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Reinforcing the cultural biases in application of montreal cognitive assessment in determination of mild cognitive impairment

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Abstract

Mild cognitive impairment is the stage between dementia-a severe cognitive decline and the normal aging-related loss of memory and thinking. Cognitive impairment can also result from delirium, substance use, sleep disturbances, psychiatric illness, and metabolic conditions. Hence, assessing the cognitive function of older adults with psychiatric presentations is necessary. Assessment tools like the Montreal Cognitive Assessment (MoCA) and Mini–Mental State Examination scales have been helpful as quick screening tools. Evidence in the literature has suggested that the application of MoCA is being limited by cultural biases as its application in other cultures results in discordance scores. However, there remains a paucity of literature to support this cultural bias. Hence, we present a case of a patient with a low score of the MoCA but exhibits high cognition function, who grew up in a time and locale where animal components of the MoCA scale were rarely seen in real-time or media.

Keywords: Assessment; Bias; Cognitive; Cultural; Impairment; Montreal.

Introduction

Mild Cognitive Impairment (MCI) has been described as a pre-dementia stage of aging adults, sometimes classified as a transitional stage into dementia. Mild cognitive impairment is a recognized feature of Alzheimer's Disease (AD), hence the need to screen susceptible individuals [1]. MCI, though most of the time independent of care, can display a variety of neuropsychiatric symptoms such as agitation, aggression, sleep disturbances, and disinhibition that can bring them in contact with a psychiatrist [2]. Such neuropsychiatric symptoms are due to the early deposition of amyloid plaques in the prefrontal cortex structures. The annual conversion rate of MCI to AD is estimated to be 10 to 15%. AD is the commonest cause of dementia and the transitional markers from MCI to dementia are quite difficult to define [3]. Cognitive impairment can also result from other neurocognitive disorder, delirium, substance use, sleep disturbances, psychiatric illness, and metabolic conditions [3]. Some factors have been found to preserve cognitive functions in aging patients [4]. These factors include high premorbid intellectual function and high-quality occupational and educational attainment. Given limited availability of biomarkers for neurodegeneration, diagnosis is reliant on clinical judgment, defined by clinical, cognitive, and functional criteria [5].

The Montreal Cognitive Assessment (MoCA) is used in aging populations to screen for MCI and dementia based on cognitive and functional criteria. Ziad Nasreddine created it in Montreal,

Quebec, in 1996 [6]. It has been accepted in several therapeutic settings and validated in the context of MCI [7]. MoCA scores range between 0 and 30. It evaluates seven cognitive domains on a single page and these domains are: visuospatial/executive functions, naming, verbal memory registration and learning, attention, abstraction, 5-minute delayed verbal memory, and orientation [7]. A score of 26 or over is considered to be normal [6].

The Mini–Mental State Examination (MMSE) is another tool that is in common usage. Its development in 1975 heralded, a global assessment of cognitive status in suspected MCI patients. The MMSE contains 21 different items in 11 different tests, with scores ranging from 0 to a perfect score of 30, scores of 23 or less are typically seen as reflecting dementia and meriting a more detailed assessment [8]. The MoCA can discriminate MCI from normal cognition but concerns are being raised about the utility of the MoCA in minority populations and other parts of the world [8]. Examining rates of cognitive impairment and related risk factors in various populations reveals disparities in MCI incidence and the measurement bias [9].

The validity of the cognitive tests used to determine MCI may be impacted by shared information, experience, views, values, attitudes, and reflective behavior due to test- or tool-administration-related biases. The disparities in daily routines and lifestyles caused by cultural variations in access to resources such as work, food, recreation, and education might affect the validity of MoCA [10]. We present a patient with a low MoCA score that he has not heard of rhinoceros, and has rarely seen a donkey or a lion throughout his childhood to adulthood but with high score in MMSE [10].

Case report

The patient is a 59-year-old man with a history of schizophrenia and a past medical history of hypertension. The patient was brought into the psychiatric emergency room by emergency services activated by the family for psychiatric evaluation on account of the patient getting progressively agitated and noncompliance with medications. On evaluation, the patient was loud with pressured speeches. He reports that he is in the army, works for the Federal Bureau of Investigation, for Biden and he is a doctor. His thought process was disorganized, illogical, tangential with flight of ideas, and loosening of associations. His thought content was significant for grandiose, persecutory, and paranoid, delusions. The patient appears internally preoccupied, responding to internal stimuli. The patient lacked insight into his mental illness. His judgment over the treatment was limited. He reported no substance use nor drinks alcohol. His blood pressure was 142/78 mmHg, other vital signs and physical examination on admission were unremarkable. The laboratory investigations including complete blood count, complete metabolic panel, urinalysis, and urine drug screening were within the reference limit. Chest X-ray was unremarkable but electrocardiogram showed mild left ventricular enlargement with normal QT/QTc.

