Prevalence and risk factors of delirium in older patients admitted to a tertiary care centre in South India: A prospective, observational study

INTRODUCTION

Older adults have a high risk of developing delirium. The presence of delirium lengthens a patient's hospital stay and increases economic burden and mortality. Early detection and management of delirium decrease mortality, morbidity, and distress in older patients having the aforementioned condition and their caregivers.[1] Studies in India on the older population have evaluated the clinical profile, prognostic factors, and severity in patients with delirium.[2–4] The aim of the present study was to investigate the incidence and risk factors of delirium in older adults.

METHODS

A prospective study was carried out after receiving approval from the institutional ethics committee of Sri Venkateswara Institute of Medical Sciences, Tirupati (Roc.No.AS/11/IEC/SVIMS/2017 dated 2.7.2018). The study was carried out in accordance with the principles of the Declaration of Helsinki, 2013. Acute and critically ill patients were admitted to the medical and surgical intensive care units (ICUs) of the hospital. Among the admitted patients, those who had no conditions outlined under the exclusion criteria and who met the inclusion criteria were included in the study.

Patients aged ≥60 years, who were admitted for at least 24 hours to the ICU, and who were willing to participate were included in the study.

Patients with history of delirium, psychosis, dementia, depression, severe aphasia, stroke, brain injury, hearing impairment, and comatose, having a Richmond Agitation–Sedation Scale (RASS) score of -4 and -5 for more than three days,[5] and who were on ventilator and were non-responsive to arousal were excluded from the study.

Consent of the next legal heir, as applicable, was obtained before initiating the study. During the study period (28 November 2018 to 28 February 2020),

patients were evaluated twice and 12 hours apart within 24 hours of admission. Demography, history of comorbidities and trauma, and behavioural traits of the patients were documented by enquiring the attendants of said patients and by examining case sheets. Patients having RASS scores of − 3 to + 4 were evaluated for delirium using the Confusion Assessment Method for the ICU (CAM-ICU).[6] Subtypes of delirium were categorised based on the RASS score.[5] The primary objective of the study was to examine the prevalence of delirium, and its secondary objective was to find out the predictors of delirium.

A sample size of 827 was calculated by assuming an α value of 0.05, a β value of 0.20, a 50% prevalence of delirium, and null hypothesis value of 45.143. The mean and standard error of mean and categorical variables of patients with and without delirium were compared using student's independent t test and the Chi-squared test. Predictors of delirium were investigated using multivariate backward likelihood ratio logistic regression analysis. Exact p values are shown in the tables.

RESULTS

Among the 827 patients investigated, 105 (12.69%) were diagnosed with delirium. No significant difference in the prevalence of delirium was observed along the lines of gender, education, occupation, smoking, alcohol intake, type 2 diabetes, combination of comorbidities (such as hypertension and type 2 diabetes), and admission to either medical or surgical ICU. Patients who were Muslim or Christian, unmarried, who had hypertension, who were non-ventilated, who were on analgesics, benzodiazepine, and sedatives, who were hypoactive and who were diagnosed with the central nervous system diseases, metabolic diseases, and sensory impairment were significantly higher in delirious than non-delirious. A higher prevalence of delirium group was found in non-ventilated than in ventilated patients. Longer mean duration of ICU stay and longer mean duration of hypertension was noticed in patients with delirium than without it ($P<0.001$) [Table 1]. Logistic regression analysis showed that variables such as ICU stay, hypertension, and ventilator use were found to be predictors of delirium in older patients [Table 2].

DISCUSSION

Our study showed 12.69%(medical = 12.74% vs. surgical = 12.5%) prevalence of delirium. Prevalence of delirium was within range in patients admitted to the

