Delirium in mechanically ventilated intensive care patients: prospective cohort

Delirio en pacientes de cuidados intensivos con ventilación mecánica: cohorte prospectiva

Delirium em pacientes sob ventilação mecânica em terapia intensiva: coorte prospectiva

Antonio Amadeus Souza de Farias[1]
ORCID: 0000-0002-9310-0830
Weverson Ferreira Lopes[1]
ORCID: 0000-0003-1734-3096
Simone Aparecida Fernandes da Silva[1]
ORCID: 0000-0002-7030-6748
Thatiana Lameira Maciel Amaral[1]
ORCID: 0000-0002-9197-5633
Patrícia Rezende do Prado[1]
ORCID: 0000-0002-3563-6602

[1]Universidade Federal do Acre. Acre, Brazil.

Corresponding author:
Patrícia Rezende do Prado
E-mail:
patyrezendeprado@gmail.com

Abstract

The aim was to identify the incidence and protective and risk factors for delirium in mechanically ventilated patients in an intensive care unit. Prospective cohort carried out in a public intensive care unit, from September 2019 to February 2020. Results were initially described using absolute and relative frequency. Cox regression was used to identify protective and risk factors for delirium, considering a 95% confidence interval. Protective factors for delirium were the variables of the ABCDEF bundle: assessment, prevention and management of pain, choice of analgesia and sedation (dexmedetomidine), assessment, prevention and management of delirium, and family involvement. The risk factors were alcohol consumption, use of physical restraint, longer hospital stay and mechanical ventilation. The incidence of delirium identified is high and the risk factors deserve immediate intervention, as well as the use of the ABCDEF bundle is suggested to reduce the incidence of delirium in the unit. However, training and qualification of the multidisciplinary team are essential for the assessment and early diagnosis of delirium, as well as for the assessment of daily awakening, type of sedative used, daily decrease in sedation, mechanical ventilation time and permanence of patients in the intensive care unit.

Descriptors: Delirium; Ventilators Mechanical; Protective Factors; Risk Factors; Intensive Care Units; Patient Care Team.

Resumén

El objetivo fue identificar la incidencia y los factores protectores y de riesgo para el delirio en pacientes ventilados mecánicamente en una unidad de cuidados intensivos. Cohorte prospectiva realizada en una unidad de cuidados intensivos pública, de septiembre de 2019 a febrero de 2020. Los resultados se describieron inicialmente mediante frecuencia absoluta y relativa. Se utilizó la regresión de Cox para identificar los factores protectores y de riesgo para el delirio, considerando un intervalo de confianza del 95%. Los factores protectores para el delirio fueron las variables del paquete ABCDEF: evaluación, prevención y manejo del dolor, elección de analgesia y sedación (dexmedetomidina), evaluación, prevención y manejo del delirio y participación familiar. Los factores de riesgo fueron el consumo de alcohol, uso de contención física, mayor estancia hospitalaria y ventilación mecánica. La incidencia de delirio identificada es alta y los factores de riesgo ameritan intervención inmediata, así como se sugiere el uso del paquete ABCDEF para disminuir la incidencia de delirio en la unidad. Sin embargo, la formación y cualificación del equipo multidisciplinar son fundamentales para la valoración y diagnóstico precoz del delirio, así como para la valoración del despertar diario, tipo de sedante utilizado, disminución diaria de la sedación, tiempo de ventilación mecánica y permanencia de los pacientes en la unidad de cuidados intensivos.

Descriptores: Delirio; Respiración Artificial; Factores Protectores; Factores de Riesgo; Unidades de Cuidados Intensivos; Grupo de Atención al Paciente.

