

Original Research Article

Intensive care unit delirium - does prolonged intensive care unit stay increase morbidity

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ABSTRACT

Background: The term intensive care unit (ICU) delirium or ICU psychosis denotes the transient period of psychosis exhibited by the geriatric patients placed in long term ICU care. This condition can be mistaken for organic neurological deterioration and can result in improper treatment, delayed rehabilitation and longer ICU stay. The objective of the study was to analyse the outcome of early ward rehabilitation in post-surgical patients with ICU psychosis.

Methods: This is a retrospective case control study of 45 geriatric patients (above 60 years of age) who developed delirium or psychosis after long term ICU stay (>4 days) following a major trauma and orthopaedic procedure. Of the 45 patients, 28 patients (group A) were shifted out of ICU after haemodynamic stability despite continued delirious episodes. The remaining 17 patients (group B) were those who were retained in the ICU for complete neurological recovery.

Results: Significant positive difference was noted in patients who were shifted out of ICU early (group A) compared to group B. Group A patients had faster recovery, lesser delirious episodes (2.3 ± 0.9 compared to 13.4 ± 2.7) and fewer days of hospital stay (4.9 ± 1.2 compared to 12.4 ± 2.6) when compared to group B. None of the patients had any episodes of psychosis after discharge from the hospital when followed up for duration of 6 months.

Conclusions: Post-operative geriatric patients diagnosed with ICU psychosis fare better with early out of ICU mobilisation. It is not essential to wait for full neurological recovery to shift these patients out of ICU though close ward monitoring may be essential in some cases.

Keywords: ICU delirium, Femur fracture, Post-operative care, Delirium management, ICU care, Old age care

INTRODUCTION

Delirium is the development of acute dysfunction of cognition and consciousness. It can be caused by variety of factors like high fever, medications, infections, stroke, tumors in the brain, prolonged bed rest and recumbency.¹ Development of delirious episodes in a patient treated in Intensive care unit of the hospital without preexisting neurologic disorder is termed as intensive care unit (ICU) psychosis. This condition is particularly more common following major trauma and orthopaedic procedures due to long term recumbency, closed door monitoring and

improper sleep-wake cycle.² Failure to identify ICU psychosis in elderly patients can lead to improper treatment and prolongation of ICU stay. Hence it is important to diagnose ICU delirium early and treat it appropriately. The objective of this study is to compare the neurological outcome of shifting the patients who getting treated in ICU out of ICU earlier as opposed to later.

METHODS

This is a retrospective case control study of 45 patients who developed ICU psychosis after major trauma of the

lower limb and underwent surgical procedure for the fracture. The study was conducted at Saveetha Medical College and Hospital, Thandalam, Chennai, Tamil Nadu, during the period of June 2018 to May 2019 (12 months). Institute ethics committee approval was obtained prior to the start of the study.

Inclusion criteria

Patients above 60 years of age, immobilized in bed, sustained major lower limb trauma- femur fracture, underwent surgical fixation of the fracture.

Exclusion criteria

Patients less than 60 years of age, mobilizing out of bed patients, history of head injury, pre-existing neurological disorder, history of delirium prior to event, history of psychiatric illness in the family.

In this retrospective study, 45 patients who had developed ICU delirium following management of femoral fractures were selected. No pre-existing neurological illness was noted in these patients. The patients have had sustained fracture of femur. 16 of them were admitted directly in ICU preoperatively and 29 of them were admitted in ICU only in their post-operative period. 22 of them were in ICU care for cardiac related management, 12 of them for respiratory support and 11 of them were treated for post-operative haemodynamic instability.

The patients had developed intermittent delirious episode with lucid intervals by 2nd - 3rd day of post-operative ICU stay. They were evaluated by neurologists with CT scans of their brain in all 45 of them and MRI of brain in 11 of them. None of them had significant abnormality in their CT scan or their MRI scan. All their blood parameters (renal function tests, liver function tests, complete blood count, plasma blood glucose levels) were within the normal limits. Mild electrolytes imbalance was noted in some patients and were corrected appropriately.

The patients were treated with sedatives and anti-psychotics as per neurologist's advice. There was decrease in the delirious episode but impairment of neurological and cognitive status persisted. Of the 45 of them, 26 were treated with anti-psychotics alone and 15 required both anti-psychotics and sedatives to treat their psychosis episodes during their ICU stay. 34 of these patients received 4 mg haloperidol I.M. twice daily while 11 patients received haloperidol 4mg I.M. thrice daily. 28 patients were given 2-4 mg diazepam twice daily for sedating them during their aggressive episode.

28 patients (group A) were shifted out of ICU early following hemodynamic stability whereas 17 patients were kept in ICU for a longer period (group B). The neurological parameters of the two groups were monitored closely and the results were analyzed.

RESULTS

Of the 45 patients studied, the age varied from 60 to 74 years (mean- 67.7 years). 31 of them were males and 14 were females. The patients had sustained fracture of femur that include 24 intertrochanteric fractures, 7 subtrochanteric fractures and 14 distal femur fractures.

Table 1: Sex of the group.

Sex	N
Males	31
Females	14

Table 2: Location of the fracture.

Fractures	N
Intertrochanteric	24
Subtrochanteric	7
Distal femur	14

The total duration of ICU stays for group A varied from 2 days to 6 days with a mean duration of stay being 3.2 days. The total duration of ICU stays for group B varied from 7 to 22 days with the mean stay being 9.7 days.

