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SCREENING ELDERLY PATIENTS FOR COGNITIVE FUNCTION AT A REFERENCE CENTER IN NORTHEAST BRAZIL

RASTREIO DE PACIENTES IDOSOS PARA FUNÇÃO COGNITIVA EM UM CENTRO DE REFERÊNCIA NO NORDESTE DO BRASIL

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Abstract

Introduction: Both demographic and epidemiologic transitions experienced by the country in the past decades bring a number of crucial issues for the health care system, especially in the context of severe social inequality, poverty and fragility of institutions. **Objectives:** To identify the cognitive profile of non-institutionalized elderly outpatients seen at a reference center in São Luís, Brazil. **Methods:** Cross-sectional study conducted in a reference center in São Luís, MA, Brazil. Final sample consisted of 102 individuals. Inclusion criteria were: age equal to or over 60 years at first consultation, and ability to understand and to answer the tests for cognitive assessment. This study utilized 3 validated tests that have been widely used in Brazil, including the Mini-Mental State Examination (MMSE), the Verbal Fluency Test (VFT) and the Clock Drawing Test (CDT). **Results:** A total of 102 individuals were included. The majority of patients were women (72%), aged 60-64 years (33.3%), married or living in consensual union (43.1%), and had non-white skin color (52.9%). The prevalence of cognitive impairment was 60.7% for the Mini-mental state examination, 23.5% for the Verbal Fluency Test and 59.8 % for the Clock Drawing Test. Regarding the presence of cognitive impairment in at least one test, a total of 83.3% was observed. There was an association between the occurrence of cognitive impairment with both marital status and self-perception of health status ($p < 0.05$). **Conclusions:** Hence, in the present study, the occurrence of cognitive impairment was considered high and might be associated with marital and health status.

Keywords: Health of the Elderly. Aging. Cognition.

Resumo

Introdução: *As transições demográficas e epidemiológicas experimentadas pelo país nas últimas décadas trazem uma série de questões cruciais para o sistema de saúde, especialmente no contexto de grave desigualdade social, pobreza e fragilidade das instituições.* ***Objetivos:*** *Identificar o perfil cognitivo de pacientes idosos não institucionalizados atendidos em um centro de referência em São Luís, Brasil.* ***Métodos:*** *Estudo transversal realizado em um centro de referência em São Luís, MA, Brasil. A amostra final foi de 102 indivíduos. Os critérios de inclusão foram: idade igual ou superior a 60 anos na primeira consulta e capacidade de compreender e responder aos testes de avaliação cognitiva. Este estudo utilizou 3 testes validados que têm sido amplamente utilizados no Brasil, incluindo o Mini-Exame do Estado Mental (MMSE), o Teste de Fluência Verbal (VFT) e o Teste de Desenho do Relógio (TDC).* ***Resultados:*** *Foram incluídos 102 indivíduos. A maioria dos pacientes era do sexo feminino (72%), com idade entre 60 e 64 anos (33,3%), casada ou vivendo em união consensual (43,1%) e tinha cor da pele não branca (52,9%). A prevalência de comprometimento cognitivo foi de 60,7% para o miniexame do estado mental, 23,5% para o teste de fluência verbal e 59,8% para o teste de desenho do relógio. Em relação à presença de comprometimento cognitivo em pelo menos um teste, foi observado um total de 83,3%. Houve associação entre a ocorrência de déficit cognitivo tanto com o estado civil quanto com a autopercepção do estado de saúde (p <0,05).* ***Conclusões:*** *Assim, no presente estudo, a ocorrência de déficit cognitivo foi considerada alta e pode estar associada ao estado civil e de saúde.*

Palavras-chave: *Saúde do Idoso. Envelhecimento. Cognição.*

Introduction

Population aging is a global phenomenon in both developed and developing countries. In Brazil, individuals aged 60 years and over represent more than 13% of the population[1]. Both demographic and epidemiologic transitions experienced by the country in the past decades bring a number of crucial issues for the health care system, especially in the context of severe social inequality, poverty and fragility of institutions[2]. In the next years, the number of people over 60 years is expected to increase globally, and in 2050, the elderly will reach 20% of world population, most of whom living in developing countries[3].

The biggest challenge in caring for elderly people is to contribute, despite the progressive limitations that may occur, for rediscovering the ability to live their own life with the highest possible quality[4]. This possibility increases as society considers family and social context and can recognize the potential and value of elderly people, because part of their difficulties is more related to a culture that devalues and limits them[5]. Senescence is organic, morphological and functional changes that occur as consequence of aging process, senility and modifications determined by disorders that often compromise elderly. The differentiation between these two conditions is sometimes very difficult, with situations in which it is very difficult to establish whether a particular change is senescence manifestation or senility[6].

Normal aging involves a gradual decline in cognitive function, dependent on neurological processes that change with age. Memory losses, may be reflected in difficulty for remembering names, phone numbers or stored objects for

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example[7]. Scazujca et al.,[8] found no curate estimates of the prevalence of dementia in developing countries. In Brazil, in an original study by Herrera et al.,[9] the prevalence rate of dementia was 7.1% and, in early pre-clinical stages, memory loss preceded the loss of other cognitive domains.