Resumo

Objetivou-se identificar a incidência e os fatores de proteção e de risco para delirium em pacientes sob ventilação mecânica em unidade de terapia intensiva. Coorte prospectiva realizada em uma unidade de terapia intensiva pública, no período de setembro de 2019 a fevereiro de 2020. Os resultados foram descritos, inicialmente, por meio de frequência absoluta e relativa. Foi utilizada a regressão de Cox para identificar os fatores protetores e de risco para o delirium, considerando intervalo de confiança de 95%. Os fatores de proteção para delirium foram as variáveis do bundle ABCDEF: avaliação, prevenção e manejo da dor, escolha da analgesia e sedação (dexmedetomidina), avaliação, prevenção e manejo do delirium e envolvimento familiar. Os fatores de risco foram o etilismo, uso de contenção física, maior tempo de internação e de ventilação mecânica. A incidência de delirium identificada está elevada e os fatores de risco merecem intervenção imediata, assim como, sugere-se o uso do bundle ABCDEF para a diminuição da incidência de delirium na unidade. No entanto, são fundamentais o treinamento e a capacitação da equipe multidisciplinar para a avaliação e diagnóstico precoce do delirium, assim como, para a avaliação do despertar diário, tipo de sedativo utilizado, diminuição diária da sedação, tempo de ventilação mecânica e de permanência dos pacientes em unidade de terapia intensiva.

Descritores: Delírio; Ventiladores Mecânicos; Fatores de Proteção; Fatores de Risco; Unidades de Terapia Intensiva; Equipe de Assistência ao Paciente.

Introduction

Delirium is an acute brain dysfunction characterized by altered level of consciousness, inattention, thought disorganization and is associated with increased length of mechanical ventilation and hospital stay, use of sedatives, opioids and hospital mortality. It occurs more frequently in patients admitted to an intensive care unit (ICU) who use mechanical ventilation[1,2].

Assessment and diagnosis of delirium can be performed using the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) or the Confusion Assessment Method in Intensive Care Unit (CAM-ICU). The CAM-ICU scale has demonstrated excellent reliability and validity in use by nurses and physicians, and is indicated for mechanically ventilated ICU patients[3,4].

The main risk factors for delirium are prolonged sedation, use of benzodiazepines and opioids, lack of contact with the family, lack of orientation in time and space, immobility, physical restraint, use of invasive devices, infection, and drug withdrawal to licit and/or illicit, including alcohol[1,2,5,6].

The incidence of delirium in an ICU in Uruguay was 80%[5], however, in a systematic review with meta-analysis with 42 articles, only 08 (25.0%) identified an incidence above 60%[1]. In medical clinics, the incidence was lower, 22.3% in a teaching hospital in São Paulo[7] and 28.0% in elderly patients in a medical clinic, in the Amazon[8]. However, the incidence of delirium in ICUs in the northern region of Brazil is unknown, a fact that prompts evaluation, since the proposed unit does not use an evaluation and prevention protocol for delirium.

Prevention of delirium is critical in ICU patients. The ABCDEF bundle includes effective and low-cost strategies for the assessment, prevention and management of risk factors for delirium, aiming at better patient outcomes. The components of this bundle are pain assessment, prevention and management; the assessment of daily awakening and the possibility of performing the spontaneous breathing test (SBT); the choice of analgesia and sedation; the assessment, prevention and management of delirium; early mobilization and physical exercise and family participation in patient hospitalization[9,10].

The introduction of changes in the routine and the clinical evaluation of the patient, aiming at the prevention of delirium is complex and requires intense work on the part of the multidisciplinary team in the ICU. In practice, there is a dichotomy between the perceived importance of delirium and monitoring and prevention practices, mainly because this clinical condition is not the primary reason for hospitalization[11].

In the studied ICU, there is no protocol for the prevention of delirium and the incidence and risk factors in patients have never been investigated, which deserves to be elucidated. Thus, the objective of this research was to identify the incidence and the protective and risk factors for delirium in patients under mechanical ventilation in an intensive care unit.

Methodology

This is a prospective cohort study carried out in a public ICU in a Brazilian capital, from September 2019 to February 2020. The ICU of the study has 18 beds for adult patients and is a reference for the state.

Patients aged 18 years or older, intubated or tracheostomized, who were under mechanical ventilation for more than 24 hours were included[5,12].

Exclusion criteria were patients admitted to the ICU with delirium, or who were on non-invasive ventilation (NIV), ICU readmission within 48 hours of discharge, severe neurological injuries, neuropsychiatric disease, dementia, death in 72 hours, drug abuse, patients with special communication needs and foreigners[5,12].

During the study period, 286 patients were admitted to the ICU. Of these, 195 patients were excluded due to defined criteria. Thus, the final sample consisted of 91 patients.

