



Dementia Screening Tools in Primary Care: What is the Current Screening Tests Scenario?

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Abstract

More than 35 million people worldwide suffer from dementia syndromes, numbers that are expected to triple in up to 40 years and Brazil follows this trend of growth. As the world population is aging and in old age these syndromes are more common, health services are looking for ways to reduce the difficulties of assertive diagnosis of dementia syndromes in primary care. The objective of the study was to conduct a systematic literature review on the main tools used for the screening of dementia syndromes in primary care, in order to assess whether there is any more appropriate cognitive screening test. There was a systematic review of reviews, with pre-registration in PROSPERO 246275. The PubMed electronic database has been consulted for relevant publications. The review started on 20 August 2020. The following search strategies were employed: ((dementia (Mesh)) AND primary care (MeSH Terms)) AND ((diagnosis (MeSH Terms))). The publications returned by the search strategies were examined to identify possible duplicates and the remaining ones were examined in two stages. Two independent reviewers evaluated each article and inconsistencies in the inclusion decisions were remedied by discussion and consensus. Five specific articles on the theme were selected. It was concluded that the level of schooling directly focuses on the effectiveness and results of different tests, making it evident that effective tests for one population do not suit another and thus new, more complete tools need to be developed and applied for a broader screening capacity.

Keywords: Dementia syndromes; Diagnosis; Primary attention; Mental disorders

Introduction

The prevalence of dementia syndromes worldwide in 2010 was estimated at 35.6 million is expected to double in 20 years and triple in 40 years [1]. According to Smetanin et al., data evidence that in Canada it is projected to increase 2.5 times by 2038, and the economic burden of dementia will increase from \$15 billion in 2008 to \$153 billion in 2038 [2]. In Brazil, the average prevalence is higher than in the world; projections show a small growth in the rate of prevalence of dementia syndromes in the population aged 65 and older [3]. Research estimates that currently around 730,000 people have dementia and it is estimated that this number could reach 3,200,000 in 2040, with 81 million people worldwide affected by mental disorders [4].

In this sense, dementia syndromes are a public health issue and raise several concerns about aging: Such as loss of autonomy and the responsibility directed to the health system to be able to attend to it [1]. Despite a very prevalent clinical condition, there are still barriers to the assertive diagnosis of dementia syndromes primarily at the primary care level. The main difficulties include: Time limitations, knowledge, fear of misdiagnosis, lack of pay and lack of coordination between doctors and community services. As a result, dementia syndromes are often underdiagnosed in general practice [5].

Many previous studies suggest that Primary Care practitioners are unable to diagnose 29-76% of cases of dementia syndromes or likely dementia [5-7]. Most clinical guidelines, recommend maintaining an alert attitude and use of screening tests in suspected cases for early detection of these patients who are attended in primary care services [8-10]. Considering that early detection of cognitive impairment and dementia syndromes in primary care can produce benefits at different levels, including early diagnosis, access to treatments, promotion of psychological strategies to cope with the disease, and implementation

of social services, new approaches are needed to reduce rates of under diagnosis [11,12].

The screening performed is practically based only on cognitive assessment of the patient and on reports that are not standardized; there is no systematic practice in Primary Care for the rapid and simplified identification of dementia in the elderly, which makes it difficult to identify cases and refer to specialized professionals [13]. Thus, it is possible to understand the real reasons that hinder or prevent Family and Community Doctors from succeeding in the detection and early diagnosis of these syndromes.

In view of the importance of the topic, the objective of the study was to conduct a systematic review of the literature on the main tools used to screen for dementia syndromes in primary care, in order to assess whether there is any more appropriate cognitive screening test.