Hospital course: The patient was started on risperidone 1 mg po bid for psychosis, valproic acid 500 mg po bid for mood stabilization, and escitalopram 10 mg po HS for depression. In the initial few days of admission, the patient was more irritable and continued to display frequent episodes of aggressive behavior in the unit. The risperidone was titrated to 2 mg po bid and valproic acid was titrated to 500 mg po tid. After another week of treatment, the patient continued to exhibit persistent agitation, the risperidone 2 mg po bid was titrated down and the patient started on olanzapine 10 mg po HS. After a few days, Risperidone was gradually stopped and olanzapine was titrated to 15 mg po HS. The persistent agitation gradually improved significantly after a few days. His blood pressure was controlled with amlodipine 10 mg PO daily. The patient started attending group therapy sessions and continued to be adherent to medications.He reported no medication side effects. After 3 months of admission, the patient continued to exhibit delusion which was interfering with his interaction with staff to provide care to the patient. Decisions were made by the team to evaluate the patient for mild cognition impairment using MoCA and the MoCA score came out 20. The concern for adding a diagnosis of MCI necessitated further assessment with MMSE. The patient had an MMSE assessment and the score was 27. Independent multiple assessments in the unit do not reveal short-term or long-term memory deficits. The patient was further evaluated on his developmental milestones, the patient revealed that he grew up on a Caribbean Island, when social media was not popular and has not heard of rhinoceros. He further stated, that he did not see a donkey or lion while growing up or even in his adulthood. These animals are components of the MoCA scale. The patient eventually received Abilify 30 mg po, then intramuscular Aristada 675 mg. He reported no side effects and received intramuscular Aristada 1064 mg on the next day. He was scheduled for the next dose in 2 months. The patient subsequently showed marked improvement as evidenced by independent activities of daily living, an exhibition of adequate insight into his mental illness, and good judgment about the treatment plan. The patient displayed the ability to plan for travel, acknowledged his capability for instrumental activities for daily living and then, discharged.

Discussion

The cognitive screening tests have been demonstrated to perform differently depending on the culture. Cultural variations potentially affect the validity of MoCA [11]. For example, an item in MoCA which a patient is told to copy might be ambiguous because of lack of a prior encounter [12]. Occasionally, there is a lack of the necessary knowledge in a cultural setting to understand MoCA. The background culture where the patient in the index report grew up must have definitely impacted on his score on MoCA. The patient endorsed not being familiar with the animals in the MoCA scale because he did not see them while growing up.

The use of MoCA for objective evaluation of cognitive functions in clinical settings is being advocated by the Alzheimer Society. For older adults, MoCA is a quick and practical screening test that has a high sensitivity and specificity for identifying MCI [13]. With performance-based questions designed to sample from a wider range of cognitive areas [6], the MoCA screening exam appears to be more sensitive to cognitive impairment than the MMSE [13,14] but there are reports of cultural influence on the interpretation of MoCA scores [10]. Advocating for the screening of dementia in the older adult psychiatry remains a contentious issue as debate continues to trail the subject

[15]. In evaluation MoCA's strengths and limitations as a tool for measuring cognitive functioning, results show that there is no strong correlation between individual MoCA tests and the presumed cognitive domains, reflecting, at least in part, the existing lack of agreement over the definition of fundamental cognitive constructs and the subcomponents that fall under the purview of many cognitive domains. The researchers recommended that MoCA should not be viewed as a substitute for more in-depth neuropsychological assessment when domain-specific information is required [15]. The assessment of the patient in the index report revealed a low MoCA score but more in-depth neuropsychological assessments did not reveal cognitive impairment. The patient's MMSE score was high. However, the patient's revelation of growing up on an Island where he did not see nor heard of some animals in the MoCA adds to the cultural influences in the interpretation of MoCA scores. The prevalence of social media as seen nowadays was lacking in the 50s when the patient grew up. The pictures of a rhinoceros, camel, and lion not being easily recognizable in some nations add to the limitations of MoCA [16].

Conclusion

The experience drawn from the index patient serves as a call in reinforcing the cultural biases in the application of MoCA for screening for MCI. The screening test by MoCA should be an initial step in evaluating cognitive function, especially in older adults. A thorough clinical assessment with possible use of additional screening test ensures inappropriate diagnosis of MCI on someone whose cognitive function is intact.