The cohort time zero (T0) was the day the patient was admitted to the ICU, and the follow-up time (ΔT) was the last day of hospitalization (discharge or death).

Data collection and patient assessment were performed by the ICU-resident physical therapist, after training from the CAM-ICU, and took place daily, in the morning, or whenever necessary[5]. The data collection instrument was based on a study[12] whose ICU is similar to that of the study.

The instrument variables were: age (continuous and categorized), gender (male and female), reason for hospitalization (clinical or trauma/surgical), smoking, alcohol consumption, length of stay in the ICU (continuous and categorized as < and ≥14 days), length of stay under mechanical ventilation (continuous and categorized as < and ≥7 days), classification of disease severity by the Sequential Organ Failure Assessment (SOFA), Simplified Acute Physiology Score (SAPS III), sepsis (change ≥ 2 points in the score SOFA in the face of suspected infection), physical restraint, functional dependence before hospitalization (based on medical diagnosis established before admission), occurrence of delirium (present or absent), type of delirium (hypoactive or hyperactive), outcome (discharge or death)[12].

Regarding the ABCDEF bundle, the type of sedation and analgesia used by the patient (midazolam + fentanyl or dexmedetomidine) was evaluated; pain assessment; TRE; assessment, prevention and management of delirium; early mobilization and involvement with the family, through the extended visit[9,10]. The diagnosis of delirium was identified by the Richmond Agitation-Sedation Scale (RASS) and Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) scales[3].

For the application of the CAM-ICU, the patient should present RASS ≥ -3. Whenever an acute change or fluctuation was observed in the course of his mental status, determined by abnormalities or fluctuations in RASS scores, inattention, disorganized thinking, or altered level of consciousness, the sequence of letters, "S A V E A H A A R T" was presented, and the patient was instructed to shake the examiner's hand as soon as he heard the letter "A". Thus, more than three errors configured the diagnosis of delirium[3].

In the RASS assessment, patients were classified as deeply sedated when responding only to physical/painful stimulation with movement. Patients without eye opening (RASS score -4) or comatose (RASS score -5) were evaluated by the CAM-ICU until the RASS could be applied. If they did not present agitation or coma, the patients were classified as normal, presenting RASS 0. In this case, the evaluation was made from four questions with yes/no answers. If the result was less than 2 errors, there was no delirium. Delirium was classified as hypoactive when the RASS score was between 0 to -3, and hyperactive when the RASS score was ≥ 1[3,5].

Initially, the data were described using absolute (n) and relative (%) frequencies. To compare the groups, with and without delirium, Pearson's chi-square test or Fisher's exact test was used, in cases of small samples, considering a significance of 95%[13].

In the final explanatory model of protective and risk factors for delirium, multiple Cox regression was used, with crude hazard ratio (crude hazard ratio) and adjusted hazard ratio (adjusted hazard ratio). The independent variables that showed statistical significance in the univariate analysis were included in the multivariate regression model, considering p<0.10 for input in the final model, with the backward selection method (output alpha of 0.05). The 95% CI was considered for significance in the final model of protective factors for delirium[13].

Data were entered into an Excel spreadsheet in the Microsoft Office® 2010 package (Microsoft, Redmond, USA) and analyzed using the Statistical Package for Social Sciences (SPSS®), version 20.0 (SPSS, Chicago, USA).

This study was approved by the Research Ethics Committee of Fundação Hospitalar Estadual do Acre (FUNDHACRE), by opinion no. 466/2012, of the National Health Council.

Results

Of the 91 patients, 62.6% had delirium, with 59.6% of the hypoactive subtype. Most patients were young, with a mean age of 43.54 years, male, mean length of stay of 17.8 days, and death occurred in 27.5% of patients (Tables 1 and 2). Delirium was associated with variables alcohol consumption (p=0.001), functional dependence before hospitalization (p=0.03), use of physical restraint (p=0.005), length of stay (p=0.007), duration of mechanical ventilation (p<0.001), assessment, prevention and management of pain (p=0.01), choice of analgesia and sedation (p=0.002), assessment, prevention and management of delirium (p=0.002), early mobilization (p=0 .04) and family involvement (p<0.001) (Tables 2 and 3).