Materials and Methods

A systematic review was conducted, with pre-registration in PROSPERO 246275. The PubMed electronic database has been consulted for relevant publications. The review started on 20 August

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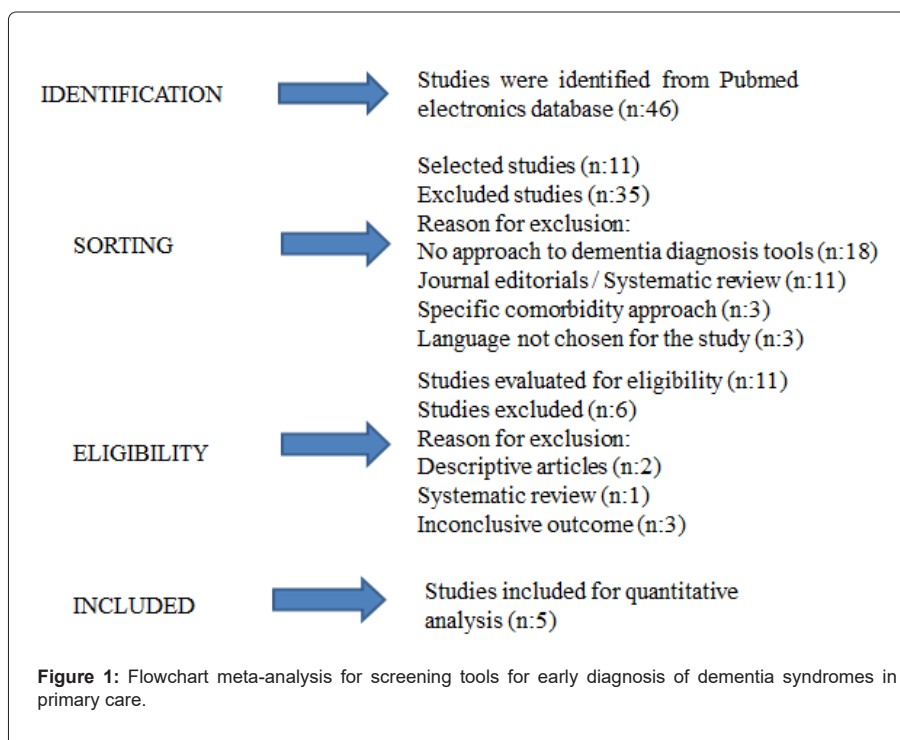
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Results

The first search for articles took place based only on the theme of studies and thus returned articles outside the established date, being disregarded in the screening. Review articles, case reports or descriptive were eliminated in the eligibility stage, as well as those with inconclusive outcome (outcomes in which there was no study conclusion). Finally, only 5 meta-analysis studies were considered eligible because they met all the criteria defined for the research. These studies were translated (when necessary) and evaluated for an overview of the data presented, as shown in Table 1.



| Title, year | Sample | Subjects | Place | Tests performed | Conclusion | Limitations |
|--|--------|--|--|---|--|---|
| Detecting MCI and dementia in primary care: efficiency of the MMS, the FAQ and the IQCODE, 2011 | 160 | - Age > 49 years, - An informant was available, and. | Seven Primary Care Clinics in Madrid - Spain | Mini mental state examination, IQCODE, Pfeffer Functional Activities Questionnaire (FAQ). | Cognitive impairment is probably underdiagnosed in primary care. The combination of the FAQ and MMS had excellent performance for detection of dementia; however, no satisfactory instrument or instrument combination was found for cognitive impairment. | - Age and education - Sample number - Multiple tracking tools used - High degree of complexity of some items of screening tests - Underlying causes of demential syndrome |
| Screening of dementia in the elderly: application of a questionnaire for screening in primary health care, 2017. | 43 | Individuals over 60 years old, residents of the city of Marília-SP and region. | Geriatric specialty outpatient clinic. | Questionnaire translated and then MEEM. | - Easy application. - Degree of schooling is indifferent to the result - No need for specialists. | It would be ideal for new studies with more statistical data and a deeper analysis of the issues. |
| Effectiveness and costs of phototest in dementia and cognitive impairment screening, 2011. | 140 | Individuals with suspected mild cognitive impairment or dementia | 4 APS centers in Spain | Fototest, MEEM E Memory impairment screen (MIS) | MIS and Fototest are more effective and less costly than MEEM without difference between it | It is not possible to extrapolate results to populations with a higher educational level. |