The difference related to the aging process between developed and developing countries is that, in the developed ones, aging slowly occurred and is associated with improvement in general living conditions and in developing countries, this process is quickly happening, without time for an appropriate social and health reorganization to meet the new emerging demands[10]. During aging process, 15% of people initially develop progressive cognitive impairment. Of this total, about 5% of people over 65 and 20% over 80 years old develop moderate to severe dementia[11].

Given the scenario of decline in cognitive function due to the aging process, this study was aimed at identifying the cognitive profile of non-institutionalized elderly in São Luís, Brazil.

Methods

This is a cross-sectional study conducted in a reference center in São Luís, Brazil, with individuals aged over 60 years old (mean age: 69.83 ± 7.57). Sample size was calculated considering a cognitive impairment prevalence of 15% in elderly, sampling error of 5%, and confidence level of 95%. A total of 106 elderly patients were then interviewed, but there were 4 losses due to missing data, and the final sample consisted of 102 individuals. Inclusion criteria were: age equal to or over 60 years at first consultation, and ability to understand and to answer the tests for cognitive assessment. Those who presented with visual or hearing impairment, neurologic, mental or motor disorders or who declared themselves unable to answer the survey were not included.

This study utilized 3 validated tests that have been widely used in Brazil[12], including the Mini-Mental State Examination (MMSE), the Verbal Fluency Test (VFT) and the Clock Drawing Test (CDT).

MMSE consists of questions grouped into 7 categories, each are planned in order to assess specific cognitive functions, which are orientation in time (5 points), spatial orientation (5 points), immediate memory (3 points), attention and calculation (5 points), memory recall (3 points), language (8 points) and constructive vision capability (1 point). The MMSE scores range from 0 to 30 points, and the lower the value, the worse the cognitive performance[13]. A cutoff point of 24 was used as defined by Bertolucci et al.,[14] which is more suitable for cognitive impairment rating.

The VFT is a simple tool, which aims at evaluating the performance in generating words and the larger amount possible of the same semantic category for one minute. The test provides information about the storage capacity of the semantic memory system, the ability to recovery the stored information in memory and processing of executive functions, particularly those through the ability to organize thinking and the strategies used to search words[15]. In this study, the category animals were used. Two cut off levels were adopted to define cognitive impairment according to Brucki et al.,[16] nine cutoff level for up to eight years of incomplete study and thirteen for those with eight or more years of study.

The CDT consists of the task of design a clock with the insertion of pointers setting two hours and forty-five minutes. It aims at evaluating executive functions (planning, logical sequence, abstraction capability and execution monitoring), spatial organization, visual-constructive praxis, psychomotor coordination and recent memory. A cut off point less or equal to six for cognitive impairment identification was used[17].

Data analysis was performed using STATA (version 12) and included descriptive statistics and the Fisher exact, Chi-squared and Mann Whitney tests at a 5% significance level.

This study was approved by the Research Ethics Committee of the University Hospital of the Federal University of Maranhão, (protocol 473169). Participation was voluntary and written informed consent was obtained from all participants.

Results

A total of 102 elderly at first consultant were assessed which 72% were women, aged 60 to 64 years old (33.3%), married/consensual union (43.1%), non-white (52.9%), with low education (66.6%), retired (66.6%) and family income equal to or less than two minimum wages (71.4%) and living with family (41.1%). The most referred morbidity was hypertension (56.8%), followed by osteoarticular disease (52.9%), and 77% did not practice regular physical exercise (Table 1).

Table 1 - Socio-demographic characteristics of non-institutionalized elderly patients. São Luís-MA / Brazil, 2017.

Variables	n	%
Sex		
Male	28	27.4
Female	74	72.5
Age		
60-64	34	33.3
65-69	19	18.6
70-74	24	23.5
75-80	14	13.7
Over 80	11	10.7
Marital Status		
Married/Consensual union	44	43.1
Single	24	23.5
Divorced	08	07.4
Widow	26	25.4
Race/Skin color		
Brown	54	52.9
White	20	19.6
Non-white	27	26.4
Asiatic	01	00.9
Education level		
Illiterate	19	18.6
1-4 years	49	48.0
5-8 years	21	20.5
9-11years	08	07.8
Over 11 years	05	04.9
Ocupation		
Employee	06	05.8
Retired	66	66.6
Housewife	02	01.9
Pensioner	12	11.7
Others	14	13.7
Family income		
Up to 1/2 minimum wage	10	09.8
1/2 to 1 minimum wage	32	31.3
1 to 2 minimum wages	31	30.3
2 to 4 minimum wages	17	16.6
Over 4 minimum wages	12	11.7
Household		
Alone	05	04.9
With family	42	41.1
With children	27	26.4
With spouse/partner	17	16.6
Others	11	10.7

Regarding the tests for detecting cognitive impairment, in MMSE, 60.7% were below the cutoff point indicating cognitive impairment. In VFT, 23.5% had alterations and in CDT 59.8% had changes. When MMSE was corrected by education, 75.4% were rated below the cutoff point. From the studied elderly, 83.3% had at least one test with changes and 16.6% had alterations in the three tests (Table 2).

