

THE ASSESMENT OF COGNITIVE IMPAIRMENT FOR STROKE PATIENT

Anja H. Kholis, Anis S. Syarifah

Jombang District, High School of Health Science

Email: hesniaanja@gmail.com

ABSTRACT

Introduction: Stroke is a leading cause of long-term disability. Deficit neurological of stroke have impact in physical, emotional, social, and cognitive aspects. The impact of deficit neurological may affects long-term quality of life. The purpose of this study was to evaluate the effectiveness of cognitive impairment assessment for stroke. **Method:** Using an electronic database including Pubmed, Sciencedirect, Medline Ebsco Host, Proquest and Springerlink Library only for English language articles. Combining cognitive impairment, screening cognitive, screening MoCA, MoCA tools, screening MMSE, MMSE tools, and stroke as the search keywords. The 603 articles retrieved. Using matching keywords, 40 articles were selected. Finally, 4 articles were selected which are study of test accuracy among consecutive patients. **Result:** Using MoCA test more effective to evaluate cognitive impairment for stroke patients. **Discussion:** The MoCA test for patient post stroke can detect cognitive impairment compared using the MMSE. The MMSE subtest domain score can't distinguished, while the MoCA subtest domain score (visuospatial/executive function, attention and recall) can be distinguished. Assessing executive function can help determine a patient's capacity to execute health care and discharge planning decisions.

Keywords: MoCA, MMSE, stroke

INTRODUCTION

Cognitive impairment is one of the morbidities after stroke which was reported incidence 10 %. Cognitive impairment occurs in 45% of patients in the acute phase. Cognitive impairment is common in stroke such as impaired attention, memory, orientation, language, executive functions, apraxia and agnosia (National Stroke Foundation, 2010). Patients with cognitive impairment will greatly affect in activity daily living. The perceived difficulties in cognitive abilities daily living, such as memory, attention, decision-making, cognitive function and executive (the perceived difficulties in the application of mental functions related to planning, organizing, calculating, work with memory and learning). Communication difficulties are perceived related with verbal expression, the production of language, articulation, understanding and organization. Information about the patient's condition related to cognitive

function of the patients should be conveyed to the family because it can cause stress on the family (Gershon et al., 2012).

Cognitive impairment can be determined by assessing the time of treatment in the acute phase, so patients and families can understand about disability that occurs. Assessment that most often used to determine cognitive function is MMSE (Mini-Mental State Examination). MMSE is composed of six domains to assess the orientation, registration, attention, recall, language, and imitate the picture. Another assessment that can be used is the MoCA (Montreal Cognitive Assessment). MoCA test consists of 9 domains which determine the function of visuospatial/executive, CDT (clock drawing test), naming, memory, attention, language, abstraction, delayed recall, and orientation. ROC (*Receiver Operating Characteristic*) for MoCA with AUC (*Area Under the Curve*) is 0,882 and the corresponding results for the 2 MMSE showed similar AUC 0.839. In this study

also mentioned that both MoCA and MMSE have a reliable vote for the diagnosis of cognitive impairment after a stroke (Shen, et al., 2016).

MMSE failed to detect any decline in cognitive domain (Schweizer et al., 2012). MMSE is widely applied in the clinic, but it is inadequate for evaluating mild cognitive impairment due to sensitivity on visuospatial and executive function deficits. Otherwise, MoCA can detect mild cognitive impairment and more sensitive for detecting cognitive impairment compared to MMSE (Oh, Kim, Shim & Seo, 2015). Nursing research about the importance of cognitive status assessment in stroke patients is very rare. 55% of nurses did not identify patients' cognitive impairment in the general ward. Researchers identified 36% out of 182 patients who were treated in the medical/surgical had cognitive impairment. Nurses can only detect cognitive impairment by 28%. It can be concluded that the nurses unable to identify impaired cognitive function of the patients due to the lack of knowledge about the assessment of cognitive function (Souder & Osullivan, 2000). The challenges to obtain an accurate assessment of cognitive function for nurses in all adult patients are to assess disability and then looking for reliability, validity, and convenient use (Pangman, Sloan, & Guse, 2000). So, the assessment to find problems in a more specific cognitive function in stroke patients is necessary.

METHOD

Search strategy that use in this article was an electronic database including

Pubmed, Sciencedirect, Medline Ebsco Host, Proquest and Springerlink Library only for English language articles. Combining cognitive impairment, screening cognitive, screening MoCA, MoCA tools, screening MMSE, MMSE tools, and stroke as the search keywords shown at table 1. The 603 articles retrieved. Using matching keywords, 40 articles were selected. Finally, 4 articles were selected which are study of test accuracy among consecutive patients. Table 1. PICO Strategy

Keyword

P Cognitive impairment or screening cognitive
I Screening MoCA or MoCA tools
C Screening MMSE or MMSE tools
O Stroke

RESULT

The articles had 1.b level evidence for diagnosis test – study of test accuracy among consecutive patients is the second highest level (Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party, 2013). The articles were using consecutive sampling, have gold standard and index test. AUC has classified based on tools prediction: 0.9 – 1 : perfect ; 0.8 – 0.9 : good ; 0.7 – 0.8 : enough; 0.6 – 0.7 : less ; 0.5 – 0.6. The AUC of MoCA were 0.92; 0.85; 0.91; 0.902; it was means that screening can predict risk of cognitive impairment respondents were perfectly approaches 100%.

