DELIRIUM DIAGNOSIS FOR THE CONFUSION ASSESSMENT METHOD IN INTENSIVE CARE UNIT

DIAGNÓSTICO DE DELIRIUM PELO MÉTODO DE AVALIAÇÃO DA CONFUSÃO EM UNIDADE DE CUIDADOS INTENSIVOS

DIAGNÓSTICO DE DELIRIUM POR EL MÉTODO DE EVALUACIÓN DE LA CONFUSIÓN EM LA UNIDAD DE CUIDADOS INTENSIVOS

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ABSTRACT
Objective: To analyze the scientific production on the use of the CAM-ICU scale for the diagnosis of delirium in ICU patients. **Method:** This is an integrative review, with studies between 2010 to 2015, with research conducted in the banks of MEDLINE, IBECS and LILACS, obeying six correlated stages. **Results:** Twelve articles were found, of which 11 (91.6%) approved CAM-ICU as a fast, reliable and effective method for the diagnosis of delirium. On the other hand, only one article (8.3%) reports that the low sensitivity identified in its research hinders the early detection of delirium. **Conclusion:** The CAM-ICU scale in intensive care unit is reliable and easy to apply in daily practice for the diagnosis of delirium and its translation into other languages did not compromise its use and when compared, it was effective in the diagnosis
Descriptors: Delirium; ICU; CAM-ICU

RESUMO
Objetivo: Analisar as produções científicas sobre o uso da escala CAM-ICU para diagnóstico de delirium em pacientes internados em UTI. **Método:** Trata-se de uma revisão integrativa, com estudos entre 2010 a 2015, com pesquisa realizada nos bancos da MEDLINE, IBECS e LILACS, obedecendo seis etapas correlacionadas. **Resultados:** Foram encontrados doze artigos, dos quais 11 (91,6%) aprovaram a CAM-ICU como método rápido, confiável e eficaz para o diagnóstico de delirium. Em contrapartida, apenas 01 artigo (8,3%), relata que a baixa sensibilidade identificada em sua pesquisa dificulta a detecção precoce do delirium. **Conclusão:** A escala CAM-ICU em unidade de terapia intensiva é confiável e de fácil aplicabilidade na prática diária para o diagnóstico de delirium e sua tradução para outros idiomas não comprometeu seu uso e quando comparada, mostrou-se efetiva na realização do diagnóstico.
Descritores: Delirium; UTI; CAM-ICU

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RESUMEN

Objetivo: Analizar la producción científica sobre el uso de la escala CAM-ICU para el diagnóstico del delirio en pacientes de UCI. **Método**: Se trata de una revisión integradora, los estudios entre 2010-2015, a la investigación de los bancos MEDLINE, LILACS IBECS y, tras seis pasos correlacionados. **Resultados:** Doce artículos de los cuales fueron encontrados 11 (91,6%) aprobaron el CAM-ICU como método rápido, fiable y eficaz para el diagnóstico de delirio. En contraste, sólo el 01 artículo (8,3%), informa que la baja sensibilidad identificado en su investigación dificulta la detección temprana del delirio. **Conclusión:** La escala CAM-ICU unidad de cuidados intensivos es fiable y fácil de aplicar en la práctica diaria para el diagnóstico del delirio y su traducción a otros idiomas no comprometer su uso y comparación, se mostró efectividad en el diagnóstico.

Descriptores: Delirium; UCI; CAM-ICU.

INTRODUCTION

Delirium is an organic dysfunction present in intensive care units (ICU) and associated with high mortality, longer hospitalization and mechanical ventilation (MV), as well as functional and cognitive deficits in the long term. It is a predictor of intercurrences such as self-extubation and removal of catheters, which progressively increases the interest in the investigation of this syndrome, given its negative implication for critical patient therapy.[1,2]

In 1980, the tool called *Confusion Assessment Method for Intensive Care Unit* (CAM-ICU) emerged as a diagnostic strategy for delirium based on the main characteristics of the disorder described by the *Diagnostic and Statistical Manual of Menthal Disorders, Fourth Edition* (DSM-IV), since the existing tools had gaps and were complex to use.[3]

In 2001, this tool was adapted for the evaluation of severe patients under MV in ICU. It consists of four items: 1 - acute onset, 2 - inattention, 3 - disorganized thinking, and 4 - altered level of consciousness. The evaluation encompasses observation of the patient's pattern of non-verbal response through their ability to respond to simple commands, picture recognition through the application of the *Attention Screening Examination* (ASE), vigilance and logical yes/no answers to simple questions.[4]

The CAM-ICU is a validated diagnostic tool with high sensitivity and specificity when compared to the criteria considered gold standard. This scale can be applied in non-verbal patients, being translated to and validated in several languages, including Portuguese, thus allowing a wide use in clinical practice.[5] Considering that, this study aims at analyzing the scientific production on the use of the CAM-ICU scale to diagnose delirium in patients admitted to ICU.

