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THE ASSESSMENT OF DELIRIUM IN PATIENTS WITH STROKE IN AN INTENSIVE CARE UNIT – INTEGRATIVE LITERATURE REVIEW

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Abstract: Introduction: Cerebral Vascular Accident (CVA) causes changes at various levels in users, which can trigger delirium. However, it appears that identifying delirium in the initial phase of stroke is difficult in the presence of neurological deficits. For this reason, delirium is a common complication in an Intensive Care Unit (ICU), making regular monitoring of users' signs/symptoms crucial, with the need to use credible assessment instruments. **Objectives:** Analyze delirium assessment instruments; select the best scale to assess delirium in patients with stroke; identify obstacles that hinder the application of delirium assessment tools in patients with stroke. **Methodology:** This is an Integrative Literature Review, for which electronic databases such as Medline and CINHAL were used to carry out the research, using the PI[C] O method, and, finally, seven articles were selected scientific studies with a publication time frame between 2019 and 2021. **Results**: Ischemic stroke (IS) has a higher incidence. When applying instruments to assess the presence of delirium, the Confusion Assessment Method for Intensive Care Unit (CAM-ICU) is the instrument that presents the most limitations, as it requires interaction with users, unlike the Intensive Care Delirium Screening Checklist (ICDSC) which is observational. Still, other articles refer to the Confusion Assessment Method (CAM) and the Montreal Cognitive Assessment (MoCA) as more appropriate instruments. **Conclusion:** Delirium is often difficult to detect, as many cases can go unnoticed, especially in patients with stroke. Therefore, the currently existing assessment instruments were analyzed and it was found that the most used is the CAM-ICU, considering that it is not entirely suitable due to its limited capacity to explain an initial mental state that presents changes. The obstacles that make assessment most difficult are the neurological deficits present in patients with stroke, which can be confused with signs/symptoms related to delirium.
Keywords: Delirium; Intensive Care Unit; Stroke

INTRODUCTION

In a Cerebral Vascular Accident Unit (UAVC), several complications and emerging diseases are often detected that are associated with acute stroke, thus reducing hospitalization time and improving the treatment of users. However, users admitted to a UAVC find themselves in an unfamiliar and physically uncomfortable environment, where they are separated from their family members and subjected to various invasive and non-invasive procedures, causing psychological pressure and restlessness, which can enhance the development of delirium. (Song, Lee & Jung, 2018).

The American Psychiatric Association (2013) - in the Diagnostic and Statistical Manual of Mental Illnesses and Disorders, 5th edition, (DSM-5) - defines delirium based on five main criteria: (1) disturbance in consciousness and attention; (2) develops over a short period of time, with a tendency to fluctuate during the day; (3) additional disturbance in cognition; (4) symptoms that are not justified by another pre-existing, evolving or established neurocognitive disorder and that do not occur in the context of a severely reduced level of stimulation, such as coma; and (5) there is a medical/family history, physical examination/laboratory tests that the disorder is caused by a medical condition and substance intoxication/ withdrawal/medication side effect. It is a psychiatric syndrome, reiterated mainly in hospitalized individuals, with a prevalence of 10% to 25% in all acute admissions to general hospitals. (Qu et al., 2018).

Hofen-Hohloch et al. (2020), states that delirium results from the interaction of the

user's particularities (e.g.: frailty, low cognitive reserve and brain damage) with exogenous factors (e.g.: medications, infections and stress).

Therefore, this mental disorder is a common complication in an ICU, being associated with longer hospital stays and greater morbidity and mortality. It must be noted that delirium is made up of three subtypes: hyperactive, hypoactive and mixed. According to the evidence described in some studies, the hyperactive type is characterized by severe confusion, disorientation, motor agitation and restlessness, being present in 1.6% of cases. The hypoactive type is characterized by periods of motor slowdown, social isolation, apathy, decreased speed of actions and decreased speech, the prevalence of which is 43.5%. Finally, a higher prevalence (54.1%) of mixed delirium stands out, in which symptoms fluctuate between hyperactive and hypoactive delirium. (Czyzycki, et al., 2022; Park e Lee, 2019).

(Kotfis, Bott-Olejnik, Szylińska, Listewnik & Rotter, 2019; Qu et al., 2018).

With regard to stroke, the topic of delirium is pertinent, as stroke is a neurological emergency that can lead to serious immediate and long-term physical, emotional and cognitive complications, where delirium is highlighted, which is an acute neuropsychiatric syndrome. which occurs in around 10% to 48% of users who have suffered a stroke. It must be noted that individuals with delirium after a stroke spend a longer period in hospital and are also 4.7 times more likely to die. On the other hand, in the first year after the stroke episode, users may present worse functional results with negative consequences on the quality of life of these individuals. Another relevant aspect to be addressed throughout the document is the fact that it is particularly difficult to identify delirium, especially in the initial phase of stroke, since several characteristics of delirium resemble a wide range of neurological signs and symptoms that are taken into consideration in delirium assessment scales/instruments (Kotfis, Bott-Olejnik, Szylińska, Listewnik & Rotter, 2019; Reznik, et.al., 2020b).

According to what was explained on the topic "Assessment of post-stroke delirium", the problem question "What is the influence of delirium assessment on the early identification of these episodes in patients with stroke, in an ICU?" was created, with the aim of obtaining response to the following objectives: (a) list the instruments for assessing delirium; (b) select the best scale to assess delirium in patients with stroke and (c) identify obstacles that hinder the application of delirium assessment instruments in patients with stroke.