Table 2. Synthetizing the evidence

Outcomes	(Yanhong Dong et al., 2010)	(Y. Dong et al., 2012)	(Larner, 2012)	(Salvadori et al., 2013)
Cut of point	MMSE : -- 23/24 -- 78.7 % correctly classified - MoCA : -- 19/20 -- 85.1 % correctly classified	MMSE : - 25/26 - 72 % correctly classified MoCA : - 21/22 - 70 % correctly classified	MMSE : - ≥26/30 MoCA : - ≥26/30	MoCA cut-off 21

Sensitivity	MMSE : - 0.72 MoCA : - 0.83	MMSE : - 0.88 MoCA : - 0.88	MMSE : - 0.65 MoCA : - 0.97	MoCA 91,4%
Specificity	MMSE : - 0.83 MoCA : - 0.86	MMSE : - 0.67 MoCA : - 0.64	MMSE : - 0.89 MoCA : - 0.60	MoCA 75,8%
Positive Predictive Value	MMSE : - 0.72 MoCA : - 0.79	MMSE : - 0.47 MoCA : - 0.45	MMSE : - 0.82 MoCA : - 0.65	MoCA 80%
Negative Predictive Value	MMSE : - 0.83 MoCA : - 0.89	MMSE : - 0.94 MoCA : - 0.94	MMSE : - 0.78 MoCA : - 0.96	MoCA 89,3%
ROC AUC	MMSE : - 0.84 (95 % CI 0.75-0.92) MoCA : - 0.92 (95 % CI 0.86-0.98) <i>p</i> = 0.02	MMSE : - 0.83 (95 % CI 0.77-0.89) MoCA : - 0.85 (95 % CI 0.79-0.90)	MMSE : - 0.83 (95 % CI 0.77-0.90) MoCA : - 0.91 (95 % CI 0.86-0.95) <i>Area under ROC:</i> - MMSE 0.83 (0.77-0.90) - MoCA 0.91 (0.86-0.95)	MoCA AUC 0.902 <i>p</i> = 0.001

Out of four studies, two of them, setting for the application and inclusion criteria can be combined as a reference in the application screening of MoCA. However, all studies agree that cognitive function screening MoCA is more specific to assess impaired cognitive function in stroke patients.

DISCUSSION

Based on this study, it can be seen that MoCA is more specific and sensitive to detect cognitive impairment. The MoCA test for patient post stroke can detect cognitive impairment compared using the MMSE. The MMSE subtest domain score can't be 4 distinguished, while the MoCA subtest domain score (visuospatial/executive function, attention and recall) can be distinguished. Few practitioners are familiar with testing for executive function, there were brief valid and reliable instruments yet. The instruments listed below have good internal consistency, interrater reliability and were strongly correlated with the Folstein Mini-

Mental Status Exam (MMSE) and with lengthier neuropsychological assessments of executive function: Royall's CLOX (clock drawing), Controlled Oral Word Association Test, and Trail Making Test, oral version (Kennedy & Einstein, 2012).

The evaluation of cognitive screening at the bedside can be performed between fifth and ninth day after stroke (Salvadori et al., 2013). Assessing executive function can help determine a patient's capacity to execute health care decisions and discharge planning decisions (Kennedy & Einstein, 2012).

Nurses have a role in recognizing impaired cognitive function of stroke patients using a sensitive and specific instrument. MoCA through the application of evidence-based nursing to screening cognitive function have complete domain. Nurses have the longer interacting with patients and their families, so they can recognize changes and cognitive impairment earlier. Through the enforcement of nursing diagnosis related to cognitive function domain, the nurse can

provide appropriate interventions for patients and their families.

Age, gender, education level affects the person's cognitive function. The prevalence of cognitive impairment was statistically 34% associated with gender (female). Some studies suggest that the higher life expectancy for women result the higher number of cognitive impairment. In 2010, life expectancy for men is 69.7 years old, while the female age was 77.3 years (Winter Holz, Nunes, Thume, Lange, & Facchini, 2013).

Clinical factors and cognitive disorders are closely related. Medical conditions, severity of stroke, neuroimaging characteristics, the history of vascular disease factors such as heart disease, hypertension, diabetes, and atrial fibrillation can affect cognitive function. Neurological deficits that occur will affect Barthel index score. Barthel index is a significant predictor to cognitive impairment 3 months after stroke (Faizal et al., 2016).

CONCLUSION AND RECOMENDATION

This study also has several limitations, nurse articles which discuss about assessment of cognitive function is very rare. Not all articles can be applied because of setting the application and inclusion criteria in the application screening MoCA. Journals are selected not a systematic review, so had possibility of limitations in the synthesis of the results. Indonesia still develop nursing practice about necessary of the assessment in each hospital. Policy differences of cognitive impairment assessment.

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