| | | | | | | |
|--|-----|---|--|--|--|---|
| A quick dementia screening tool for primary care physicians, 2011. | 188 | People over the age of 60 attending a geriatric clinic | Medical centers in Taiwan | MMSE, CSD, MiniCog test | A test of 8 items, taken from the MMSE, is a simple and sufficient tool for screening for early dementia in an APS clinic focused on attending to the elderly. | Higher number of false positives in populations with high prevalence of cognitive impairment |
| Two-Stage Screening for Early Dementia in Primary Care, 2016. | 257 | Patients with a low level of education of any race/ethnicity, 65 years or older, speak English or Spanish, have an informant, with no diagnosis of dementia in their digital medical record at screening. | Clinical Primary Care at Jacobi Medical Center in Bronx, NY. | Next Impairment Screen (MIS), Informant Questionnaire on Cognitive Decline in the Elderly-IQCODE, selective memory test with immediate call (pFCSRT+IR). | Unrecognized dementia is common in primary care. Case localization can be improved using two-stage screening strategies PBS (screening based on patient performance) or IBS (triage with informant). | - Difficulty for timely diagnoses due to financial problems. - 10 months between screening and diagnosis. - Possible false positives. - Performed in 2 primary care centers. |

Table 1: Summary of selected articles.

Discussion

In 2011 a study sought to evaluate the effectiveness and costs of the Phototest and screening of cognitive impairment using Phototest, Mini Mental State Examination (MMSE) and Memory Impairment Screening (MIS) for Dementia Screening (DEM) and Mild Cognitive Impairment (CLC) [14]. The study lasted more than a year. The patients were attended to in four different Primary care centers and later in Cognitive-Behavioral Neurology Unit. A total of 140 subjects were evaluated, among them 48 with MED, 37 with CLC, but without MED and 55 without CLC. The MIS test is not applicable to illiterates (20 individuals) or people with minimal reading capacity due to visual impairment (3 individuals), totaling 16.4% of the sample unable to respond to MIS. The MMSE has no effective and advantageous results, Phototest and MIS present better results with lower costs, resembling each other, both for the evaluation of DEM and CI. The data points out those educational factors have a direct relationship with the effectiveness of the instruments applied and, as the study counted on 51.7% of its sample of illiterate people or those with incomplete elementary schooling, the results cannot be applied to populations with a higher educational level. Effective tests should include populations of different specificities, as in the case of schooling, considering that primary care receives patients of the most diverse profiles.

In this respect it is considered relevant to provide some clarification on the tests. The Mini Mental State Examination (MEEM) is the most widely used test, but has drawbacks, is long and complex and requires the ability to read and perform tasks with paper and pencils. Other deficiencies include: Non-normal distribution of outcomes, high influence of socio-educational variables, and limited reliability and validity. The absence of a standardized version is an additional problem in countries where there are several versions that differ in words to remember, phrases to repeat, drawings to copy, and the order of items. Recommended instruments include the General Medical Assessment of Cognition (GPCOG), MiniCog, and Memory Impairment Screen (MIS), but have not been validated in some countries and are not suitable for use in individuals with low educational level, as they require the use of paper and pencils. The MIS evaluates the free evocation of 4 words and evocation facilitated by semantic clues and includes a distraction task during the 2-minute interval between reading and evocation. MIS requires reading ability and cannot be applied to illiterates. Phototest is a simple, short (<3 minutes) instrument that can be applied to illiterates and evaluates various cognitive fields (language, executive functions, episodic memory). It consists of three parts: A naming task with six color photographs of common objects in prototypical position; a verbal

fluency test (people names) has been shown not to be influenced by the level of schooling and free evocation and evocation facilitated by clues using the 6 objects in the naming test [14]. In Brazil, the screening for dementia syndromes does not follow defined standards for all health services. A study conducted with 43 elderly people from a geriatric clinic in the state of Sao Paulo was based on the translation of a questionnaire with closed questions and a mini mental status exam with a statistical analysis of the correlation between the results. Screening pointed out 8 patients with suspected dementia and 35 for non-dementia. It so happens that many patients (32) were illiterate and thus cannot adequately participate in the performance of some types of tests, making it evident that even with the adequate translation of tools used in other locations with good results, it should be considered that in the Brazilian population there is still a high percentage of illiterate individuals or with very low schooling, especially among the groups of older age [15].