METHODOLOGY

The EBP requires nurses to have the ability to provide quality healthcare, requiring knowledge, understanding and skills in searching for relevant evidence, with the aim of bridging the dichotomy between theory and practice - research and care. Thus, EBP emerges as a systematic and safe way of establishing professional conduct with a focus on identifying and solving problems, using scientific evidence with methodological rigor and good internal and external validity. (OE, 2012; Silva et al., 2021).

In this context, the Integrative Literature Review Methodology will be used as a method of analyzing the selected articles, with the objectives of enumerating delirium assessment instruments, selecting the best scale to assess delirium in patients with stroke and identifying the obstacles in the application of delirium assessment tools in stroke patients. To formulate the problem question, we used the PI[C]O method, described in Table 1, where each initial of this acronym is essential for elaborating the problem question. So,

according to Joanna Briggs Institute (2014), this mnemonic translates into: P – Participants; I – Interventions; C – Comparisons (between variables) and O – Outcomes (Results).

P	Participants	Patients with stroke in an ICU
I	Interventions	Delirium assessment
C	Comparisons	Not applicable
O	*Outcomes*	Early identification of delirium

Table 1 – Method: PI[C]O

The description of the article search strategy and the establishment of inclusion and exclusion criteria in a RIL are fundamental in obtaining relevant primary articles. These aspects become crucial to guarantee the internal validity of the RIL, allowing the generalization of the Conclusions obtained to a wider Population (Sousa, Marques-Vieira, Severino & Antunes, 2017).

In order to obtain scientific evidence that addressed the topic under analysis, some inclusion criteria (Table 2) and exclusion criteria (Table 3) were defined.

Category	Inclusion criteria
Population	Patients with stroke, aged over 18 years, in an ICU
Interventions	Articles on instruments for assessing delirium in people with stroke and early identification of it
Temporal space	Articles published in the last 5 years - between 2018 and 2022
Idiom	Articles in Portuguese, Spanish and English

Table 2 - Inclusion criteria

Category	Exclusion Criteria
Population	Users in pediatric context and/or with Covid-19
Interventions	Articles that refer to interventions that fall to other health professionals
Study project	Secondary studies
Others	Duplicate articles

Table 3 - Exclusion Criteria

Taking these criteria into consideration and in accordance with the structured PICO method, the bibliographic research began on April 9, 2022, and continued until May 14, 2022. Search engines such as Pubmed and EBSCO, and electronic databases, Medline and CINHAL. To do this, we used DeCS/ MeSh descriptors such as: "intensive care unit", "stroke" and "delirium" and the keywords: "intensive care unit" or "stroke care unit"; "delirium" or "delirium screening" or "delirium diagnosis", "stroke" or "stroke patients", using the following Boolean operators: "AND" and "OR". Using the keywords and Boolean operators, the following search expressions were developed: (1) "stroke care unit" [Title/Abstract] OR "intensive care unit" [MeSH Terms] AND "stroke" [MeSH Terms] AND "delirium" [MeSH Terms]; (2) "stroke" [Abstract] AND "delirium" [Title] OR "poststroke" [Title] AND "poststroke" [Abstract] AND "intensive care unit" [Text].

In this research, 382 Results were obtained. Of these, after excluding repeated articles (41 articles) and applying the inclusion and exclusion criteria, 130 articles emerged. Then, according to the reading of the titles and abstracts, 29 articles were selected, and after their full reading, only 7 articles were selected that incorporated the monograph. For better understanding, in Figure 1, there is a flowchart with the selection of chosen articles, acquired through research carried out on Medline and CINHAL.

According to the flowchart presented, 7 articles were selected and identified in Table 4, according to the database from which it was chosen, that is, "M" refers to MEDLINE and "C" to CINHAL. The articles are numbered in chronological order, as well as the title, authors, year and source of publication.