The risk factors for delirium were alcohol consumption, use of physical restraint, longer hospital stay and mechanical ventilation. The protective factors were the ABCDEF bundle items: pain assessment, prevention and management; choice of analgesia and sedation (dextomedetomidine); assessment, prevention and management of delirium and family involvement (Table 4).

Table 1. Measures of central tendency of patients in an Intensive Care Unit. Rio Branco, AC, Brazil, 2019-2020

Variable	Minimum	Average	Maximum	Median	Standard deviation
Age (years)	18	43,54	88	41,00	18,99
SAPS III*	22	56,31	93	57,00	13,51
SOFA†	01	8,12	14	8,00	3,08
Mechanical ventilation time (days)	01	8,82	43	5,00	9,41
Length of stay (days)	03	17,80	69	13,00	13,47

Note: *SAPS: Simplified Acute Physiology Score; †SOFA: Sequential Organ Failure Assessment.

Table 2. Characterization of patients in an Intensive Care Unit. Rio Branco, AC, Brazil, 2019-2020

Variable	Total n	%	Delirium No	Delirium Yes	p-value
Age					0,99
<60 years	68	74,7	26 (76,5)	42 (73,7)	
≥60 years	23	25,3	08 (23,5)	15 (26,3)	
Sex					0,20
Masculine	68	74,7	24 (70,6)	44 (77,2)	
Feminine	23	25,3	10 (29,4)	13 (22,8)	
Reason for hospitalization					
Clinical	40	44,0	14 (41,2)	26 (45,6)	0,66

Trauma/Surgical	51	56,0	20 (58,8)	31 (54,4)	
Smoking *					0,65
No	36	46,8	15 (48,4)	21 (45,7)	
Yes	41	53,2	16 (51,6)	25 (54,3)	
Alcoholism					
No	44	48,4	26 (76,5)	18 (31,6)	0,001
Yes	47	51,6	08 (23,5)	39 (68,4)	
Functional dependency					
No	75	82,4	32 (94,1)	43 (75,4)	0,03
Yes	16	17,6	02 (5,9)	14 (24,6)	
Physical restraint					0,005
No	38	41,8	20 (58,8)	18 (31,6)	
Yes	53	58,2	14 (41,2)	39 (68,4)	
Sepsis					0,09
No	61	67,0	23 (67,6)	38 (66,7)	
Yes	30	33,0	11 (32,4)	19 (33,3)	
SAPSIII[†]					0,42
< 50	31	34,1	13 (38,2)	18 (31,6)	
≥50	60	65,9	21 (61,8)	39 (68,4)	
SOFA[‡]					0,91
< 7	26	28,6	10 (29,4)	16 (28,1)	
≥7	65	71,4	24 (70,6)	41 (71,9)	
Length of hospital stay					0,007
< 14 days	48	52,7	18 (52,9)	30 (52,6)	
≥14 days	43	47,3	16 (47,1)	27 (47,4)	
Mechanical ventilation time					<0,001
< 7 days	50	54,9	21 (61,8)	29 (50,9)	
≥7 days	41	45,1	13 (38,2)	28 (49,1)	
Occurrence of delirium					
No	34	37,4	-	-	
Yes	57	62,6	-	-	
Subtype (n=57)					
Hyperactive	23	40,4	-	-	
Underactive	34	59,6	-	-	
Outcome					0,07
Discharge	66	72,5	28 (82,4)	38 (66,7)	
Death	25	27,5	06 (17,6)	19 (33,3)	

Note: *Missing; [†]SAPS: Simplified Acute Physiology Score; [‡]SOFA: Sequential Organ Failure Assessment.

Table 3. Patient assessment for delirium according to the ABCDEF bundle in an Intensive Care Unit. Rio Branco, AC, Brazil, 2019-2020

Variable	Total		Without delirium	With delirium	p-value
	N	%			
Assessment, prevention and management of pain *					
No	32	37,2	08 (25,0)	24 (75,0)	0,01

