Review paper

EVALUATION OF INSTRUMENTS FOR THE IDENTIFICATION OF COGNITIVE IMPAIRMENTS IN ELDERLY PEOPLE

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Abstract: Dementia in the elderly is an under-recognized condition. Detailed assessment of cognitive status may enable early identification of high-risk patients who are candidates for dementia.Cognitive impairments have a prevalence of 5.1–37.5%.Although cognitive assessment is a cornerstone of geriatric care, there is still no comprehensive and easy-to-interpret instrument, promising potential for a recommended dementia diagnostic system. The aim of this work was to analyze the available studies on the issue of searching for methods of assessing cognitive status and evaluating the instruments used for screening and cognitive assessment in the elderly. The studies were downloaded through the electronic database PubMed, from January 2013 to January 2023. Electronic databases were searched by defining key words (Cognitive impairment and Cognitive assessment and Cognitive screening tools and older people), using the Boolean operators AND and OR.Titles and abstracts were screened, and if the abstract met the inclusion criteria, the text was retrieved in its entirety. Results. A review of the PubMed database and a research strategy identified 56 studies. After reviewing the papers as a whole and according to the clearly defined study inclusion criteria, six papers were included in the final detailed analysis 52 instruments for cognitive assessment were identified.Mini-mental test MMSE, Montreal Cognitive Assessment MoCA, Mini-Cog and 6CIT test were most frequently used. Evidence from the use of numerous validated instruments to assess cognitive status has great potential in identifying the risk of dementia. Future studies require the development and implementation of a new instrument of sufficient reliability with all indicators of cognitive status due to timely identification of dementia, as well as adequate treatment of persons with dementia with accompanying additional diseases.

Key words: age, instruments, cognitive assessment, dementia, elderly people.

Introduction

The number of people over the age of 65 is continuously growing in the world. The most common mental disorders in the elderly are depression and dementia. Cognitive disorders in the elderly are a global problem in the world. Dementia is characterized by progressive intellectual decline, which leads to the inability to fulfill basic social, moral and work obligations in affected persons. Dementia is defined as memory deterioration with possible other associated cognitive deficits: dysphasia, apraxia, agnosia and difficulty in orientation and/or making everyday decisions. Age is the most significant risk factor for dementia, a major problem that is a pandemic

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today. The mentioned deficits are often associated with changes in the sphere of emotional control, social behavior or motivation, and it is considered one of the most prominent causes of disability and dependency of the geriatric population, which is why dementia has become a global public health priority by the World Health Organization [1]. A comprehensive meta-analysis of the population study was presented in 2015 by the World Alzheimer Report, and the report presented that 46.8 million people worldwide live with dementia, and that by 2050 the number of demented persons is expected to reach , out of 131.5 million inhabitants of the planet. It is assumed that this number will triple by 2050 [2, 3, 4]. Cognitive impairments have a prevalence of 5.1–37.5%, and according to the results of large-scale population studies, the prevalence of dementia ranges from 9% - 14% in people over 65 years old, and up to 30% - 35% in people over 85 years [5]. Worldwide, about 40 million people have dementia, and every 3.2 seconds a new case of dementia is identified, which is an additional 10 million new patients per year [6].

Dementia in the elderly is an under-recognized condition. In addition to the fact that certain tests detect cognitive deficit disorders, they also reveal the strengths of the intellect, so the ultimate goal of the test is to discover the upper limit of ability for a particular person at a given time. The use of tests does not reduce the importance of qualitative observation of the patient's behavior. Screening cognitive tests are tools for screening cognitive deficit in situations where the existence of cognitive deficit is suspected. No test has yet been designed to replace the use of a "full battery" of neuropsychological tests to identify cognitive impairment, but they represent a significant aid to clinicians in assessing an individual's cognitive status. Although they do not serve to establish a diagnosis, it is a common point of view that the diagnosis of a cognitive disorder can be established only by using screening tests if the scores obtained on the test are low, but with the support of data obtained through clinical trials. Screening and assessment must be adapted to each patient separately, depending on possible handicaps (motor or sensory deficit, easy tiring, level of education, etc.), while in persons with more pronounced handicaps of various kinds, we cannot even apply screening tests, but only neurobehavioral assessment [7]. Although cognitive assessment is a cornerstone of geriatric care, there is still no comprehensive and easy-to-interpret instrument, promising potential for a recommended dementia diagnostic system. The aim of this systematic References review was to investigate papers that used instruments for cognitive screening and dementia in the elderly in primary and secondary health care.