METHOD

An integrative review of the literature, conducted in six distinct stages: 1- subject identification; 2 - establishment of criteria for inclusion and exclusion of studies; 3 - definition of the information to be extracted from the selected studies; 4 - evaluation of the studies included in the integrative review; 5 - interpretation of results; and 6 - presentation of the review.[6]

The subject identification was based on the following guiding question: How important is the use of the CAM-ICU scale for the diagnosis of delirium in ICU patients according to Brazilian and international literature?

The second step consisted of the establishment of criteria for the inclusion and exclusion of studies and the search in the literature carried out through the databases of the International Literature in Health Sciences – MEDLINE, Spanish Bibliographic Index of Health Sciences – IBECS and *Literatura Latinoamericana y del Caribe em Ciencias de La Salud – LILACS*. These databases were chosen due

to their national and international reach, as they are considered references in knowledge production in the health area.

The articles included are from Qualis A and B journals from website of the Coordination for the Improvement of Higher Education Personnel (CAPES) which had nursing and medicine as evaluation area and were available for consultation through the Sucupira Platform (https://sucupira.capes.gov.br), according to the Qualis Periodicals 2013-2016.

The search was performed with articles published between 2010 and 2015, using the terms defined in the Health Sciences Keywords – DeCS (http://decs.bvs.br): (1) - Delirium, (2) - ICU, (3) Diagnosis, and the free term CAM-ICU, as it is an important element to find studies related to the CAM-ICU scale. The keywords were combined using Boolean operator "and", as described in Chart 1.

Chart 1. Keyword combination with databases used in the research.

COMBINATION	MEDLINE		IBECS		LILACS	
	TOTAL	INCLUDED	TOTAL	INCLUDED	TOTAL	INCLUDED
Delirium *and* ICU *and* Diagnosis *and* CAM-ICU	25	9	2	2	1	1
ARTICLES INCLUDED	**12**					

Source: Authors, 2016.

Data collection took place from February to May 2016, applying the following inclusion criteria: articles with full version available online, free of charge, written in Brazilian Portuguese, Spanish and English. The exclusion criteria were: works identified as reviews, news, theses, dissertations, dossiers, editorials, book chapters, and those that do not fit the established time period.

In the third stage the information to be extracted from the selected studies was defined as: article title, author(s), type of study, periodical/database, year, language, country of origin and results, the latter being the key point for discussion and elucidation of the next steps.

In the fourth stage, the studies were evaluated by reading the title and the abstract of the articles in the databases. 28 articles were initially identified, 10 of which were excluded because they were not free and 6 because the full version was not available, so that the final sample consisted of 12 articles, which were read in full for this review.

In the fifth and sixth stages the selected production was organized by means of descriptive tables, associating the data by similarity. The data were then critically analyzed and interpreted as described below in the Results and Discussion section.

RESULTS AND DISCUSSION

Twelve original articles that met the inclusion criteria previously established were reviewed. Most publications occurred in 2011, and no publications were found in the years 2013 and 2015. Of these, 9 were from MEDLINE, 1 from LILACS and 2 from IBECS. Among the articles selected for the sample, 100% report field research experiences, i.e., none of them were review studies. The small number of articles related to the subject indicates that this line of research is still scarcely explored. There were no publications in Brazilian journals in the period selected for this research. Charts 2 and 3 below describe the articles selected for the sample.

Chart 2. Description of the selected articles according to title, authors, type of study, periodical/database and year of publication.

Article title	Author(s)	Type of study	Periodical/Database	Year
1. Metodo para la evaluación de la confusión en la unidad de cuidados intensivos para el diagnóstico de delírium: adaptación cultural y validación de la versión en idioma espanõl	Tobar E, et al.[7]	Field research	Med. Intensiva / IBECS	2010
2. Versión en espanõl del metodo para la evaluación de la confusión en cuidados intensivos, estudio piloto de validación	Toro AC, et al.[8]	Field research	Med. Intensiva / IBECS	2010