Yes	54	62,8	26 (48,1)	28 (51,9)	
Sedation interruption + Spontaneous breathing test*					
No	22	25,6	07 (31,8)	15 (68,2)	0,07
Yes	64	74,4	27 (42,2)	37 (57,8)	
Choice of analgesia and sedation*					
Midazolam + Fentanyl	60	75,9	14 (23,3)	46 (76,7)	0,002
Dexmedetomidine	19	24,1	13 (68,4)	6 (31,6)	
Assessment, prevention and management of delirium *					
No	35	40,7	07 (20,0)	28 (80,0)	0,002
Yes	51	59,3	27 (52,9)	24 (47,1)	
Early mobilization *					
No	45	52,3	15 (33,3)	30 (66,7)	0,04
Yes	41	47,7	19 (46,3)	22 (53,7)	
Family involvement *					
No	41	47,7	09 (22,0)	32 (78,0)	<0,001
Yes	45	52,3	25 (55,6)	20 (44,4)	

Note: *Missing.

Table 4. Explanatory model of protective and risk factors for delirium in patients in an Intensive Care Unit. Rio Branco, AC, Brazil, 2019-2020

Variable	Gross Hazard Ratio (IC95%)*	Adjusted Hazard Ratio [†] (IC95%)*
Alcoholism	3,52 (1,59 – 7,79)	3,62 (1,63 – 8,04)
Physical restraint	2,47 (1,24 – 4,91)	3,08 (1,46 – 6,47)
Functional dependence before hospitalization	3,96 (0,94 – 16,69)	3,91 (0,92 – 16,53)
Length of stay ≥14 days	2,73 (1,25 – 5,97)	2,76 (1,23 – 6,21)
Mechanical ventilation time ≥7 days	6,82 (2,49 – 18,67)	7,07 (2,52 – 19,84)
Assessment, prevention and management of pain	0,40 (0,18 – 0,91)	0,41 (0,18 – 0,92)
Sedation interruption + TRE‡	0,48 (0,20 – 1,12)	0,41 (0,16 – 1,01)
Choice of analgesia and sedation: dexmedetomidine	0,31 (0,14 – 0,68)	0,32 (0,14 – 0,71)
Assessment, prevention and management of delirium	0,30 (0,13 – 0,70)	0,30 (0,13 – 0,71)
Early mobilization	0,51 (0,25 – 1,02)	0,51 (0,25 – 1,05)
Family involvement	0,27 (0,12 – 0,60)	0,26 (0,12 – 0,59)

Note: *Adjusted by the sedation variable; [†]IC95% = 95% confidence interval; ‡Spontaneous Breathing Test.

Discussion

The incidence of 62.6% of delirium in the ICU was high, and the risk factors were alcohol consumption, use of physical restraint, longer hospital stay and mechanical ventilation. Protective factors for delirium were the ABCDEF bundle items: pain assessment, prevention and management; choice of analgesia and sedation (dextomedetunidine); assessment, prevention and management of delirium and family involvement.

The incidence of delirium in the ICU is high because, when compared with a systematic review with meta-analysis with 42 articles, only 8 (25.0%) identified an incidence of delirium above 60%[1].

Delirium is considered a risk factor for early death, in addition to increasing the length of hospital stay and mechanical ventilation. The presence and duration of delirium are risk factors for long-term cognitive impairment in patients who have overcome critical illness[2]. Intensive care professionals must be able to recognize patients at risk for delirium and be trained in the application of the CAM-ICU, as early diagnosis and treatment improve clinical outcomes and help to reduce adverse events associated with health care[1,14].

Alcoholism is a harmful habit and considered a risk factor for delirium[14]. A study carried out with 184 patients with delirium in an ICU of a hospital in Uruguay revealed, among others, that the history of alcohol consumption was an independent risk factor for its onset. In addition, the researchers found that drinking and old age were related to each other[5].

Culturally, alcoholism is more practiced by men. In this sample, 74.7% of the men were alcoholics, whose association is already described in the literature and deserves the intervention of the multidisciplinary team, as

well as attention at the time of the anamnesis at the admission of the patient to the ICU[5,8,9,10,14].

Physical restraint is a risk factor for delirium[9,12]. The routine of the studied unit is to use restraint in all intubated patients. The restraint of the patient to the bed demonstrates a fear of responsibility in the event of an adverse event such as accidental extubation, removal of invasive devices and the patient's fall. Thus, physical restraint is used before delirium occurs[15]. Containment is rarely addressed in the literature, so each team implements its own strategies and knowledge is passed on, often without scientific knowledge. It is recommended that physical/mechanical restraint should be used only when it is the only possible means of preventing harm to the patient or others[11,15].

