IMPROVING THE DIAGNOSIS OF COGNITIVE IMPAIRMENT IN MONTENEGRO – ON THE PATH OF LEARNING

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Abstract

The estimated prevalence of dementia in Montenegro was lower compared to most of the European countries in 2019 (1.06%). There is a concern that with currently used diagnostic approach, dementia in Montenegro is underdiagnosed.

To assess currently used neuropsychologic screening tests, 15 patients with clinical signs of cognitive impairment (CI) were recruited at the Clinical Center of Montenegro in 2019. Following the clinical assessment, patients were divided in 2 groups: mild cognitive impairment (MCI) and dementia. They were subsequently subjected to Mini-Mental State Examination (MMSE), routinely used in primary health care; and to Montreal Cognitive Assessment (MoCA), designed for improved detection of MCI.

The average time from the first disease manifestation until the diagnosis was 13.4 months. The higher the level of education was, the longer was the time to diagnosis ($r=0.545$, $p<0.05$). Nevertheless, more patients with longer education were among those with MCI ($p<0.05$), without significant difference in age between the groups. The MMSE and MoCA results showed strong correlation ($r=0.974$;$p<0.01$). However, while the MoCA scores aligned with clinical assessment, MMSE identified 46.7% patients as normocognitive.

Better cognitive reserve in more educated people might explain delayed onset of CI. However, it does not explain longer time to diagnosis, since once diagnosed with CI, patients with better cognitive reserve have faster cognitive decline. Thus, stigma associated with CI might be the cause. Our results suggest that elimination of negative behavioral model in patients and use of adequate screening tools by physicians could greatly improve timely diagnosis of CI in Montenegro.

Introduction

The estimated prevalence of dementia in Montenegro was 1.06% in 2019, which is lower compared to most of the European countries (1). There is a serious concern that with the currently used diagnostic approach, dementia in Montenegro is underdiagnosed, and that the number of people with dementia requiring care might be much higher.

Is cognitive impairment a sufficiently recognized problem in Montenegro ?

Methods and Materials

In the prospective study conducted in 2019., patients with clinical signs of cognitive impairment were recruited at the Clinical Center of Montenegro. To assess currently used neuropsychologic screening tests, they were subjected to the Mini-Mental State Examination (MMSE), routinely used in primary health care, and to the Montreal Cognitive Assessment (MoCA), designed for improved detection of MCI. Further clinical evaluation followed for the 15 patients scored with <24 in any of the tests, which is accepted cutoff score for cognitive impairment (2). In order to set definite diagnosis and evaluate potentially excluding criteria, patients filled out a questionnaire, neurological examination was conducted, so as laboratory and radiological assessment. Finally, using Petersen criteria for MCI (3) and American Academy of Neurology's Dementia Guidelines (4), patients were divided in two groups: MCI and dementia. The excluding criteria were: alchohol or drug consumption, other neurological and psychiatric diseases.

The data was processed using the following statistical tests of the statistical program R : Chi-square test of homogeneity, Fisher's exact test, Wilcoxon rank sum test and Pearson's correlation test.

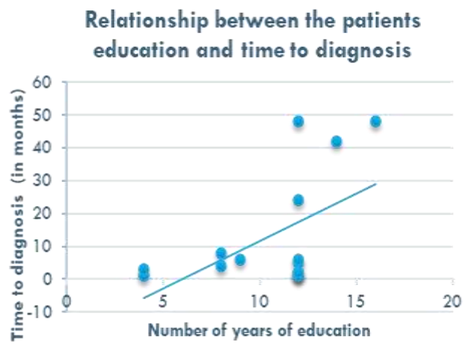
Characteristic	Mild cognitive impairment	Dementia
Age SD		
41-51	0	6.66%
51-61	0	6.66%
61-71	26.66%	6.66%
71-81	20%	26.66%
81-91	0	6.66%
Sex		
Men	26.7%	20%
Women	20%	33.33%
Education SD		
≤8 years of education	0	26.7%
8-12 years of education	40%	13.33%
12-16 years of education	6.7%	13.33%
Hypertension	33.33%	33.33%
Hyperlipidemia	20%	13.33%
Diabetes mellitus	26.7%	20%
Previous cerebrovascular disease	0	0
Smoking		
Current smoking	0	6.7%
History of smoking	13.33%	13.33%
Alcohol consumption		
Current alcohol consumption	0	0
History of alcohol consumption	0	16.7%
Physical activity (≥ 30 min daily)	33.33%	13.33%

Table 1. Patient socio-demographic profile and clinical features

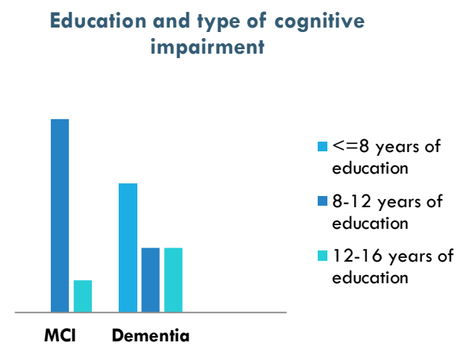
Results

The patients were on average 70 years old, with almost equal sex representation and 10.5 years of education (Table 1). An average time from the first disease manifestation until the diagnosis was 13.4 months and this was in strong correlation with the educational status of patients. Interestingly, the higher the level of the patient's education, the longer it took to diagnose ($r= 0.545$, $p<0.05$), Graph 1.

However, there were more patients with longer education among those with MCI ($p<0.05$), Graph 2, without a significant difference in age between the groups (data not shown).

