study population consisted of elderly patients aged 60 years and above who were admitted to the MICU for more than 24 hours. These patients were included irrespective of the primary diagnosis at admission.

Inclusion Criteria

- Patients aged ≥60 years
- ICU stay ≥24 hours.
- Willingness to participate (through patient or legally authorized representative).

Exclusion Criteria:

- Patients with known psychiatric illness (e.g., schizophrenia, bipolar disorder).
- Patients with pre-existing severe cognitive impairment or dementia that made delirium assessment invalid.
- Patients who were deeply sedated or comatose throughout the ICU stay.
- Patients with language barriers or hearing impairments preventing valid assessment.

The study included 150 patients. Each patient underwent a comprehensive baseline assessment which included demographic information (such as age, gender) and clinical history. Clinical parameters such as vital signs, Glasgow Coma Scale score, and the need for mechanical ventilation or sedation were documented within the first 24 hours of ICU admission. Laboratory investigations including complete blood counts, renal and liver function tests, serum electrolytes, blood glucose, and arterial blood gas analysis were also recorded. Severity of illness was assessed using scoring systems like APACHE II and SOFA scores.

Delirium assessment was carried out using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), a validated tool suitable for use in both verbal and non-

verbal (intubated) patients. CAM-ICU assessments were performed twice daily by trained ICU personnel, capturing features such as acute onset, fluctuating mental status, inattention, disorganized thinking, and altered consciousness. Delirium was diagnosed if the patient demonstrated both acute onset and inattention, along with either disorganized thinking or altered consciousness. Patients were followed up daily throughout their ICU stay until discharge, transfer, or death, with repeated delirium assessments and outcome monitoring including duration of ICU stay and mortality.

Statistical analysis was performed using SPSS version 25.0. Continuous variables were expressed as mean ± standard deviation and compared using the independent t-test. Categorical variables were presented as frequencies and percentages, with comparisons made using the Chi-square test or Fisher's exact test where appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

The mean age of the study population was 69.3 ± 6.4 years, with a range from 60 to 89 years. (Table 1) Among them, 92 patients (61.3%) were male and 58 (38.7%) were female.

Age group	Frequency (n=150)	Percentage (%)
60–69 years	82	54.7%
70–79 years	51	34.0%
≥80 years	17	11.3%

Table 1: Distribution of Age

The most common comorbidities included hypertension (62.7%) and diabetes mellitus (51.3%). Chronic kidney disease and chronic obstructive pulmonary disease were also noted. (Table 2)

Comorbid Conditions	Frequency (n=150)	Percentage (%)
Hypertension	94	62.7%
Diabetes Mellitus	77	51.3%
Chronic Kidney Disease	31	20.7%
Chronic Obstructive Pulmonary Disease	18	12.0%

Table 2: Comorbid Conditions

The incidence of delirium in the MICU elderly population was found to be 56(37.3%). Hypoactive delirium was the most frequently observed subtype. (Table 3) Most cases 42(75%) developed within the first 48 hours of ICU admission.

Subtypes of Delirium	Frequency (n=56)	Percentage (%)
Hypoactive	34	60.7%
Hyperactive	16	28.6%
Mixed	6	10.7%

Table 3: Subtypes of Delirium

Statistical analysis showed that the development of delirium was significantly associated with use of sedatives (p = 0.006), mechanical ventilation (p = 0.002), and a history of cognitive impairment (p = 0.021). Severity of illness was assessed using APACHE II and SOFA scores. Patients with delirium had significantly higher mean scores. (Table 4)

Parameter	All Patients (n=150)	With Delirium (n=56)	Without Delirium (n=94)	p-value
Pre-existing Cognitive Impairment	15 (10%)	10 (17.9%)	5 (5.3%)	0.021*
Mechanical Ventilation	61 (40.7%)	32 (57.1%)	29 (30.9%)	0.002*
Sedative Use	49 (32.7%)	27 (48.2%)	22 (23.4%)	0.006*
Mean APACHE II Score	17.5 ± 6.2	21.1 ± 5.8	15.2 ± 5.3	<0.001*
Mean SOFA Score	5.8 ± 2.9	7.3 ± 2.7	4.9 ± 2.4	<0.001*

Table 4: Mean APACHE II and SOFA Scores

Delirium was significantly associated with increased ICU length of stay and mortality. Patients with delirium stayed longer in the ICU and had a higher rate of death.

Outcome Parameter	With Delirium (n=56)	Without Delirium (n=94)	p-value
Mean ICU Stay (days)	9.4 ± 3.7	5.8 ± 2.1	<0.001*
ICU Mortality	18 (32.1%)	12 (12.8%)	0.004*

Table 5: ICU Outcomes Based on Delirium Status

DISCUSSION

The mean age of the study population was 69.3 ± 6.4 years, aligning with global data that indicate increased ICU admissions among older adults due to age-related physiological vulnerability and multiple comorbidities. The majority of patients (54.7%) were between 60–69 years, and 11.3% were aged 80 years or more, reflecting the increasing trend of advanced-age ICU admissions.