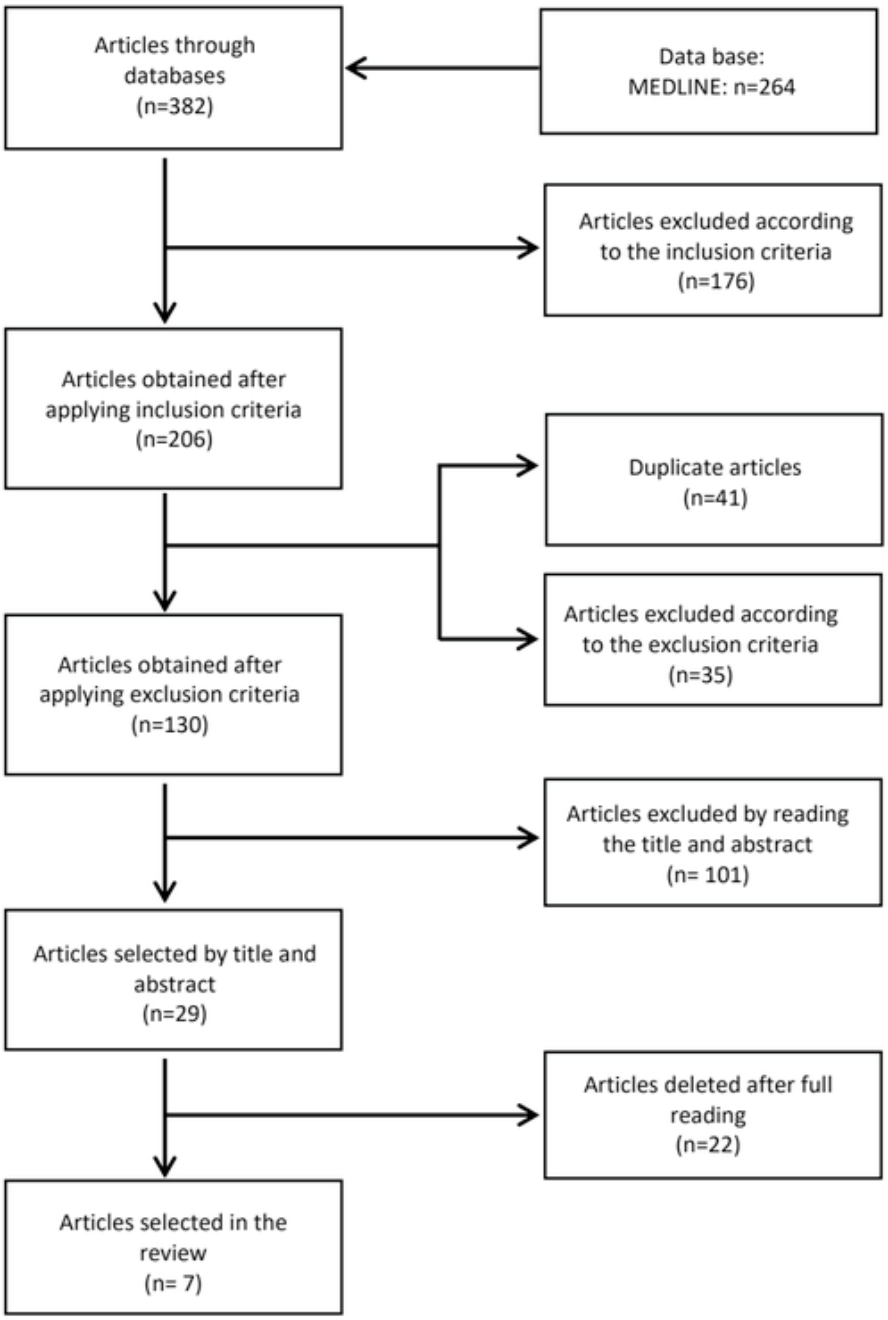

Figure 1 - Article selection flowchart for RIL (prepared by the authors)

Title	Authors and year of publication	Publication
M1: *Poststroke Delirium Clinical Motor Subtypes: The Prospective Observational Polish Study (PROPOLIS)*	Pasinska, P, Kowalska, K., Klimiec, E., Wilk, A., Szyper-Maciejowska, A., Dziedzic, T. & Klimkowicz-Mrowiec, A. (2019)	*The Journal of Neuropsychiatry and Clinical Neurosciences*
M2: *Fluctuations of consciousness after stroke: Associations with the confusion assessment method for the intensive care unit and potential undetected delirium*	Reznik, M., Daiello, L., Thompson, B., Wendell, L., Mahta, A., Potter, N., Yaghi, S., Levy, M., Fehnel, C., Furie, K. & Jones, R. (2020)	*Journal of Critical Care*
M3: *Delirium Screening in Neurocritical Care and Stroke Unit Patients: A Pilot Study on the Influence of Neurological Deficits on CAM-ICU and ICDSC Outcome*	Hofen-Hohloch, J., Awissus, C., Fischer, M., Michalski, D., Rumpf, J. & Classen, J. (2020)	*Neurocritical Care Society*
M4: *Development of a clinical score, PANDA, to predict delirium in stroke care unit*	Nakamizo, T., Kanda, T., Kudo, Y., Sugawara, E., Hashimoto, E., Okazaki, A., Usuda, M., Nagai, T., Hara, H. & Johkura, K. (2020)	*Journal of the neurological sciences*
M5: *Identifying Delirium Early after Stroke: A New Prediction Tool for the Intensive Care Unit*	Haight, T. & Marsh, E. (2020)	*Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association*
M6: *Delirium in acute stroke: A prospective, cross-sectional, cohort study*	Rollo, E., Callea, A., Brunetti, V., Vollono, C., Marotta, J., Imperatori, C., Frisullo, G., Broccolini, A., & Della Marca, G. (2021)	*European journal of neurology*
C1: *Course and Recognition of Poststroke Delirium: A Prospective Noninferiority Trial of Delirium Screening Tools*	Fleischmann, R., Warwas, S., Andrasch, T., Kunz, R., Witt, C., Mengel, A., & von Sarnowski, B. (2021)	*Stroke*

Table 4 - - Articles under analysis

M1. Title: *Poststroke Delirium Clinical Motor Subtypes: The Prospective Observational Polish Study (PROPOLIS)* (2018)	
Study project	Prospective observational study
Population	750 users with stroke or transient ischemic attack (TIA) admitted to a UAVC
Context	UAVC at the Kraków University Hospital, Poland
Study goals	• Evaluate the frequency of delirium subtypes in patients with stroke, within 7 days of hospitalization; • Develop predictive models for subtypes of delirium, identifying users at risk of developing this condition.
Methodology	Users were evaluated every day, from hospital admission until the 7th day of hospitalization. An abbreviated version of the CAM was used to screen for delirium, while the CAM-ICU was used for users with speech impairment. The type of delirium was also classified, according to the Delirium Motor Subtype Scale. On the other hand, to identify possible delusional symptoms during the 24 hours (h), a questionnaire was applied to each user, about their behavior and their cognitive fluctuations. To screen for pre-stroke dementia, a Polish version of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) was used. The MoCA, Frontal Assessment Battery and Cognitive Test for Delirium were also used between the 1st and 2nd day and on the 7th day after hospital admission. The diagnosis of delirium was concluded based on these instruments and clinical signs, taking into consideration the DSM-5 criteria. Severity of clinical deficit was classified using the National Institutes of Health Stroke Scale (NIHSS) at the time of hospital admission.
Results	Of the study sample (750 users), 650 users had a stroke, 52 had a hemorrhagic stroke (CHVA) and 48 had a TIA. Of the 203 users with delirium, the hyperactive type was identified in 15.27%, hypoactive in 41.87%, mixed type in 39.93% and unspecified in 4.93%. According to the predictive model and the MoCA score, hypoactive delirium presents visual disturbances, leukocyte count during hospitalization, anticoagulant therapy and spatial neglect syndrome. Several predisposing factors for hyperactive delirium have been identified, such as diabetes mellitus, urinary bacteremia, spatial neglect. For mixed delirium, the MoCA score highlights spatial neglect, atrial fibrillation (AF) and comorbidity index as model predictors.