Table 2 - Frequencies of the scores obtained from cognitive impairment tests in non-institutionalized elderly patients. São Luís-MA / Brazil, 2017.

Variables	n	%
MMSE*		
Normal	40	39.2
With alterations	62	60.7
MMSE* / Level of education		
Normal	25	24.5
With alterations	77	75.4
Verbal Fluency		
Normal	78	76.4
With alterations	24	23.5
Clock Drawing test		
Normal	41	40.2
With alterations	61	59.8

*Mini-Mental State Examination.

A higher prevalence of cognitive impairment was observed at age from 60 to 64 years (28.5%) and from 70 to74 years (27.2%). Widow elderly presented higher cognitive alterations compared with other categories, showing a statistically significant association (p = 0.018). The proportion of patients with cognitive impairment who considered their health as regular and poor/very poor was higher than those who did not show alterations in tests (p = 0.040). According to the level of education, a higher proportion of cognitive alterations in illiterate people and individuals with up to 4 years of study were observed (Table 3).

Table 3 - Variables associated with cognitive impairments in non-institutionalized elderly patients. São Luís-MA / Brazil, 2017.

Variables	Cognitive Impairments				p value
	Absent (n=25)		Present (n=77)		
	n	%	n	%	
Sex					
Male	06	24.0	22	28.5	0.656#
Female	19	76.0	55	71.4	
Marital Status					
Married/Consensual union	14	56.0	30	38.9	0.018*
Single	07	28.0	17	22.0	
Divorced	03	12.0	05	06.4	
Widow	01	04.0	25	32.4	
Self-perception of health status					
Very good/Good	10	40.0	12	15.5	0.040#
Regular	11	44.0	49	63.6	
Poor/ Very poor	04	16.0	16	20.7	
Physical activity					
No	19	76.0	60	77.9	0.842#
Yes	06	24.0	17	22.0	
Educational level					
Illiterate	02	08.0	17	22.0	0.193*
1-4 years	11	44.0	38	49.3	
5-8 years	09	36.0	12	15.5	
9-11years	02	08.0	06	07.7	
Over 11 years	01	04.0	04	05.1	

#According to the Chi-squared test. *according to the Fisher exact test.

Discussion

The prevalence of cognitive impairment in this study was considered high compared to the study conducted by Gurian et al.,[11] which showed 18.3% of the elderly with cognitive impairment as well as a survey carried out in seven urban centers in Latin America and the Caribbean, which found a frequency of 6.9%.[18] However, a study conducted in conducted in a Brazilian hospital found a frequency of 29%,[19] similar to that found by Neri et al.,[20] which observed that 24.8% of elderly from seven Brazilian cities had cognitive impairment.

Among the surveyed elderly, women had a higher percentage of cognitive alterations, similar to results found by Coreia et al.,[21] in a study conducted in two Brazilian public hospitals, which found a prevalence of 31.2% among women. The results of the MMSE in this study showed a prevalence of cognitive impairment considered high and the CDT showed that half had results below the cutoff point. The VFT revealed a lower percentage of alterations compared to the other two tests. Although the presence of cognitive impairment in only one test was high, when the presence of deficit in the combination of the three tests was verified, the deficit was much lower.

There is no screening test that allows a perfect detection of dementia with 100% specificity and 100% sensitivity. Alternatives are being employed to improve the accuracy of screening instruments, and the combinations of tests are among these modalities[22]. In a study that relates the performance in cognitive tests with subsequent development of Alzheimer disease, researchers concluded that there is a pre-clinical phase of lowering of cognitive function preceding in many years the emergence of Alzheimer. These frames are frequent and unnoticed and there is a need to distinguish between the early signs of disease and alterations associated with normal aging process[23]. The use of combined tests is recommended to those patients with suspicion of mild cognitive decline, whether dementia or mild cognitive impairment[24].

The elderly individuals evaluated in this study had low education status, family income equal to or below 2 minimum wages, comorbidities and osteoarticular diseases, and reported no regular practice of physical activity. A study conducted by Gurian et al.,[11] showed that elderly people who had the highest scores were associated to factors such as age (60-69 years), level of education, reading habits, good social relations, and no associated comorbidities.

Limitations of the present study include the cross-sectional design, which did allow the longitudinal evaluation of patients and the small sample size. Nonetheless, we emphasize the relevance of the early detection of cognitive impairment towards providing opportunities of appropriate treatment and prevention actions, thereby contributing to the life quality of elderly population.

In summary, a high prevalence of cognitive impairment was shown, indicating the need for the use of screening tests as a routine protocol component in the care of elderly in health services, in order to perform an earlier diagnosis of mild cognitive impairment or possible dementia.

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