

ASSESSMENT OF PROGNOSTIC SIGNIFICANCE OF DELIRIUM SUBTYPES IN CRITICALLY ILL MEDICAL AND SURGICAL PATIENTS

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Abstract

Background: To assess prognostic significance of delirium subtypes in critically ill medical and surgical patients. **Materials and Methods:** One hundred ten patients admitted to the medical or surgical intensive care unit (ICU) of both genders were enrolled. The delirium subtypes were classified based on the combined results of the delirium assessment with either the CAM-ICU or ICDSC and the RASS score. Parameters such as hospital mortality, ICU mortality, ICU length of stay, coma, mechanical ventilation, was recorded. **Result:** Out of 110 patients, males were 50 (45.4%) and females were 60 (54.6%). Out of 110 patients, 65 had no delirium and 45 had delirium. The mean APACHE IV score was 52.6 and 72.4, ICU LOS was 3.1 days and 6.5 days, no. of delirium days was 0 and 2.4, hospital mortality was 12 and 8, ICU mortality was 4 and 5, no. of coma days was 1.2 and 3.9 and ventilation, day was 2.3 and 6.4 in no delirium and delirium group. The difference was significant ($P < 0.05$). Admission diagnosis was medical in 30 in no delirium group, 14 in hypoactive and 8 in mixed type of delirium. Elective surgery was seen in 14, 10 and 6 and emergency surgery in 21, 3 and 4 cases respectively. APACHE score IV was 52.6, 74.2 and 70.3 respectively. The difference was significant ($P < 0.05$). **Conclusion:** Critically ill patients with mixed subtype had significantly worse hospital and ICU mortality, longer ICU stay and mechanical ventilation than patients without delirium. The mixed subtype appeared to have the worst prognosis as compared to hypoactive delirium.

INTRODUCTION

Delirium is a common manifestation of vital organ failure in the intensive care unit (ICU), occurring in 30–70% of critically ill patients. Its occurrence and duration are associated with longer hospital stay, higher healthcare costs, mortality, and long-term cognitive impairment.^[1] Three distinct delirium subtypes have been described in the literature: hypoactive (or lethargic), hyperactive (or agitated), and mixed motor subtype, indicating an alternating state between the other two subtypes. Delirium subtyping should, next to phenomenological differentiation, ideally have clear prognostic implications in order to direct prophylactic or therapeutic measures.^[2]

With an aging population, understanding the clinical presentation and outcomes of delirium will become increasingly relevant.^[3] Increased knowledge regarding delirium motor subtypes may aid the clinician in the management of geriatric post-operative patients. Cardiac surgery patients most

likely suffer from the hyperactive delirium subtype, which is less common in other admission categories. Patients with mixed delirium subtype suffered the most from short-term consequences.^[4]

The delirium incidence in ICU patients ranges from 11 to 89%.^[5] Despite the generally high delirium incidence rate and the accompanied serious health consequences, there is lack of evidence for prevention of delirium in ICU patients. Preventive measures consist of a multicomponent intervention strategy.^[6] We performed this study to assess prognostic significance of delirium subtypes in critically ill medical and surgical patients.

MATERIALS AND METHODS

After considering the utility of the study and obtaining approval from ethical review committee, we selected one hundred ten patients admitted to the medical or surgical intensive care unit (ICU) of both genders. Patients' consent was obtained before starting the study. Exclusion criteria were

neurological admission diagnosis, persistent coma or ICU readmissions.

Data such as name, age, gender etc. was recorded. Delirium was assessed using the confusion assessment. Parameters such as hospital mortality, ICU mortality, ICU length of stay, coma, mechanical ventilation, and use of antipsychotics, sedatives, benzodiazepines and opioids etc. was recorded. The delirium subtypes were classified based on the combined results of the delirium assessment with either the CAM-ICU or ICDSC and the RASS score. The RASS score ranges from – 5 (unarousable) to +4 (combative), in which a RASS score of 0 indicates that the patient is calm and alert. If the RASS score was – 4 or – 5, delirium assessment was not possible. The results were compiled and subjected for

statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

RESULTS

Out of 110 patients, males were 50 (45.4%) and females were 60 (54.6%) [Table 1].

Out of 110 patients, 65 had no delirium and 45 had delirium. The mean APACHE IV score was 52.6 and 72.4, ICU LOS was 3.1 days and 6.5 days, no. of delirium days was 0 and 2.4, hospital mortality was 12 and 8, ICU mortality was 4 and 5, coma days were 1.2 and 3.9 and days on ventilation were 2.3 and 6.4 in no delirium and delirium group. The difference was significant ($P < 0.05$) [Table 2].

Table 1: Patients distribution

Total- 110		
Gender	Males	Females
Number (%)	50 (45.4%)	60 (54.6%)

Table 2: Demographic and clinical characteristics

Parameters	No delirium (65)	Delirium (45)	P value
APACHE IV score	52.6	72.4	0.04
ICU LOS, day	3.1	6.5	0.02
No. of delirium days	0	2.4	0.01
Hospital mortality	12	8	0.04
ICU mortality	4	5	0.17
No. of coma days	1.2	3.9	0.05
Ventilation, day	2.3	6.4	0.02

Table 3: Baseline characteristics specified per delirium subtype.