Conclusions	This study demonstrated a higher prevalence of the hypoactive delirium subtype among patients with stroke, followed by a mixed type that was almost as common as the hypoactive delirium. Mixed-type delirium was identified in 39.9% of all cases, suggesting that changes in the psychomotor activity of patients with stroke are frequent and that signs of mental or motor hyper/hypoactivity often coexist. It was found that the MoCA score on the 1st day of hospitalization, as well as spatial neglect, were the predictive factors in all subtypes of delirium. In the predictive model, the best predictive values for hyperactive and mixed type delirium were diabetes, AF and infections.
Study limitations	Restricted observation for 7 days, which makes it impossible to identify delirium when it starts late.
Authors' suggestions	The Results may encourage further studies of prevention of post-stroke delirium.

Table 5 – Summary of the M1 study

M2. Title: ***Fluctuations of consciousness after stroke: Associations with the confusion assessment method for the intensive care unit and potential undetected delirium*** **(2020)**	
Study project	Retrospective cohort study
Population	2,132 users with stroke or sepsis (2008-2012)
Context	Patients admitted to an ICU, Beth Israel Deaconess Medical Center, with acute stroke (Israel).
Study goals	Determine the role of fluctuating consciousness in identifying delirium
Methodology	All documented data from the CAM-ICU and Richmond Agitation Sedation Scale (RASS) assessments of users were extracted, which were carried out by nurses upon admission. The selected Population includes users with stroke and sepsis, as users with sepsis served as comparators, as they represent a relatively heterogeneous and representative ICU Population, and which is relatively unlikely to have new focal neurological deficits.
Results	2,132 users were identified, 546 of whom had a stroke (55% hemorrhagic, 45% ischemic) and 1,586 acquired sepsis. Among all study users, there was a significantly higher proportion of positive evaluations for CAM-ICU (18% vs. 9%) and "unable to assess" (UTA) (32% vs. 13%) in patients with stroke compared with those with sepsis. Mean 24-h RASS variability was significantly higher on days when CAM-ICU positive or UTA compared to days when CAM-ICU negative. It is highlighted that 48% of CAM-ICU and UTA assessments in patients with stroke would have corresponded to probable delirium based on RASS variability. This equates to an additional 108 stroke users with probable delirium, suggesting that 38% of stroke users with probable delirium may not have been detected.
Conclusions	The degree of fluctuation in consciousness was notably more prominent in patients with stroke. Furthermore, they were significantly more likely to be classified as positive for CAM-ICU or UTA compared to patients with sepsis. The high rate of UTA assessments is especially concerning as half of UTA assessments in stroke patients may mask undetected delirium. Having said this, it can be determined that patients with stroke face a high risk of having delirium that is not detected by the CAM-ICU, however they may present fluctuations in consciousness that can be captured by the RASS.
Study limitations	• Acquisition of data from a single clinical center may not be generalizable; • The two study groups represent heterogeneous samples, which may imply the presence of uncontrolled clinical differences; • RASS variability may represent an imperfect marker in patients receiving sedation, as it may lead to the desirable effect of low levels of RASS variability or encourage nurses to document a value within the stated objective rather than the assessed score.
Authors' suggestions	More studies are needed to characterize the challenges that these users present during assessment and to develop new diagnostic tools that are widely applicable to patients with stroke and other forms of brain injury.

Table 6 - Summary of the M2 study

M3. Title: ***Delirium Screening in Neurocritical Care and Stroke Unit Patients: A Pilot Study on the Influence of Neurological Deficits on CAM-ICU and ICDSC Outcome*** **(2020)**	
Study project	Prospective, observational study
Population	123 users admitted to the Neurocritical Care and Stroke Unit
Context	UAVC and Neurocritical Care at the Department of Neurology, University Hospital Leipzig, Germany
Study goals	Determine how neurological deficits affect the application of delirium assessment tools in critically ill patients.

Methodology	The study was carried out over a period of 31 consecutive days, with assessments completed once daily within 24 hours from admission until discharge from the ICU or death. Delirium screening using the CAM-ICU, ICDSC and International Classification of Diseases (ICD-10) criteria was assessed daily for each user. The level of consciousness was also assessed by RASS.
Results	Of the total study sample (n=123), 72 users were diagnosed with stroke, 3 users were admitted with CHVA and 18 with TIA. The incidence of delirium over 31 days was 18.7%. The incidence of CAM-ICU delirium was 23.6%, and the incidence of ICDSC delirium was 26.8%. The incidence of delirium was 13%, according to ICD-10 criteria. Of the 644 daily screenings, delirium was diagnosed in 130 assessments (20.2%) according to clinical team assessment, while 115 assessments (17.9%) were classified as "not evaluable" due to persistent coma and global aphasia. A positive assessment of delirium was observed in 135 assessments (21%) with CAM-ICU and in 137 assessments (21.3%) with ICDSC. In this population, users presented hypoactive delirium more frequently than hyperactive delirium.
Conclusions	Patients with primary brain injury may be at an even greater risk of developing delirium. Users with a positive CAM-ICU result or ICDSC score ≥ 4 points were more likely to present severe focal neurological deficits, such as expressive aphasia, impaired language comprehension and hemineglect than users with a negative result or score <4. Screening with CAM-ICU was impossible in eight assessments due to global aphasia. In these cases, the ICDSC was applicable due to its different construction, as it is mostly based on observation, while the CAM-ICU is based on interaction with the user.
Study limitations	• The fact that the research was carried out in a single center, generalization to other environments may be limited. • Delirium screening can only be carried out once a day due to team availability, ideally it would be carried out several times a day. • The nature of the study implies that Results must be interpreted with caution.
Authors' suggestions	A more clinically useful delirium assessment instrument would combine observable measures as in the ICDSC with consideration of neurological deficits.