The incidence of delirium is also associated with longer duration of mechanical ventilation and days of ICU stay[1,16]. A cohort identified that the duration of mechanical ventilation was a predictor of delirium[5]. Another study carried out in 68 federal university ICUs in the United States and Puerto Rico, in which 15,226 adult patients were evaluated over a period of 20 months using the ABCDEF bundle, the full use of the ABCDEF bundle was associated with a lower probability of seven clinical outcomes, among them, delirium (Odds Ratio 0.60; CI 0.49 – 0.72)[10].

In Brazil, the implementation of the bundle faces barriers associated with the lack of team training, continuing education on the subject and lack of professional updating, whose barriers deserve to be addressed in order to reduce the incidence of delirium in critically ill patients[9].

The presence of family members was a protective factor against delirium in this ICU. In this sense, it is necessary to include the family in the daily care of the patient. Extended visiting hours should be encouraged in order to stimulate memory, reduce isolation and family breakdown of the patient who is hospitalized in the ICU[16,17].

Studies have shown that the presence of family members actively involved in the care process results in a reduction in the incidence of delirium[17]. The family's participation in daily care in the ICU contributes to a better understanding of the situation of their relative's illness, as well as knowledge about the care routine to be performed at home, in addition to welcoming the family member to the patient[6]. In the ICU studied, from the moment the patient on mechanical ventilation presented RASS -3 or higher, the possibility of family participation was discussed. Subsequently, the most suitable family member to be with the patient was chosen, as well as all guidance on their role in the unit by the unit's psychologist.

Pain control is essential for the prevention of delirium and must occur daily in the ICU; however, measures must be taken to prevent the patient from deeply sedating the patient, as it can impair early awakening, as well as patient orientation[8-10]. Pain assessment is the first step before considering treatment. Its classification is given by the numerical pain scale, which ranges from 0 to 10, where 0 means no pain and 10, severe pain[9]. In cases of patients who are unable to report pain, physiological parameters such as heart rate (HR), blood pressure (BP), respiratory rate

(Rf) and oxygen saturation (SpO_2) can guide the assessment[11,15]. Pain assessment was performed using these scales and management was mainly drug-based.

Sedation management is a primary measure in the intensive care setting. The strategy of interruption of sedation in eligible patients is of fundamental importance and should be evaluated through multidisciplinary visits/rounds, to assess daily awakening and allow the patient to interact. This measure can reduce the time of mechanical ventilation, ICU stay and delirium[5,9,11,12].

The best analgesia strategy is related to extubation and early awakening. Benzodiazepines are the most used class for this purpose; however, their use can increase the risk of delirium and the length of stay in the ICU. Studies have shown that benzodiazepines and opioids have been associated with higher rates of delirium, whereas when their use is reduced, the incidence of delirium decreases[5,12].

Thus, dexmedetomidine hydrochloride has been indicated in ICU patients because it guarantees sedation without having the deleterious effects of a benzodiazepine, such as depression of the respiratory center and deep sedation[9]. The Pain, Agitation, Delirium, Immobility and Sleep Disruption (PADIS) guidelines suggest that non-benzodiazepine sedatives such as propofol and dexmedetomidine are more suitable than benzodiazepines (midazolam) in mechanically ventilated adults, aiming at shorter duration of sleep. hospitalization and mechanical ventilation and, consequently, delirium[15]. Propofol was not administered to any patient in the sample of this study due to its unavailability at the unit, which is an administrative and managerial issue.

Any professional from the multidisciplinary team can perform the detection of delirium, and therefore, it is essential that everyone is qualified and trained to apply the scales and the assessment of delirium. This assessment should be done on each shift or as soon as the patient shows a change in mental status[9,10].

Non-pharmacological strategies play a key role in the prevention and management of delirium. Some reversible factors must be considered before considering administering a drug, such as toxic situations, hypoxemia, infection, immobilization and fluid and electrolyte imbalance[9,10]. The assessment, prevention and management of delirium was done in a secondary way in order to control other factors such as daily interruption of sedation, to start spontaneous breathing test (SBT) and early mobilization. However, risk factors for delirium were minimized, which demonstrates that interventions specifically aimed at preventing delirium are needed.