Data indicate that primary care physicians may not be able to identify dementia syndromes or likelihood of their development, so early diagnosis does not occur and treatment does not begin to prevent the evolution of the condition. An evaluation of 188 patients over the age of 60 in a geriatric clinic showed that the test application of 8 items has sensitivity above 94% and specificity above 59%, and can be adjusted for cohorts of low schooling, and thus is a relatively effective test, with low costs and that offers an early warning about the development of dementia syndromes, assisting doctors active in primary health care, especially in regions where the levels of schooling are lower. With this, all the elderly can undergo screening and selection, and the effectiveness of this effort in public and private health increases.

To evaluate the effectiveness of three instruments for detecting cognitive deficits in primary care patients, 7 doctors recruited 160 patients over the age of 49, all complaining or suspected of some cognitive impairment. Mini-Mental State Test (MMS), the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) and the Pfeffer Functional Activities Questionnaire (FAQ) were applied as a way to understand if the association between the tests is more beneficial than their isolated application. Curve (AUC) and applied logistic regression analysis were used to measure the effectiveness of the combined tests. In the selected sample, 90 patients showed cognitive impairment, of which 15 with dementia. The combination of FAQ and MMS has demonstrated a much greater effectiveness than its isolated application; however, there is no indication of instrument or combination of them that is largely effective for evaluating cognitive impairment. The data indicates that the investigation of dementia syndromes relies on

tools that are more effective than when looking to evaluate a possible cognitive impairment. Cognitive tests therefore need to be reassessed and expanded so that they can produce better results [16].

Primary care needs to be prepared not only for simple care, but also for those that are more complex and involve dementia syndromes, since access to more advanced levels of health can be difficult in certain regions. An assessment of only low-level patients aged over 65 years, totaling 257, at a geriatric clinic in New York City was conducted from a 20-minute screening before or after the visit. Rapid screening tests were applied to characterize "no memory impairment", "no dementia impairment", or "dementia". Of the total sample, 66 patients met the criteria for dementia, being older than the average age of the patients without dementia, with no differences for gender, race, schooling, and length of residence in the US or time to evaluation. Depression is most commonly identified among patients with dementia. However, it should be noted that due to the lack of resources, only 38% of the selected patients had an adequate gold standard evaluation. The time between screening and diagnosis was on average 10 months, which also reduces the effectiveness of efforts in primary care [17].

Conclusion

The data made it clear that there is no tool widely applicable to all populations; each scenario has specificities that must be understood and valued for a more effective choice. It was found that the level of schooling directly focuses on the effectiveness and results of different tests, making it evident that effective tests for one population do not suit another and thus new, more comprehensive tools need to be developed and applied for a broader screening capacity. It is also necessary to show that different populations have different demands, demonstrating the need to understand in detail the population profile in order to make a better choice of the test to be applied.

The use of normative data is indispensable, given the understanding of the behavior of each tool for a specific population. A single tool is not capable of meeting all the population profiles, which indicates that the studies are essential for the understanding of the limitations and reach of each tool, directing the professionals to a precise decision making as to their choice for the specificities of the place in which it works.

Ethics Statement

This study used the existing and de-identified ALLHAT-Medicare linked datasets and there was no patient contact, therefore the consent form was waived. There is no health risk to the subjects under study. This study was approved by the Committee for Protection of Human Subjects at the University of Texas Health Science Center in Houston (Study ID: HSC-SPH-17-1035).

Author contributions

All authors declare no competing interests.

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