Table 7 - Summary of the M3 study

M4. Title: *Development of a clinical score, PANDA, to predict delirium in stroke care unit* (2020)	
Study project	Prospective Cohort Study
Population	387 users with stroke admitted to an ICU
Context	UCI, stroke center in Yokohama, Japan
Study goals	Develop a tool capable of predicting delirium, in a UAVC, that can be easily evaluated by nurses.
Methodology	A list of potential delirium predictors was created. Upon admission, 20 variables classified into four categories were verified: 1) history of certain conditions that may predispose users to delirium, 2) non-neurological symptoms that may disturb the user's attention, 3) comorbidities that may precipitate delirium and 4) care provided to users during the first 24 hours that could impose physical and/or mental strain on users. For this, a questionnaire was applied that addresses the first two categories. In addition to these variables, five more variables were recorded that refer to the characteristics of the stroke. That said, delirium was assessed using the ICDSC, which assesses a user's state of alertness and mental acuity. To develop a prediction model, 13 of the 27 potential predictors were selected to ensure the reliability of the predictors and the stability of the model, therefore 14 variables were excluded: (a) variables related to care; (b) medical comorbidities, and (c) variables with potentially ambiguous definitions. A prediction model was then developed consisting of five variables – previous delirium, alcohol, stroke severity (NIHSS ≥5), dementia and hearing/visual deficit – which was called "PANDA".
Results	According to the data analyzed, of the 387 participants, 71 suffered stroke and 316 strokes, including 31 TIA. In total, 42 users developed delirium in the first 5 days after admission, with 27 of the users developing delirium on the 1st day, 11 on the 2nd and 3rd day and 4 on the 2nd and 5th day. A prevalence of 11% was found, where most potential predictors were significantly associated with delirium. Delirium was associated with a total number of medical comorbidities and potentially stressful care provided during the first 24 h. Care-related variables were highly correlated with each other and with stroke severity and symptoms.
Conclusions	Delirium was associated with most predisposing factors – dementia, alcohol, hearing/visual impairment, stroke severity and neurological symptoms such as hemiagnosia. For precipitating factors, medical comorbidities and care-related factors were examined. Factors such as physical restraint, catheter placement and factors related to care delivery were highly correlated with stroke severity (high NIHSS).
Study limitations	• Relatively small sample size. • The accuracy of the score depends on the quality of the anamnesis. • Part of the delirium may have developed upon admission and gone unnoticed, which may affect the reliability of the prediction. The score is not externally validated.

Authors' suggestions	No suggestions

Table 8 - Summary of the M4 study

M5. Title: ***Identifying Delirium Early after Stroke: A New Prediction Tool for the Intensive Care Unit*** **(2020)**	
Study project	Cohort Study
Population	102 stroke users admitted to an ICU in the model group/control group and 100 stroke users admitted to an ICU in the model validation group/intervention group.
Context	ICU Neurosciences, Stroke Center in Baltimore, Maryland (USA)
Study goals	The study aims to create a tool to predict delirium in users admitted to an ICU or Intermediate Care Unit (UCINT), after an acute stroke or stroke, according to the risk factors that can be identified upon admission.
Methodology	All users admitted to the ICU developed a stroke or primary intracranial hemorrhage within a 72-hour window prior to admission. During hospitalization, all users were evaluated and underwent complementary diagnostic exams and a clinical examination, where the user's deficits were assessed, applying the NIHSS scale. Once per shift, delirium was assessed using the CAM-ICU scale. The model proposed by the authors consists of calculating the probability of developing delirium according to some variables such as: age over 64 years; intraventricular hemorrhage (HIV); intubation; acute kidney injury (AKI); cognitive deficit and aphasia.
Results	It was found that of the 102 patients with stroke, evaluated with the CAM-ICU, 50% were diagnosed with delirium, that is, positive CAM-ICU at any time during hospitalization. It must be added that 28 of the users had a positive initial CAM-ICU; 31 users required restraint, 12 received therapy to treat delirium and 9 required a safety "assistant" for the user. Of these 102 users, 78 had stroke. The incidence of delirium was higher in the model validation group, in which 70% of users had a positive score on the CAM-ICU at least once during admission, compared to the model group. However, participants who developed delirium in both groups had poor outcomes, i.e., longer length of stay, lower likelihood of discharge to home or acute inpatient rehabilitation, higher NIHSS score at discharge.
Conclusions	According to the data analyzed, it was found that patients with stroke who are over 64 years old, have HIV, intubation, stroke with cognitive dysfunction, aphasia and AKI have a high probability of developing delirium. Therefore, according to these variables, a model was created that allows calculating the probability of a user developing delirium. It was found that the delirium rate determined by CAM-ICU was significantly higher in the validation group than in the model group, 70% and 50%, respectively.
Study limitations	The CAM-ICU limits the early detection of delirium at an earlier stage.
Authors' suggestions	It will be necessary to determine whether identifying patients early and intervening in delirium can reduce the bad outcomes with which delirium is associated. In order to check if delirium is the cause of these results, or if it is just an indicator of susceptible individuals.