Another important multidisciplinary care in the ICU is to minimize the interruption of the patient's sleep during the night, as it increases the chance of delirium. The reduction of brightness and noise of the multiparameter monitor contributes to a good sleep, as well as other preventive measures such as orientation in time and space, clarification on the procedures to be carried out and on the devices in use[18,19].

Early mobilization is a safe therapy, indicated for the patient in the ICU, and has recently been considered an

indicator of quality of care in ICUs in Germany[20]. The indicator emphasizes the early start of activities that must be defined according to the standards of each unit, whether with the use of a cycle ergometer in bed, sitting on the edge or outside the bed, orthostatism, ambulation, among other activities, always considering the individual limitations and distinctions[9,21]. However, the success of a mobilization program requires team collaboration and breaking down structural, procedural and cultural barriers. Early mobilization and the other items in the ABCDEF bundle are essential to prevent the occurrence of delirium in ICU patients, so, with the results of this study, it is expected to contribute to the beginning of the training and qualification of employees on delirium, the , and initiation of a routine assessment and daily interventions aimed at reducing the incidence of delirium in this ICU.

This study has as a limitation the assessment of pain, since it is performed only by the simple analog scale. Likewise, the evaluation of days with delirium and the occurrence of mixed delirium was not performed, being recommended in future studies.

However, this study has strengths with the follow-up of a prospective cohort of critically ill patients on mechanical ventilation with assessment by the RASS and CAM-ICU scales, considered the gold standard in the assessment of delirium in sedated, artificially ventilated and ICU patients. In addition, the identification of the high incidence of delirium suggests that interventions based on the results that provided scientific evidence for the use of the ABCDEF bundle should be adopted to reduce the occurrence of delirium in the unit. Research directed at safety incidents secondary to delirium is suggested as a predictor of adverse events, since early recognition can accelerate the most appropriate clinical intervention.

Conclusion

The incidence of delirium identified is high and the risk factors deserve immediate intervention, as well as the use of the ABCDEF bundle to reduce the incidence of delirium in the unit. However, training and qualification of the multidisciplinary team are essential for the assessment and early diagnosis of delirium, as well as for the assessment of daily awakening, type of sedative used, daily decrease in sedation, mechanical ventilation time and permanence of patients in intensive care unit.