Methods

A systematic review of the References was done on the basis of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA, statement) [8].

Research strategy. The studies were downloaded through the electronic database PubMed, from January 2013 to January 2023. Electronic databases were searched by defining key words (Cognitive impairment and Cognitive assessment and Cognitive screening tools and older people), using the Boolean operators AND and OR. Titles

and abstracts were screened, and if the abstract met the inclusion criteria, the text was retrieved in its entirety. The criteria for inclusion included all randomized studies, case and control studies, cross-sectional studies, quasi-experimental studies that followed the method of assessing cognitive status and the application of instruments.

Outcome and data extraction. The primary outcome was determining the reliability of timely assessment and early identification of dementia in elderly people. Two researchers (SŽ and JP) independently searched the titles of the abstracts, selecting studies according to the inclusion criteria, and then three researchers (NH, OK and LJK) did the selection and selection of appropriate studies, and then the selected papers with full text.

Results

The strategy of selecting works, ie. 56 studies were identified by reviewing the databases using different combinations of keywords. After reviewing the papers as a whole and according to the clearly defined study inclusion criteria, six papers were included in the final detailed analysis. 52 instruments for cognitive assessment were identified. The most frequently used were Mini-mental test MMSE, Montreal Cognitive Assessment MoCA, Mini-Cog test and 6CIT. Results indicate that each instrument used measures unique but often overlapping sets of cognitive functions, and has its own unique characteristics and reliability of application, and a combination of instruments is often used to provide a complete assessment in a clinical setting. The 6CIT instrument is currently an applicable instrument for use in primary health care for screening and early detection of dementia. According to numerous results, it is evident that the 6CIT is very accurate and acceptable for the assessment of dementia in the elderly, and its sensitivity, specificity and reliability are high compared to MMSE and Mini-Cog, and some authors recommend that the instrument can also be used for secondary assessment level of health care, in hospitalized patients.

Discussion

The analysis and synthesis of the reviewed studies showed that a large number of instruments were used to assess dementia. This work included six studies that dealt with this issue, and the studies point to the fact that in clinical practice, a large number of neuropsychological tests are used today, which can roughly be divided into two groups: tests intended for general testing of cognition - the so-called general diagnostic tests (MMSE, Clock Drawing Test, Addenbrooke's Cognitive Examination - ACE test and its revised form ACE-R) and tests intended for detailed examination of certain domains of cognitive functioning such as: attention, memory, fluency/executive functions, language and visuospatial abilities - the so-called domain-oriented tests (Wechsler Memory Scale - WMS, Total memory or The Free and Cued Selective Reminding Test - Grober - Buschke - FCSRT-GB, Immediate memory Rey Auditory Verbal Learning Task - RAVLT), as well as numerous other tests (9). Mini-mental test (Mini Mental State Examination - MMSE) is the most frequently and widely used screening test, which correlates well with other neuropsychological tests. The accuracy of the test varies in different studies with

different cut-offs, ranging from 13 to 97% for sensitivity, and 60 to 100% for specificity. However, given its variation for sensitivity and specificity, the MMSE is not reliable for identifying mild cognitive impairment (10, 11). MoCA is one of the most widely used tools in clinics, and has been translated into 35 languages. It tests multiple cognitive domains, including short-term memory, visuospatial skills, executive functions, attention, concentration and working memory, language, and orientation. The sensitivity of the tool ranges from 67 to 100%, and the specificity ranges from 50 to 95%. Although it is considered a relatively competent test, it takes a relatively long time ($\geq$ 10 min) to perform and there are evident obstacles regarding the level of education of individuals, which results in limitations of its application, especially in the initial screening of mild cognitive impairment in the elderly in the community [12].