3. Translation and validation of the Korean confusion assessment method for the intensive care unit	Heo EY, et al.[9]	Field research	*BMC Psychiatry* / MEDLINE	2011
4. The validity and reliability of the Portuguese versions of three tools used to diagnose delirium in critically ill patients	Gusmao-Flores D, et al.[10]	Field research	CLINICS / LILACS	2011
5. Routine Use of the Confusion Assessment Method for the Intensive Care Unit	Van Eijk MM, et al.[11]	Field research	*Am. J. Respir. Crit Care Med* / MEDLINE	2011
6. Delirium and Sedation Recognition Using Validated Instruments: Reliability of Bedside ICU Nursing Assessments from 2007 to 2010	Vasilevskis EE, et al.[12]	Field research	J. Am Geriatr Soc. / MEDLINE	2011
7. CAM-ICU and ICDSC Agreement in Medical and Surgical ICU Patients Is Influenced by Disease Severity	Fagundes JAO, et al.[13]	Field research	*Plos One* / MEDLINE	2012
8. Comparison and Agreement Between the Richmond Agitation-Sedation Scale and the Riker Sedation-Agitation Scale in Evaluating Patients' Eligibility for Delirium Assessment in the ICU	Khan BA, et al.[14]	Field research	CHEST / MEDLINE	2012
9. Comparison of CAM-ICU and ICDSC for the detection of delirium in critically ill patients focusing on relevant clinical outcomes	Tomasi CD, et al.[15]	Field research	*Journal of Critical Care* / MEDLINE	2012
10. Validity and reliability of the Thai version of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU).	Pipanmekaporn T, et al.[16]	Field research	*Clinical Interventions in Aging* / MEDLINE	2014
12. Decreasing Inappropriate Unable-to-assess Ratings for the Confusion Assessment Method for the Intensive Care Unit	Swan JT.[17]	Field research	*American Journal of Critical Care* / MEDLINE	2014
11. Validation of the Confusion Assessment Method for the Intensive Care Unit in Older Emergency Department Patients	Han JH, et al.[18]	Field research	*Society for Academic Emergency Medicine* / MEDLINE	2014

Source: Authors, 2016.

Chart 3. Description of the selected articles according to title, language, county of origin and results.

Article title	Language	Country of origin	Results
1. Metodo para la evaluación de la confusión en la unidad de cuidados intensivos para el diagnóstico de delírium: adaptación cultural y validación de la versión en idioma espanõl	Spanish	Chile	The CAM-ICU version in Spanish is a valid, reliable and reproductive instrument that may be successfully used for the diagnosis of Delirium.
2. 2.Versión en espanõl del metodo para la evaluación de la confusión en cuidados intensivos, estudio piloto de validación	Spanish	Colombia	The study presented good agreement between sensitivity and specificity and also predictive values for use in adult patients admitted to ICUs.
3. Translation and validation of the Korean confusion assessment method for the intensive care unit	English	Korea	The method used in Korean version proved to be valid and proper to be incorporated in the ICUs practice. The scale assists in the diagnosis of delirium in patients at ICUs.
4. The validity and reliability of	English	Brazil	CAM-ICU and the *Intensive Care Delirium*

the Portuguese versions of three tools used to diagnose delirium in critically ill patients			*Screening Checklist* (ICDSC) are valid instruments that may be used in Brazilian Health Institutions with a high degree of precision. The CAM-ICU can be used as a practical, fast and reliable tool.
5. Routine Use of the Confusion Assessment Method for the Intensive Care Unit	English	Netherlands	At this study, the sensitivity of the CAM-ICU scale was low, while the specificity was high.
6. Delirium and Sedation Recognition Using Validated Instruments: Reliability of Bedside ICU Nursing Assessments from 2007 to 2010	English	United States of America	This study demonstrates that the delirium and sedation measurements can be performed in a reliable way, having the monitoring with validated instruments being carried out integrally.
7. CAM-ICU and ICDSC Agreement in Medical and Surgical ICU Patients Is Influenced by Disease Severity	English	Brazil	The scale may vary according to the group of ICU patients and also considering the severity of the disease.
8. Comparison and Agreement Between the Richmond Agitation-Sedation Scale and the Riker Sedation-Agitation Scale in Evaluating Patients' Eligibility for Delirium Assessment in the ICU	English	United States of America	In the delirium triage, RASS and SAS tools may be used to evaluate the level of consciousness, making effective the use of CAM-ICU scale.
9. Comparison of CAM-ICU and ICDSC for the detection of delirium in critically ill patients focusing on relevant clinical outcomes	English	Brazil	This study identifies that the CAM-ICU scale is more effective for the delirium diagnosis when compared to ICDSC.
10. Validity and reliability of the Thai version of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU).	English	Thailand	It demonstrates that the Thai version of CAM-ICU has a high validity and reliability, in addition to taking less time to be completed in relation to psychiatric evaluations performed.
11. Decreasing Inappropriate Unable-to-assess Ratings for the Confusion Assessment Method for the Intensive Care Unit	English	United States of America	It allowed to improve the nurses´ ability to precisely identify delirium using CAM-ICU scale. 96% of the nurses participating in this research were able to identify it.
12. Validation of the Confusion Assessment Method for the Intensive Care Unit in Older Emergency Department Patients	English	United States of America	CAM-ICU applied by nurses was positive in 35 of the 75 participants. The study presented modest sensitivity (in the elderly) and excellent specificity.