A male predominance was observed (61.3%), due to higher rates of comorbidities, cardiovascular risk factors, and critical illness in men. Hypertension (62.7%) and diabetes mellitus (51.3%) were the most prevalent comorbid conditions in this study. These chronic diseases are known contributors to vascular dysfunction, neuroinflammation, and impaired cerebral autoregulation, all of which may predispose individuals to delirium.

The incidence of delirium in this study was 37.3%, which is within the range reported in other ICU studies, where delirium prevalence in elderly patients varies from 20% to 60%. Notably, the hypoactive subtype was the most common presentation (60.7%), consistent with prior research indicating that hypoactive delirium is often under-recognized yet predominant in elderly ICU patients. Importantly, 75% of delirium cases occurred within the first 48 hours of admission, emphasizing the need for early and frequent screening.

Several clinical variables were found to be significantly associated with delirium. Sedative use ($p = 0.006$) and mechanical ventilation ($p = 0.002$) were strongly linked to delirium occurrence. Sedatives, particularly benzodiazepines, have been implicated in the pathogenesis of ICU delirium by impairing neurotransmitter balance and suppressing cognitive arousal. Similarly, mechanical ventilation, with associated discomfort, sedation, and altered sleep-wake cycles, is a well-documented risk factor. A pre-existing cognitive impairment also showed a significant association ($p = 0.021$), suggesting that baseline neurocognitive deficits heighten susceptibility to delirium in the ICU environment.

Furthermore, severity of illness, as assessed by APACHE II and SOFA scores, was significantly higher in patients who developed delirium ($p < 0.001$ for both). This finding highlights the interplay between critical illness severity, systemic inflammation, and cerebral dysfunction, which contribute to delirium pathophysiology. Elevated scores may reflect not only the burden of organ dysfunction but also the cumulative stress on the central nervous system.

In the study by Xiao Li et al.[10] delirium was observed in 66.1% of the cohort, with hypoactive delirium comprising nearly half the cases. Key factors associated with delirium included prolonged ICU stay, increased use of fentanyl, frequent application of physical restraints, and poor sleep quality. Logistic regression identified poor sleep quality (OR = 10.74) and use of physical restraints (OR = 13.04) as significant predictors.

Similarly, Tilouche et al.[11] demonstrated that delirious patients experienced markedly longer durations of mechanical ventilation and ICU stay, although no increase in mortality was noted. Delirium was strongly associated with adverse events such as unintentional

removal of catheters and endotracheal tubes. Multivariable analysis identified older age, hypertension, chronic obstructive pulmonary disease (COPD), steroid use, and sedation as independent risk factors for delirium.

Fuchs et al.[12] highlighted that delirium prevalence varied across hospital services, with the highest incidence in ICUs (83.3%), followed by intermediate care units and medical wards. Delirious patients were generally older, had prolonged hospital stays, higher rates of pre-existing dementia, and significantly higher in-hospital mortality (OR = 24.20). Institutionalization both before admission and after discharge was more common among these patients.

Erbay Dalli Ö et al.[13] found a delirium incidence of 31.8%, with the hypoactive subtype being the most frequent. Delirious patients showed higher scores on APACHE II, SOFA, and CPOT, elevated blood urea levels, and required more intensive interventions, including mechanical ventilation and physical restraints. Logistic regression revealed that CPOT score ≥3, physical restraint use, and ICU stay ≥7 days were independent predictors of delirium.

Alzoubi et al.[14] also reported a delirium incidence of 31.5%, with illness severity being the only significant predictor. Delirium correlated with longer ICU and hospital stays, as well as increased short- and long-term mortality.

Sadaf et al.[15] identified a delirium point prevalence of 39%, consistent across ICUs. Advanced age, higher APACHE IV scores, and elevated RASS scores were significant risk factors.

Junior MM et al.[16] also reported a 37.3% incidence of delirium. Among predisposing factors, hypertension showed a significant association. Precipitating factors included mechanical ventilation, opioid and benzodiazepine use, physical restraints, and absence of natural light exposure. Notably, absence of window/natural light (OR = 55.52) and longer ICU duration (OR = 1.145) emerged as strong independent predictors in multivariate analysis.

CONCLUSION

The current study revealed that delirium is a prevalent complication in elderly patients admitted to the Medical Intensive Care Unit, with an incidence of 37.3%. The bulk of instances transpired within the initial 48 hours after ICU admission, with the hypoactive subtype being the most predominant. Notable correlations were identified between delirium and the administration of sedatives, mechanical ventilation, elevated severity ratings (APACHE II and SOFA), and prior cognitive impairment. Moreover, delirium was associated

with extended ICU duration and heightened fatality rates. These findings emphasize the significance of early detection, consistent assessment utilizing validated instruments like CAM-ICU, and focused preventative measures to diminish the occurrence and negative consequences of delirium in older ICU patients. Prompt action may boost patient outcomes, alleviate ICU strain, and improve overall care quality.

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