Nevertheless, the 6CIT instrument is currently an applicable instrument for use in primary health care for screening and early detection of dementia. According to numerous results, it is evident that the 6CIT is very accurate and acceptable for the assessment of dementia in the elderly, and its sensitivity, specificity and reliability are high compared to MMSE and Mini-Cog, and some authors recommend that the instrument can also be used for secondary assessment level of health care, in hospitalized patients. It found its great application due to its clarity and easy application in practice. The 6CIT instrument has been translated into many different languages. It consists of six questions, one memory (remember name and address of 5 items), two calculations (reciting numbers backwards from 20 to 1 and months of the year backwards) and three orientations (year, month and time of day). The time required to administer the 6CIT is approximately 2 minutes, which compares favorably with other screening instruments. However, this brevity is also seen as a shortcoming, with the suggestion that more features of dementia may be detected using more comprehensive screening tools. There was also some criticism that the scoring system was too complex. In summary, the 6CIT is a short, validated screening tool that is preferable to the MMSE. Since a "typical" primary health care consultation in many countries of the world, e.g. taking only 7.5 minutes in the UK, the brevity and simplicity of the 6CIT scale are its greatest strengths [13].

Dementia as a syndrome should be diagnosed more often at the primary level of health care, which can have multiple messages: health workers should insist on regular assessment of dementia, be aware of the existence of this problem in family medicine teams, because the number of patients is increasing, and this brings numerous complex problems from the treatment of the patient to actions in families, social communities, and finally in the health and social health care system. Dementia screening using clinical instruments in the form of tests can be carried out very simply and quickly in family medicine clinics. Evidence of the use of numerous validated instruments for the assessment of cognitive status has great potential in identifying the risk of dementia [14].

Conclusion

Our research showed that all the instruments used to screen dementia in the elderly were effective, but with varying degrees of effectiveness. Future studies require the development and implementation of a new instrument of sufficient reliability with all indicators of cognitive status due to timely identification of dementia, as well as adequate treatment of persons with dementia with accompanying additional diseases.

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EVALUACIJA INSTRUMENATA ZA IDENTIFIKACIJU KOGNITIVNIH OŠTEĆENJA KOD STARIH OSOBA

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Sažetak: Demencija kod starih osoba je nedovoljno prepoznato stanje. Detaljna procjena kognitivnog statusa može omogućiti ranu identifikaciju visokorizičnih bolesnika koji su kandidati za demenciju.Kognitivna oštećenja imajuprevalenciju od 5,1–37,5%.Iako je kognitivna procjena kamen temeljac gerijatrijske njege, još uvijek ne postoji sveobuhvatan i lak za interpretaciju instrument, obećavajući potencijal za preporučeni sistem dijagnostikovanja demencije.Cilj ovog rada bio je da se uradi analiza dostupnih studija po pitanju pretraživanja načina procjene kognitivnog statusa i evaluacije korištenih instrumenata za skrining i kognitivnu procjenu kod starih osoba. Metode. Studije su preuzete preko elektronske baze PubMed, od januara 2013. do januara 2023.Elektronske baze su pretraživane definisanjem ključnih riječi (Cognitive impairment and Cognitive assessment and Cognitive screening tools and older people), korištenjem Boolean operatora AND i OR. Naslovi i apstrakti su pregledani, a ako je apstrakt ispunjavao kriterijume uključivanja, tekst je preuzet u cjelini. Rezultati. Pregledom PubMed baze podataka i strategijom istraživanja identifikovane su 56 studije. Nakon pregledanih radova u cjelini i prema jasno definisanim kriterijumima uključivanja studija, u završnu detaljnu analizu uključeno je šest radova. Diskusija. Identifikovana su 52 instrumenta za kognitivnu procjenu. Najčešće u upotrebi su bili Mini-mental test MMSE, Montreal Cognitive Assessment MoCA, Mini-Cog test, 6CIT. Dokazi upotrebe brojnih validiranih instrumenata za procjenu kognitivnog statusa, imaju veliki potencijal u identifikaciji rizika od demencije. Zaključak. Buduće studije zahtijevaju razvoj i implementaciju novog instrumenta dovoljne pouzdanosti sa svim indikatorima kognitivnog statusa zbog identifikacije demencije na vrijeme, kao i adekvatnog liječenja osoba sa demencijom uz prateća dodatna oboljenja.

Ključne riječi: starost, instrumenti, kognitivna procjena, demencija, stare osobe.