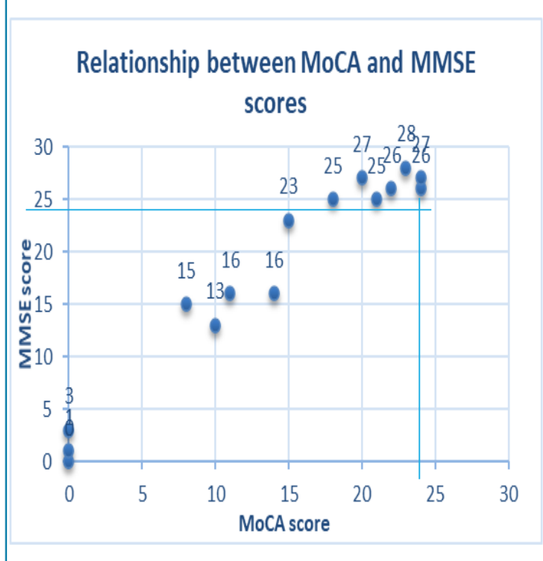


Graph 1.



Graph 2.

The two neuropsychological tests also strongly correlated with one another ($r=0.974$; $p<0.01$) (Graph 3). However, while MoCA scores aligned with the clinical assessment, MMSE identified 46.7 % patients as normocognitive (Table 2).



Graph 3.

Cognitive status	Clinical assessment	MMSE	MoCA
No cognitive impairment	0 %	46,7%	0%
Mild cognitive impairment	46,7%	6,7%	40%
Dementia	53,3%	46,7%	60%

Table 2. Clinical vs. MMSE vs. MoCA results

Discussion

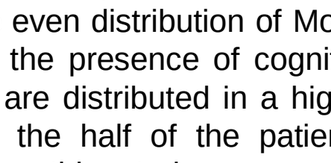
Our results suggest that a better cognitive reserve (CR) in more educated people, delays the onset of cognitive impairment, as other studies have shown (5,6). This means that at the same age, the more educated people are more likely to develop MCI, while those less educated will develop dementia. However, according to the literature, better CR could not explain the longer time to diagnosis, since once diagnosed with CI, these patients sometimes demonstrate a faster cognitive decline (6,7). Therefore, it is probable that more educated people are aware of the potential diagnosis, develop fear from stigmatization and delay medical consultation. The growing body of evidence show, that experience of stigma is significant among people with dementia (8), and that they are stigmatized across a range of layman and professional populations (9).

Although MMSE and MoCA scores strongly correlated with one another, MMSE classified even 46.7 % of patients as normocognitive. If the MoCA test was not conducted, they would not be subjected to further clinical assessment, which confirmed cognitive deficit in all patients. Unlike the even distribution of MoCA scores on the graph 3., which confirms the presence of cognitive deficit in all patients, the MMSE scores are distributed in a higher range, between 24 and 30 for almost the half of the patients, indicating normal cognitive function. So, this study once more confirmed higher sensitivity of the MoCA test for mild cognitive impairment, compared to MMSE, and suggest its use as a preferred test at primary health care level.

Conclusions

Although limited by small sample, study shows that both, patients and health care professionals need educational support. In order to eliminate the negative behavioral model in patients and decrease stigmatic beliefs among the general public, it is necessary to improve patients information and raise awareness about dementia. Also, there is a need for continuous education at the primary health care level and use of adequate screening tools by physicians. According to our study results, these activities could significantly improve the timely diagnosis of cognitive impairment in patients in Montenegro.

Health care professionals and patients are together on the path of learning!



References

1.Alzheimer Europe. Dementia in Europe Yearbook 2019. Estimating the prevalence of dementia in Europe [Internet]. Luxembourg: Alzheimer Europe [cited 2020 Aug 23]. Available from: https://www.alzheimer-europe.org/Publications/Dementia-in-Europe-Yearbooks
2.Trzepacz P, Hochstetler H, Wang B, Saykin A. Relationship between the Montreal Cognitive Assessment and Mini-mental State Examination for assessment of mild cognitive impairment in older adults. BMC Geriatrics. 2015;15:107.
3.Petersen R, Lopez O, Armstrong M, Getchius T, Ganguli M, Gloss D et al. Practice guideline update summary: Mild cognitive impairment. Neurology. 2018;90:126-35.
4.AGS Clinical Practical Commitee. Guidelines abstracted from the American Academy of Neurology's Dementia guidelines for early detection, diagnosis and management of dementia. J Am Geriatr Soc. 2003 Jun;51(6):869-73.
5.Stern Y, Gurland B, Tatemichi TK, Tang MX, Wilder D, Mayeux R. Influence of education and occupation on the incidence of Alzheimer's disease. JAMA. 1994 Apr 6;271(13):1004-10.
6.Soldan A, Pettigrew C, Cai Q, Wang J, Wang MC, Moghekar A et al. Cognitive reserve and long-term change in cognition in aging and preclinical Alzheimer's disease. Neurobiol Aging. 2017 Dec; 60:164-72.
7.Loenhoud AC, Flier WM, Wink AM, Dicks E, Groot C, Twisk J et al. Cognitive reserve and clinical progression in Alzheimer disease, a paradoxal relationship. Neurology. 2019;93:334-46.
8.Lion KM, Szczesniak D, Bulinska K, Evans SB, Evans SC, Saibene FL. Do people with dementia and mild cognitive impairments experience stigma? A cross-cultural investigation between Italy, Poland and UK. Aging Ment Health. 2020;24(6):947-55
9.Blay SL, Peluso ET. Public stigma: the community's tolerance of Alzheimer disease. Am J Geriatr Psychiatry. 2010 Feb;18(2):163-71.