References

1. Salluh JIF, Wang H, Schneider EB, Nagaraja N, Yenokyan G, Damluji A et al. Outcome of delirium in critically ill patients: systematic review and meta-analysis. BMJ. 2015;350:h2538. https://doi.org/10.1136/bmj.h2538
2. Yang J, Zhou Y, Kang Y, Xu B, Wang P, Lv Y, Wang Z. Risk Factors of Delirium in Sequential Sedation Patients in Intensive Care Units. BioMed Research International. 2017;2017:3539872. doi: 10.1155/2017/3539872
3. Ely EW, Margolin R, Francis J, May L, Truman B, Dittus R, et al. Evaluation of delirium in critically ill patients: Validation of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). Crit Care Med. 2001;29(7):1370-79. doi: 10.1097/00003246-200107000-00012
4. American Psychiatric Association (APA). Diagnostic and statistical manual of mental disorders. 5th ed. Washington: APA; 2013.
5. Mesa P, Previgliano IJ, Altez S, Favretto S, Orellano M, Lecor C, et al. Delirium in a Latin American intensive care unit. A prospective cohort study of mechanically ventilated patients. Rev Bras Ter Intensiva. 2017;29(3):337-45. doi: 10.5935/0103-507X.20170058
6. Chaves RGR, Souza FGM, Silva ACO, Santos GFL, Fernandes HIVM, Cutrim CMS. Importance of the family in the care process: attitudes of nurses in the context of Intensive Therapy. Rev enferm UFPE on line. 2017;11(12):4989-98. http://dx.doi.org/10.5205/1981-8963-v11i12a22285p4989-4998-2017
7. Bastos AS, Beccaria LM, Silva DC, Barbosa TP. Prevalência de delirium em pacientes de terapia intensiva e associação com sedoanalgesia, gravidade e mortalidade. Rev Gaúcha Enferm. 2020;41:e20190068. https://doi.org/10.1590/1983-1447.2020.20190068
8. Junior RFM, Costa AN, Maneschy RB, Pontes CDN, Silva YJA, Holanda LS, et al. Main risk factors for delirium found in elderly patients inside the nurses of medical clinics of an Amazon hospital. Revista Eletrônica Acervo Saúde. 2019;17:1-8. https://doi.org/10.25248/reas.e272.2019
9. Marra A, Ely EW, Pandharipande PP, Patel MB. The ABCDEF Bundle in Critical Care. Crit Care Clin. 2017 Apr; 33(2):225–43. doi: 10.1016/j.ccc.2016.12.005
10. Pun BT, Balas MC, Barnes-Daly MA, Thompson JL, Aldrich JM, Barr J, et al. Caring for Critically Ill Patients with the ABCDEF Bundle: Results of the ICU Liberation Collaborative in Over 15,000 Adults. Crit Care Med. 2019;47(1):3–14. doi: 10.1097/CCM.0000000000003482
11. Ribeiro CJN, Araújo ACS, Brito SB, Dantas DV, Nunes MS, Alves JAB, Ribeiro MCO. Pain assessment of traumatic brain injury victims using the Brazilian version of the Behavioral Pain Scale. Rev Bras Ter Intensiva. 2018;30(1):42-9. https://doi.org/10.5935/0103-507X.20180009
12. Mori S, Takeda JRT, Carrara FSA, Cohrs CR, Zanei SSV, Whitaker IY. Incidence and factors related to delirium in an intensive care unit. Rev Esc Enferm USP. 2016;50(4):585-91. https://doi.org/10.1590/S0080-623420160000500007
13. Medronho R, Bloch KV, Luiz RR, Werneck GL (eds.). Epidemiologia. 2. Ed. São Paulo: Atheneu; 2009.
14. Luna AA, Bridi AC, Silva RCL. Delirium in Intensive Care – a retrospective study. Rev enferm UFPE on line. 2015;9(1):69-75. doi: 10.5205/reuol.6817-60679-1-ED.0901201510
15. Devlin JW, Skrobik Y, Gélinas C, Needham DM, Slooter AJC, et al. Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption in Adult Patients in the ICU. Crit Care Med. 2018;46(9):825-73. doi: 10.1097/CCM.0000000000003299
16. Pessoa LSC, Menezes TMO, Gomes NP, Pereira GS, Batista VM, Alencar LMV. Nursing care for elderly patients with delirium in Intensive Care Units. Rev enferm UFPE on line. 2019;13:1-7. http://dx.doi.org/10.5205/1981-8963.2019.239682

17. Morandi A, Piva S, Ely EW, Myatra SN, Salluh JIF, Amare D, et al. Worldwide survey of the "assessing pain, both spontaneous awekening and breathing trials, choice of drugs, delirium monitoring/management, early exercise/mobility, and Family empowerment" (ABCDEF) bundle. Critic Care Med. 2017;45(11):e1111-22. doi: 10.1097/CCM.0000000000002640

18. Faustino TN, Pedreira LC, Silva RMO, Freitas YS. Knowledge and practice of the nursing team for the prevention and monitoring of delirium in the elderly. Revista Baiana de Enfermagem. 2016;30(3):1-10. http://dx.doi.org/10.1590/0034-7167.2016690416i

19. Pereira JM, Barradas FJR, Sequeira RMC, Marques MCMP, Batista MJ, Gadelhas M, Santos MS. Delirium in critically ill patients: risk factors modificable by nurses. Revista de Enfermagem Referência. 2016;9:29-36. http://dx.doi.org/10.12707/RIV16006

20. Kumpf O, Braun JP, Brinkmann A, Bause H, Bellgardt M, Bloos F, et al. Quality indicators in intensive care medicine for Germany – third edition. German Medical Science. 2017;15(10):1-29. doi: 10.3205/000251

21. Aquim EE, Bernardo WM, Buzzini RF, Azeredo NSG, Cunha LS, Damasceno MCP et al. Brazilian Guidelines for Early Mobilization in Intensive Care Unit. Rev Bras Ter Intensiva. 2019;31(4):434-43. doi: 10.5935/0103-507X.20190084