Parameters	Variables	No delirium (65)	Hypoactive (27)	Mixed (18)	P value
Admission diagnosis	Medical	30	14	8	0.02
	Elective surgery	14	10	6	
	Emergency surgery	21	3	4	
APACHE IV score		52.6	74.2	70.3	0.05

Admission diagnosis was medical in 30 in no delirium group, 14 in hypoactive and 8 in mixed type of delirium. Elective surgery was seen in 14, 10 and 6 and emergency surgery in 21, 3 and 4 cases respectively. APACHE score IV was 52.6, 74.2 and 70.3 respectively. The difference was significant ($P < 0.05$) [Table 3].

DISCUSSION

Delirium is a syndrome defined as an acute onset of disturbances in consciousness and changes in cognition with a fluctuating course.^[7,8] Three subtypes of delirium can be distinguished. A hyperactive delirium subtype with symptoms of hyperalertness, agitation, delusions and hallucinations, a hypoactive subtype in which the patient is hypoalert, lethargic, motorically slow and has inappropriate speech and the alternating or mixed subtype.^[9,10] Delirium in ICU patients is associated with short-term health consequences such as prolonged duration of mechanical ventilation and length of stay and higher mortality rates.^[11,12] We performed this study to assess prognostic

significance of delirium subtypes in critically ill medical and surgical patients.

Our results showed that out of 110 patients, males were 50 (45.4%) and females were 60 (54.6%). Smit et al^[13] found that delirium occurred in 381 (24.4%) of 1564 patients (52.5% hypoactive, 39.1% mixed, 7.3% hyperactive). It was found that patients with mixed delirium had higher hospital mortality than non-delirious patients whereas hypoactive patients did not. Similar results were found for ICU mortality. Both subtypes had longer ICU stay, more coma, increased mechanical ventilation frequency and duration, and received more antipsychotics, sedatives, benzodiazepines and opioids as compared to non-delirious patients. Except for coma and benzodiazepine use, the most unfavourable outcomes were observed in patients with mixed delirium.

Out of 110 patients, 65 had no delirium and 45 had delirium. The mean APACHE IV score was 52.6 and 72.4, ICU LOS was 3.1 days and 6.5 days, no. of delirium days was 0 and 2.4, hospital mortality was 12 and 8, ICU mortality was 4 and 5, no. of coma days was 1.2 and 3.9 and ventilation day was 2.3 and 6.4 in no delirium and delirium group. Robinson et al^[14] in their study, recruited subjects 50 years and

older with planned post-operative intensive care unit admission following an elective operation. Delirium occurred in 43% (74/172); including the motor subtypes of hypoactive 68% (50/74), mixed 31% (23/74) and hyperactive 1% (1/74). Subjects with hypoactive delirium were found to be older (71 ± 9 vs. 65 ± 9 years; $p=0.002$) and more anemic. Subjects with hypoactive delirium were found to have higher six-month mortality (32% (16/50) vs. 9% (2/23); $p=0.041$). Delirium related adverse events occurred in 24% (18/74) of delirious subjects; pulled lines/tubes occurred more frequently in the mixed group ($p=0.006$) and decubitus ulcers were more common in the hypoactive group ($p=0.002$).

Admission diagnosis was medical in 30 in no delirium group, 14 in hypoactive and 8 in mixed type of delirium. Elective surgery was seen in 14, 10 and 6 and emergency surgery in 21, 3 and 4 cases respectively. APACHE score IV was 52.6, 74.2 and 70.3 respectively. Van den et al,^[15] assessed the overall incidence and duration of delirium, per delirium subtype and per ICU admission diagnosis. Delirium was assessed using the confusion assessment method-ICU three times a day. 1613 patients were included of which 411 (26%) developed delirium. The incidence rate in the neurosurgical (10%) and cardiac surgery group (12%) was the lowest, incidence was intermediate in medical patients (40%), while patients with a neurological diagnosis had the highest incidence (64%). The mixed subtype occurred the most (53%), while the hyperactive subtype the least (10%). The median delirium duration was two days [IQR 1–7], but significantly longer for the mixed subtype. More delirious patients were mechanically ventilated and for a longer period of time, were more likely to remove their tube and catheters, stayed in the ICU and hospital for a longer time, and had a six times higher chance of dying compared to non-delirium ICU patients, even after adjusting for their severity of illness score. Delirium was associated with an extended duration of mechanical ventilation, length of stay in the ICU and in-hospital, as well as with in-hospital mortality.

CONCLUSION

Critically ill patients with mixed delirium had significantly worse hospital and ICU mortality, longer ICU stay and mechanical ventilation than patients without delirium. The mixed subtype appeared to have the worst prognosis as compared to hypoactive delirium.

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