Source: Authors, 2016.

Validation and Reliability

In Tanaka et al[5] study, which aimed at conducting a multinational survey with professionals from intensive care units to determine the practices related to the evaluation and management of delirium, it was observed that CAM-ICU was the most frequently mentioned (66,9%) validated diagnostic tool among the research participants.

The scale use has proved to be effective, since 11 articles[7-17](91,6%) endorse CAM-ICU as a fast, reliable and efficient method to diagnose delirium, being considered a good instrument for use in the daily practice. On the other hand, only 01 article[18] (8,3%) reports that the

identified low sensitivity of CAM-ICU makes it difficult to early detect delirium.

It could be verified that, in the Vasilevskis et al[12] study, evaluations conducted using validated delirium and sedation measurement tools in ICUs are sustainable and reliable for the use in clinical practice. This is also corroborated by Pipanmekaporn et al[16,] who affirms that the scale requires less time to be applied than the complete psychiatric evaluations, besides being easily used for delirium diagnosis and being a high validity and reliability tool for use in therapy units.

In contrast, Van Eijket al[11], report that their study presented high specificity and low sensitivity, making it difficult to diagnose delirium in the daily practice of ICUs. They justify the cause of this low sensitivity to be related to the inadequate formation or application of the scale, given that the study is a multi-centric one.

Translation and comparison of the scale

The CAM-ICU scale is originally in English Language and translations are provided for use in other languages. Considering the articles studied, 04[7,8,9,16](33,3%) deal with the translation of this scale to other languages, such as: Spanish, Korean, Portuguese and Thai. The scale was validated and used in all languages as an instrument to identify

delirium. Out of these, the Thai version[16] had the highest sensitivity (92,3%) and the Spanish version[8] (98,8%) had the highest specificity when compared to the other versions.

The CAM-ICU and ICDSC scales were compared in 03 articles[13-15](25%), and it was found that CAM-ICU is reported as the best predictor of results for the diagnosis of delirium, given its high sensitivity, its fast application and because it does not exclusively depend on the verbal response of the examinee. When it comes to ICDSC, this is a more subjective tool, suggesting that its greater positivity is associated to the low specificity of the diagnosis.

According to Tomasi et al[15], the CAM-ICU scale is a fast application tool (2-5 min.) and its strength is not to be dependent on the patient´s verbal response - thus, it can be used in patients under mechanical ventilation. In contrast, ICDSC is a checklist that can be implemented for 24 hours, it is easy to apply and has high sensitivity - but scarce specificity.

Patient Assessment

Vasilevskis et al[12], Fagundes et al[13] and Swan et al[17] report the delirium triage being conducted by a nurse, with assessment every 12 hours, after the patient has remained in the ICU for at least 24h. Van Eijk et al[11] study also reports the

delirium triage being performed by daily practice nurses. Thereafter, three experts performed assessments to classify patients, one of the three was a medical researcher or a nurse scientist and the other two examiners were psychiatrists, geriatricians or neurologists, as to ensure a multidisciplinary team. Re-evaluation of the patient condition took place after 48 hours.

On the other hand, Gusmão-Flores et al[10], report the evaluation to take place 48 hours after the patient remains at the ICU, with two trials being carried out every week, according to the availability of the involved neurologists and psychiatrists. In the studied articles, the average age of ICUs patients diagnosed with Delirium ranged from 58 to 64 years old.

The role of Nursing in the use of CAM-ICU scale and its application at ICUs

The Nursing team has great importance and greater time of dedication to the daily neurological assessment of ICU patients. The evidence indicates that delirium conditions mortality and morbidity in hospitalized patients who present modifiable risk factors for this disease. In order to provide a qualified assistance, it is necessary to have a multi-professional team trained and skilled regarding the protocols and scaled adopted by the ICU service.[2,19]

CONCLUSION

The CAM-ICU scale in intensive care units is reliable and easy to apply in daily practice for the diagnosis of delirium. Its translations into other languages did not compromise its use and, when compared, were equally effective in the diagnosis. The studies´ results show that just a few delirium cases are not identified, even when the scale is systematically used. In order to achieve that, it is necessary to train a multi-professional team and continuously evaluate the use of such instrument.

The role of the nurse is of great importance in the early identification of delirium due to the higher amount of hours dedicated to the care of the ICU patient. Therefore, it is suggested that CAM-ICU scale is used and disseminated as an assistance tool to monitor patients, favoring reductions in costs and in the hospitalization time.

As a limitation, we verified that there are a few Brazilian studies on this area, which may suggest that such a method is not yet used in the Brazilian Intensive Care routines or that this subject is little approached in the national literature. Therefore, it is suggested that new studies be conducted in order to implant and disseminate the use of CAM-ICU in Brazil through multidisciplinary

teams with potential protagonism for the nurse.

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