Table 9 - Summary of the M5 study

M6. Title: ***Delirium in acute stroke: A prospective, cross-sectional, cohort study*** **(2021)**	
Study project	Prospective, cohort, cross-sectional study
Population	120 users with stroke
Context	UAVC of the Fondazione Policlinico Universitario Agostino Gemelli, Catholic University, Rome, Italy
Study goals	Measure the incidence of delirium in patients with acute stroke, in a UAVC. Determine the clinical characteristics and risk factors related to stroke that predispose patients to delirium.
Methodology	Neurological deficit was assessed at the time of the study and quantified using the NIHSS score. For the diagnosis of delirium, all users were evaluated using the RASS and the CAM-ICU. Assessments were performed on admission and reassessed within 72 h of admission, or at any time in case of altered state of consciousness. According to the incidence of delirium, users were divided into two subgroups: users with delirium (DLR+) and users without delirium (DLR–). All study variables were compared between the DLR+ and DLR- subgroups.

Results	Around 120 users participated in the study, of which 103 developed stroke and 17 brain hemorrhages. The overall incidence of delirium was 30%. Hyperactive delirium was found in 17 cases, hypoactive in 5 cases and mixed type in 14 cases. In the univariate comparison between the subgroups (DLR+, n = 36 vs. DLR−, n = 84), the DLR+ subgroup showed greater impairment of vigilance (8/36 vs. 4/84), disorientation (9/36 vs. 5 /84), gaze palsy (11/36 vs. 5/84), aphasia (18/36 vs. 24/84), FA (15/36 vs. 17/84), cognitive impairment (4/36 vs. 0/84), early need for physical restraint (13/36 vs. 3/84) and use of substances that act on the CNS (9/36 vs. 8/84), when compared with the DLR– group. No significant difference was observed between cerebral ischemia and hemorrhage.
Conclusions	The primary outcome of the present study was the incidence of delirium in acute stroke, as 30% of the sample developed delirium in the acute phase, concluding that delirium is a common complication of this condition. Hypoactive delirium may have gone unnoticed because these users tend to attract less attention. Furthermore, diagnosing a mild form of hypoactive delirium without knowledge of initial cognition is challenging, given that, due to the Sars-Cov-2 pandemic and the resulting restrictions may have contributed to the lack of family feedback on the cognition and behavior of users pre-hospitalization. Another reason that may have made it impossible to detect delirium was due to the presence of aphasia, which was highly represented in the DRL– subgroup. Factors associated with delirium were aphasia, leukoencephalopathy, Chronic Obstructive Pulmonary Disease (associated with changes in sleep patterns) and early use of physical restraint.
Study limitations	The population of stroke patients with cognitive impairment and severe dementia was small. Patients with stroke have neurological impairment that can make it difficult to recognize delirium.
Authors' suggestions	No suggestions

Table 10 - Summary of the M6 study

C1. Title: ***Course and Recognition of Poststroke Delirium: A Prospective Noninferiority Trial of Delirium Screening Tools*** **(2021)**	
Study project	Prospective randomized study
Population	141 users with stroke
Context	UAVC of Hospital Universitário Greifswald, Germany
Study goals	• Evaluate the psychometric properties of established delirium screening tools, comparing their results with DSM criteria-5. • Investigate the natural development of post-stroke delirium and how the frequency of assessment affects its accuracy.
Methodology	All users who were within 24 hours of the onset of stroke or high-risk TIA symptoms were selected. Clinical assessment for delirium was carried out twice a day, lasting a maximum of 7 days or until the patient's discharge or death. Post-stroke delirium screening tools were chosen based on their broad applicability and specifically, due to their popularity, ease of application by nurses, and prior use in stroke studies. They were applied in a random order to avoid sequence effects. The NIHSS was assessed along with all delirium assessments in the first 72 h.
Results	The study presents a sample of 141 users who completed the study. Of these, 7 had a high-risk TIA and 55 had a stroke and developed an episode of delirium. Motor subtypes were hyperactive in 7% of cases, mixed in 58% and hypoactive in 35%. It must be noted that 10% of patients with stroke developed delirium within 24 hours after the onset of the stroke. The simulation revealed that 49.2% of delirium cases would have been missed if screening had been done just once, 34.1% if it had been done twice and 25.3% if it had been done 3 times during the screening period. Daily screenings at a random time would have caused a missed delirium case rate of 5.7%, while daily screenings during morning or afternoon shifts would have caused a missing rate of 7.3% or 3.6%, respectively.
Conclusions	The present study shows that users with high-risk stroke or TIA treated in a UAVC have a high risk of developing delirium in the first 72 hours after the onset of symptoms. Thus, this study determined that delirium affects around 40% of users with acute stroke or high-risk TIA. The CAM was the best screening tool to identify delirium, being the only screening tool not inferior to the gold standard. Its substantial concordance with DSM-5 results and sensitivity and specificity of about 80% make it a suitable screening tool for identifying delirium.
Study Limitations	• The study recruited fewer users than expected, which may have affected the ability to detect differences between the CAM and DSM classifications.5. • The study is monocentric, which affects the generalizability of the results.
Authors' suggestions	The next step would be to carry out a study that also included users with CVA, as it would be impractical to use different tools on different subgroups of users.

Table 11 - Summary of study C1

RESULTS

The previously selected articles comply with the inclusion and exclusion criteria implemented when the scientific evidence search was carried out. That said, the articles chosen are quantitative studies, which took place in the context of UAVC and ICU, where the participants are essentially users with stroke.

Below are the summary tables for each article (Table 5 to 11), which focus on the Study goals, Methodology, Results and Conclusions of the articles under analysis.