Both the groups had similar number of delirious episodes during their ICU stay. After hemodynamic stability, group A patients who were shifted into wards had a total of 1-4 episodes of delirium with a mean of 2.3 episodes per patient. group B patients had 5-20 episodes of delirium with a mean of 13.4 per patient.

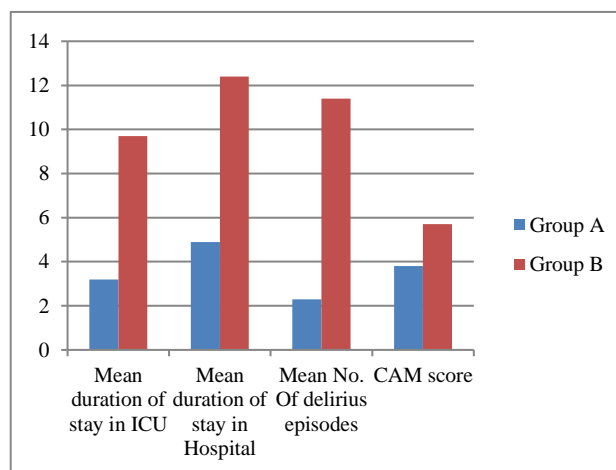


Figure 1: Comparison of group A versus group B.

Duration of hospital stay of group A patients after shifting out of ICU was between 1-3 days with a mean of 1.7 days while that for group B patients was 1-4 days with a mean of 2.7 days. None of the patients from either group developed delirious episodes after discharge from the hospital in 6 months follow-up. The average CAM ICU-7 delirium severity scores for group A patients was 3.8. This

is significantly lower than the CAM score for group B patients which were 5.7.

Among these patients, we observed that, when they were shifted out of the ICU during their lucid phase, they showed remarkable recovery in their neurological status. Waiting for the delirium to settle resulted in delay in surgery in pre-operative patients and prolongation of the ICU stays in post-operative patients. Some patients were in ICU observation up to 14 days after their ICU admission, even after cardiac and respiratory stability.

In fact, the group of patients (group A) who were shifted out of ICU earlier had fewer delirious episodes and required a shorter hospital stay compared with the group of patients (group B) who were shifted out of ICU later. None of the 45 patients showed any signs of delirium after they were shifted out of the ICU and in 6 months follow-up.

DISCUSSION

The cause for ICU delirium is multifactorial. The risk factors include trauma, long term immobilization, major surgery, electrolyte imbalance, closed door monitoring, sleep deprivation, advanced age, male gender etc.¹ The prevalence of ICU delirium in geriatric population has been reported to be as high as 80% in some studies.^{2,3}

Failure to recognize ICU psychosis can lead to prolongation of ICU stay, increased hospital expenditure, delay in rehabilitation and stress to the patient's attenders. Delay in rehabilitation in these elderly patients has its own associated illnesses like deep vein thrombosis, pulmonary embolism etc. ICU psychosis being mistaken for an organic brain injury results in mismanagement.³⁻⁵ Misdiagnosing and extensive treatment of ICU Delirium increases the rate of mortality among the elderly patients.^{6,7} Patients who develop ICU psychosis require multimodal intervention consisting of pharmacological drugs, supportive care, counseling etc.⁸

We believe that upon reviewing literature, such a study has not been previously conducted and this novelty will need to be investigated further with a larger sample size for definitive evidence.

CONCLUSION

Early mobilization and shift-out to ward may be beneficial in patients suspected to have ICU delirium. Awaiting full neurological recovery may result in prolongation of ICU stay and delayed rehabilitation in these patients. However, further studies are required for early detection, prevention and better treatment of ICU psychosis.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Monks RC. Intensive care unit psychosis. Canadian Family Physician. 1984;30:383.
2. Fong TG, Tulebaev SR, Inouye SK. Delirium in elderly adults: diagnosis, prevention and treatment. Nature Rev Neuro. 2009;5(4):210.
3. Aldemir M, Ozen S, Kara IH, Sir A, Baç B. Predisposing factors for delirium in the surgical intensive care unit. Critical care. 2001;5(5):265.
4. Girard TD, Pandharipande PP, Ely EW. Delirium in the intensive care unit. Critical care. 2008;12(3):3.
5. Pandharipande P, Cotton BA, Shintani A, Thompson J, Pun BT, Morris JA, et al. Prevalence and risk factors for development of delirium in surgical and trauma ICU patients. The J of trauma. 2008;65(1):34.
6. Ely EW, Shintani A, Truman B, Speroff T, Gordon SM, Harrell FE, et al. Delirium as a predictor of mortality in mechanically ventilated patients in the intensive care unit. Jama. 2004;291(14):1753-62.
7. Inouye S, Charpentier PA. Precipitating factors for delirium in hospitalized elderly persons. Jama. 1996;275(11):852-7.
8. Lundstrom M, Edlund A, Karlsson S, Brannstrom B, Bucht G, Gustafson Y. A multifactorial intervention program reduces the duration of delirium, length of hospitalization, and mortality in delirious patients. J of the Amer Geriatr Soci. 2005;53(4):622-8.
9. Khan BA, Perkins AJ, Gao S. The Confusion Assessment Method for the ICU-7 Delirium Severity Scale: A Novel Delirium Severity Instrument for Use in the ICU. Crit Care Med. 2017;45(5):851-7.

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