Table 1: Prevalence and comparison of continuous and categorical variables in patients with and without delirium delirium			
Prevalence of delirium			
Total number of patients investigated (*n*)	**Delirium present *n* (%)**	**Delirium absent *n* (%)**	
827	105 (12.69)	722 (87.30)	-
Variable	**Delirium (*n*=105)**	**No Delirium (*n*=722)**	**p**
Age (years)	68.71 ± 0.64	68.51 ± 0.22	0.756
ICU duration (days)	4.45 ± 0.23	3.60 ± 0.07	<0.001
HTN + DM duration (months)	12.17 ± 3.05	9.27 ± 1.21	0.394
HTN duration (months)	47.42 ± 4.46	30.49 ± 1.74	0.001
DM duration (months)	19.31 ± 3.74	16.08 ± 1.46	0.431
Categorical variables			
Religion			
Hindu	90 (85.71)	657 (90.99)	0.025
Muslim	09 (8.57)	53 (7.34)	
Christian	06 (5.71)	12 (1.66)	
Marital status			
Unmarried	4 (3.80)	06 (0.83)	0.031
Married	76 (72.38)	526 (72.85)	
Widow/Widower	25 (23.80)	190 (26.31)	
Hypertensives	66 (62.85)	298 (41.27)	<0.001
Drugs administered			
Not administered	87 (82.85)	697 (96.53)	<0.001
Benzodiazepines	07 (6.66)	12 (1.66)	
Analgesics	08 (7.61)	12 (1.66)	
Sedatives	03 (2.85)	1 (0.13)	
Ventilated	41 (39.04)	83 (11.49)	
Non-ventilated	64 (60.95)	639 (88.50)	<0.001
Hyperactive delirium	11 (10.47)	0 (0.00)	<0.001
Hypoactive delirium	94 (89.52)	3 (0.41)	
Disease condition			
Cardiac diseases	24 (22.85)	218 (30.19)	0.006
Chronic kidney disease	08 (7.61)	74 (10.24)	
Central nervous system diseases	32 (30.47)	129 (17.86)	
Chronic obstructive pulmonary disease	07 (6.66)	51 (7.06)	
Post-surgical patients	21 (20.00)	147 (20.36)	
Metabolic diseases	05 (4.76)	24 (3.32)	
Cancer	05 (4.76)	57 (7.89)	
Sensory impairment	02 (1.90)	03 (0.41)	
Liver disease	00 (0.00)	11 (1.52)	
Urological disease	00 (0.00)	08 (1.10)	
Substance abuse	01 (0.95)	00 (0.00)	

ICU=Intensive care unit; DM=Diabetes mellitus (type 2): HTN: Hypertension

Table 2: Predictors of delirium analysed using logistic regression analysis					
Variable	**B**	**S.E**	**Odds ratio 95% CI**	**p**	**Nagelkerke *R*²**
ICU stay	0.133	0.042	1.143 (1.053-1.240)	0.001	0.146
Hypertension	−0.858	0.225	0.424 (0.273-0.659)	0.000	
Ventilator use	−1.505	0.237	0.222 (0.140-0.354)	0.000	

ICU=Intensive care unit; B=Coefficient for the constant; SE: Standard error; *P*=Probability

medical ICU (5%–38%)[7] but lower in those admitted to the surgical ICU (15%–25%)[8] in the present study than in reported studies due to differences in care setting, type and time frame of evaluation, experience of the evaluator, method used for diagnosis, and exclusion of patients with comorbidities.[1,9] Higher prevalence of hypoactive delirium in the present study may be due to the higher percentage of patients taking benzodiazepines.

Longer mean ICU stay in patients with delirium than those without it may be due to the settings reserved for clinically severe patients or failure of healthcare settings in providing effective primary care and post-acute

rehabilitation.[10] Longer hospital stay was shown to increase the risk of the patient developing delirium.[8]

Hypertension was reported as a significant risk factor of delirium among older adults.[11] In the present study, a significantly higher proportion of patients with hypertension and a longer mean duration of hypertension were observed in patients with delirium than in those without it[Table 1].

Prevalence of delirium was significantly higher in non-ventilated versus ventilated patients in the present study [Table 1]. However, prevalence of delirium ranged from 20% to 50% in non-mechanically ventilated patients.[12] A lower prevalence of delirium in ventilated versus non-ventilated patients may be due to the lower percentage of ventilated patients in the present study.

The strength of the study is that it was the largest prospective study on older patients in the Indian context and their evaluation was carried out using the CAM-ICU. Limitations include the study being single-centre focused, study being applicable only to the patients admitted to the ICU, non-evaluation of severity of delirium and blood/serum markers, and the assessment of delirium being done within 24 hours. This was only a cross-sectional study, and risk factors identified for delirium need to be established in longitudinal studies.

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Conflicts of interest
There are no conflicts of interest.

M. Nagarathnam[1], S.A.A. Latheef[2],
M. Hanumantha Rao[3], Aloka Samantaray[3]

[1]Department of Medical and Surgical Nursing, College of Nursing,
[3]Department of Anaesthesiology, Sri Venkateswara Institute of
Medical Sciences, Tirupati, Andhra Pradesh, [2]Post-Doctoral Fellow,
School of Life Sciences, University of Hyderabad, Hyderabad,
Telangana, India

Address for correspondence:
Dr. S.A.A. Latheef,
Visiting Scientist, Department of Genetics, Osmania University,
Hyderabad – 500 006, Telangana, India.
E-mail: yakheen@gmail.com

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