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References

1. Levey A, Lah J, Goldstein F, Steenland K, Bliwise D. Mild cognitive impairment: An opportunity to identify patients at high risk for progression to Alzheimer's disease. Clin Ther. 2006; 28: 991-1001.

2. Manly JJ, Tang MX, Schupf N, Stern Y, Vonsattel JP, Mayeux R. Frequency and course of mild cognitive impairment in a multiethnic community. Annals of Neurology. 2008; 63: 494-506. doi:10.1002/ana.21326.

3. Tábuas-Pereira M, Baldeiras I, Duro D, Santiago B, Ribeiro MH, Leitão MJ, et al. Prognosis of Early-Onset vs. Late-Onset Mild Cognitive Impairment: Comparison of Conversion Rates and Its Predictors. 2016; 1: 11. 10.3390/geriatrics1020011.

4. Tarawneh R, Holtzman DM. The clinical problem of symptomatic Alzheimer disease and mild cognitive impairment. Cold Spring Harb Perspect Med. 2012; 2(5): 006148. doi: 10.1101/cshperspect.a006148. PMID: 22553492; PMCID: PMC3331682.

5. Saleem M, Herrmann N, Swardfager W, Eisen R, Lanctotˆ K.L Inflammatory markers in mild cognitive impairment: A meta-analysis. J Alzheimers Dis. 2015; 47: 669-679.

6. Dautzenberg G, Lijmer J, Beekman A. Diagnostic accuracy of the Montreal Cognitive Assessment (MoCA) for cognitive screening in old age psychiatry: Determining cutoff scores in clinical practice. Avoiding spectrum bias caused by healthy controls. Int J Geriatr Psychiatry. 2020; 35(3): 261-269. doi: 10.1002/gps.5227. Epub 2019 Dec 27.

7. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H. "The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment". J Am Geriatr Soc. 2005; 53(4): 695-9.

8. Gluhm S, Goldstein J, Loc K, Colt A, Liew CV, Corey-Bloom J. Cognitive performance on the mini-mental state examination and the montreal cognitive assessment across the healthy adult lifespan. Cogn Behav Neurol. 2013; 26(1): 1-5.

9. Milani SA, Marsiske M, Striley CW. Discriminative Ability of Montreal Cognitive Assessment Subtests and Items in Racial and Ethnic Minority Groups. Alzheimer Dis Assoc Disord. 2019; 33(3): 226-232. doi: 10.1097/WAD.0000000000000310. PMID: 31058685; PMCID: PMC6710139. Sink KM, Craft S, Smith SC, Maldjian JA, Bowden, DW, Xu J, et al. Montreal Cognitive Assessment and modified Mini–Mental State Examination in African Americans. Journal of Aging Research. 2015; 872018. doi:10.1155/2015/872018.

10. O'Driscoll C, Shaikh M. Cross-Cultural Applicability of the Montreal Cognitive Assessment (MoCA): A Systematic Review. J Alzheimers Dis. 2017; 58(3): 789-801.

11. Tanveer S, Croucher MJ, Porter R. Cultural modification of neuropsychiatric assessment: complexities to consider. BJPsych Open. 2022; 8(2): 68. doi: 10.1192/bjo.2022.33. PMID: 35287781; PMCID: PMC8935941.

12. van de Vijver F, Tanzer NK Bias and equivalence in cross-cultural assessment: an overview. Rev. Eur. Psychol. Appliquée/European Rev. Appl. Psychol. 2004; 54: 119-135.

13. Ballard CK, Alistar BNE, Corbett AK, Livingston GU, Rasmussen JR. Helping you to assess cognition: a practical toolkit for clinicians. Alzheimer's Soc Dep Heal. 2015; 1-42. Accessed on 01/06/2024 from https://www.alzheimers.org.uk/.

14. Athilingam P, King KB, Burgin SW, Ackerman M, Cushman lA, Chen l. Montreal Cognitive Assessment and Mini-Mental Status Examination compared as cognitive screening tools in heart failure. Heart Lung. 2011; 40(6): 521-9.

15. Coen RF, Robertson DA, Kenny RA, King-Kallimanis BL. Strengths and Limitations of the MoCA for Assessing Cognitive Functioning: Findings From a Large Representative Sample of Irish Older Adults. J Geriatr Psychiatry Neurol. 2016; 29(1): 18-24. doi: 10.1177/0891988715598236. Epub 2015 Aug 6. PMID: 26251108.

16. Press, Andrea. "Gender and Family in Television's Golden Age and Beyond." Annals of the American Academy of Political and SocialScience. 2009; 625.