In all the studies covered, episodes of delirium occurred. Regarding delirium subtypes, the sample from article M1 showed a higher incidence of hypoactive delirium, followed by mixed and hyperactive delirium. On the other hand, article M6 highlights a higher incidence of hyperactive delirium and article C1, a higher incidence of mixed delirium.

When evaluating the articles under study, the application of several delirium assessment instruments was verified, notably: CAM, CAM-ICU and ICDSC.

Articles M2, M3, M5 and M6 corroborate the same idea, as it was found that users with stroke face a high risk of having delirium that is not detected by the CAM-ICU, as this instrument is based on interaction with users, making the identification of delirium difficult when users have limitations resulting from the stroke, namely aphasia and other neurological deficits. That said, CAM-ICU limits the early detection of delirium at an earlier stage post-stroke. For this reason, the M3 study, using the ICDSC, found that because it is mainly based on user observation, it may be more advantageous when there are neurological deficits, even so, it does not present clinically acceptable sensitivity. In contrast, study C1 states that the CAM instrument was the best screening tool to identify delirium, presenting an especially high detection rate when daily assessments were carried out, showing substantial agreement with the DSM-5 results and sensitivity and specificity of approximately 80%, thus making it a suitable screening tool for identifying delirium.

Article M1 supports the idea that the MoCa instrument better identifies users at risk of delirium among post-stroke survivors than the pre-stroke IQCODE assessment. It was also demonstrated, according to M4 and M6, that there are factors that are associated with the development of delirium, which were consequently highly correlated with stroke severity, i.e., elevated NHISS.

DISCUSSION

In the case of people in critical situations, nursing care in this context must be highly qualified and provided continuously in order to respond to the affected needs, allowing basic life functions to be maintained, preventing complications and limiting disabilities, with the main objective of achieving full recovery.

With regard to the assessment of delirium in patients with stroke, and according to the analysis of article M1, this episode occurred in around 31% of the study population, with a higher prevalence of the subtype of hypoactive and mixed delirium being found. According to the authors of M1, the application of the MoCA instrument better identifies users at risk of delirium among post-stroke survivors than the pre-stroke IQCODE assessment. From another perspective, M2 researchers found that patients with stroke, due to the fluctuation in consciousness that is often present, made them significantly more likely to present a positive CAM-ICU or UTA compared to the comparator group. Even so, it was found that in some cases, due to this fluctuation in consciousness, delirium may not be detected, concluding that around 38% of patients with stroke would have delirium, but it would not

have been previously diagnosed.

Following the same reasoning, the authors of article M3 used different instruments in the same population, verifying different incidences of delirium, depending on the scales used. For this reason, the authors state that delirium may be overlooked in patients with primary brain damage, as progressive impairment of consciousness may be misinterpreted as part of the brain damage rather than additional delirium. Furthermore, users with a positive CAM-ICU result or ICDSC score ≥ 4 points were more likely to present severe focal neurological deficits, such as global aphasia and hemineglect. However, when applying the CAM-ICU it was impossible to obtain a credible result due to global aphasia. In these cases, the ICDSC was still applicable as it is essentially based on observation, while the CAM-ICU is based on interaction with the user.

Due to this difficulty in detecting delirium, even with the application of assessment instruments, most studies state that none of the existing screening tools are capable of detecting delirium in neurocritical patients with clinically acceptable sensitivity. A more clinically useful delirium assessment tool needs to take into consideration the phenotypic overlap between neurological deficits and delirium-related symptoms. For this reason, the CAM-ICU is limited by its inability to care for users with aphasia, executive dysfunction, and other neurological deficits. A possible strategy could be to combine observable measures as seen in the ICDSC with the consideration of neurological deficits, which explains the user's inability to perform certain tasks when aphasia is present or explains inattention when hemineglect exists. (Hofen-Hohloch et al., 2020).

In addition to the application of instruments that help identify delirium, there are predisposing factors such as – dementia, alcohol, hearing/visual impairment, stroke severity and neurological symptoms (hemiagnosia), as can be seen from the analysis of article M4. Along with these factors, there are also precipitating factors that must be taken into consideration, namely medical comorbidities and factors related to the provision of care - physical restraint and placement of catheters - were highly correlated with the severity of the stroke. A prevalence of 11% was found, where most potential predictors were significantly associated with delirium. Thus, it can be assumed, according to the multifactorial model, that stroke can induce delirium directly through predisposing users and indirectly through uncomfortable care acting as precipitating factors. If so, delirium could be prevented by minimizing the amount of care, however, variables related to care may simply be indicators of stroke severity.

The authors of the M5 study verified other preponderant factors for the development of delirium in patients with stroke, such as age over 64 years, presence of HIV, intubation, stroke with cognitive dysfunction, aphasia and AKI. Therefore, depending on these variables, they developed a model that allowed calculating the probability of a user developing delirium. After applying this model, it was found that the delirium rate determined by the CAM-ICU was significantly higher in the validation group than in the model group, 70% and 50%, respectively, due to more severe brain damage.

Other authors corroborate the idea of some articles that state that delirium in the ICU is often associated with factors such as: prolonged hospitalization, invasive procedures, altered state of consciousness and cognitive function and higher mortality. (Mendonça, 2011).

According to article M6, an incidence of delirium was determined to be 30%, but

on the other hand, there were more cases of delirium of the hyperactive subtype than the hypoactive one, as was seen in study M1. According to the authors, this aspect could be due to the fact that hypoactive delirium went unnoticed, as these users tend to attract less attention. Another reason that may have made it impossible to detect delirium was due to the presence of aphasia, as mentioned in other studies, which was highly represented in the DRL– subgroup. It must be added that lack of attention and disorganized thinking are central characteristics of delirium, and which are difficult to identify in the presence of aphasia. According to other authors, neurological changes, especially when associated with large lesions in the left hemisphere of the brain, have been considered predictors of delirium. (Reznik et.al, 2020; Shaw, Walker, Elliott & Quinn, 2019).

It must be noted that to date there are only two studies, Boßelmann et.al. (2019) and Mitasova et.al. (2012), que mencionam a influência dos défices neurológicos, aquando a realização da triagem de delirium, nomeadamente em utentes com AVC, onde se constatou que a afasia influencia o resultado da avaliação do delirium com a aplicação de CAM-ICU ou ICDSC.

From another perspective, Haight e Marsh (2020), consider that in view of the cortical damage present in stroke, the presence of aphasia and neglect is observed, which can, in themselves, trigger delirium, thus there being a correlation between the development of stroke and the emergence of delirium.

In another study, C1, the authors determined that around 40% of patients with acute stroke or high-risk TIA developed delirium. To evaluate this episode, the CAM was used, noting that this was the best evaluation tool to identify delirium, as it has a high detection rate when daily assessments are carried out. Furthermore, it is the only screening tool in accordance with DSM-5 results and with a sensitivity and specificity of around 80%.

Currently, it appears that the most used instrument, adapted to evaluate critically ill patients, intubated and under mechanical ventilation, was the CAM-ICU, which is composed of 4 items: (a) acute onset or fluctuating course; (b) attention disorder; (c) altered level of consciousness and (d) disorganized thinking. This scale is easy to apply, and has high sensitivity (93% to 100%) and specificity (98% to 100%). Even so, its application requires compliance with two steps: (i) evaluating the level of sedation, using the RASS scale and then (ii) evaluating delirium using the CAM-ICU scale, which is more appropriate for patients who do not can communicate (Ely et.al., 2001). The study of Mitasova et al. (2012) revealed that the CAM-ICU was positive on the first day of admission in the majority of patients with stroke who were diagnosed with delirium (67.3%), increasing to 100% after 5 days.

Thus, depending on the articles analyzed and in contrast to other scientific evidence, it appears that delirium is often difficult to detect, as many cases can go unnoticed, especially in patients with stroke, due to language disorders, neglect, disorders mood and cognitive impairment that can be confused with delirium, making adequate assessment impossible. Only systematic monitoring and longitudinal observation can provide reliable answers to questions about disturbances of consciousness (Pasinska et al. 2018).

Another relevant aspect in the analysis of the articles is the fact that they were all carried out in different regions, proposing different cultures. Even so, four of the seven articles under analysis corroborate the idea that the CAM-ICU limits the early detection of delirium due to the presence of neurological deficits, concluding that the nursing care

provided regarding this topic must be similar.

Therefore, Nursing theories/conceptual models aim to carry out adequate data collection in an organized manner, in order to identify changes resulting from the user's clinical condition, implementing nursing interventions and consequently their assessments. (Costa, Luz, Bezerra & Rocha, 2016).

Therefore, and according to the theme under analysis - early assessment of delirium in users with stroke - transitions are present in this phase, as they refer to an intermediate period in a given process, where the user gradually transitions from one condition/ state to another life status. Consequently, the critical situation experienced by users hospitalized in an ICU or UCINT is associated with the health/illness transition, which may subsequently trigger a situational transition experienced by the family, which may have implications for behavior and family roles, making it necessary to redefine of the same (Meleis, 2010).

In this context, apart from the pathology that triggered the patient's hospitalization, when delirium develops, it may further compromise these transitions, hence the importance of early identification of delirium. That said, according to Meleis (2010), nurses are generally the health professionals with the most capacity to identify the transitions experienced by the user and their families, due to the constant transmission of information with the aim of promoting, preventing and intervening in the user's health., in order to achieve a balance of physical, social, mental and spiritual well-being. In short, the user is considered by theorist as a human being with specific needs who is integrated into a characteristic environment and with the ability to adapt to its changes, however, due to his fragility and illness, he experiences an imbalance (Meleis, 2010).

CONCLUSION

This RIL made it possible to carry out a critical analysis of the results of the selected primary studies, delving deeper into the topic under study - Assessment of post-stroke delirium. The results achieved allowed us to determine that early assessment of delirium influences the identification of these episodes in patients with stroke, in an ICU, as it allows early intervention in these events, adopting measures that do not intensify the development of delirium, namely inappropriate use of physical restraints and procedures invasive, also avoiding complications arising from them.

Furthermore, the articles under analysis responded to the previously stipulated objectives, as it was possible to analyze delirium assessment instruments, such as the CAM, CAM-ICU and ICDSC. However, responding to the second objective, it was found that scientific evidence considers that none of the instruments are adequate since they are limited in terms of their ability to explain an initial mental state that presents changes, even so it was found that there is an instrument that, despite not providing a 100% viable answer, is most used in these contexts, this being the CAM-ICU. On the other hand, the application of these instruments in the face of neurological deficits, such as aphasia and changes in executive functions, makes it difficult to assess delirium in stroke patients, thus responding to the third objective previously stipulated.

In the course of carrying out this RIL, it was detected that there are few articles that are capable of giving an objective answer to the research question, however, we consider that, according to the global analysis of the articles, carrying out an early assessment of delirium influences the identification of these episodes in patients with stroke. Consequently, as a

suggestion, for future scientific evidence, we propose investment in studies that address the early identification of delirium in patients with stroke, who are admitted to an ICU. Namely investigations that develop scales/instruments that are easy to apply and sensitive, but that are capable of identifying delirium early and correctly, integrating observable measures as seen in the ICDSC, taking into consideration the possible neurological deficits that may be present in this type of users.

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