Tracking cognitive deficit in elderly with diabetes mellitus

Rastreamento de déficit cognitivo em idosos com diabetes mellitus

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Abstract

To track the cognitive deficits of type 2 diabetics and to correct the cognitive deficit with socioeconomic and demographic data. An analytical, cross - sectional study of a quantitative approach, carried out with 240 elderly patients attending the endocrinology department of the University Hospital Presidente Dutra in São Luís - MA. Two instruments were used for the collection: the first one on the socioeconomic and demographic characteristics of the elderly and the second called Mini-Mental State Examination -MEEM. Epiinfo version 7.1.4 was used to calculate the relative frequencies and cross-referenced variables such as age, sex, race / color, occupation, income, marital status and schooling, with MMSE results. significance level p <0.05. The highest prevalence of elderly people with a probable cognitive deficit (57.5%), among them, the most prevalent female sex (73.9%), brown race (73.9%), one to three years of complete study 82.4%), married (43.5%), retired (82.6%), with a monthly income of a minimum wage (69.9%). Based on these data, the importance of an overall evaluation of these elderly people and of public policies aimed at the integral promotion of the health of the elderly for an early detection of these cognitive declines, as well as to detect early signs of these early, as they may be a percussion of dementia and consequently disorders generated in the individuals, family and society.

Keywords: Aging. Cognition. Diabetes Mellitus. Geriatric Assessment.

Resumo

Rastrear o déficit cognitivo de idosos diabéticos tipo 2 e correferir o déficit cognitivo com dados socioeconômicos e demográficos. Estudo analítico, transversal de abordagem quantitativa, realizado com 240 idosos atendidos no setor de endocrinologia do Hospital Universitário Unidade Presidente Dutra em São Luís - MA. Foram utilizados dois instrumentos para coleta: o primeiro sobre as características socioeconômicas e demográficas dos idosos e o segundo chamado Mini-Exame do Estado Mental - MEEM. Com o programa estatístico Epiinfo versão 7.1.4 calculou-se as frequências relativas e fez-se o cruzamento entre variáveis: idade, sexo, raça/cor, profissão, renda, estado civil e escolaridade, com resultados do MEEM, onde se admitiu como nível de significância p<0,05. A maior prevalência de idosos com provável déficit cognitivo (57,5%), dentre estes, o sexo feminino mais prevalente (73,9%), raça parda (73,9%), um a três anos de estudo completos (82,4%), casados (43,5%), aposentados (82,6%), com uma renda mensal de um salário mínimo (69,9%). A partir desses dados, verifica-se a importância de uma avaliação global desses idosos e de políticas publicas voltadas a promoção integral da saúde do idoso para uma detecção precoce desses declínios cognitivos, como também detectar precocemente sinais iniciais destes, pois podem ser um percussor de demência e consequentemente desordens geradas futuramente nos indivíduos, família e sociedade.

Palavras-chave: Envelhecimento. Cognição. Diabetes Mellitus. Avaliação Geriátrica

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INTRODUCTION

Brazil is undergoing a period of profound change in health and disease patterns due to the demographic transition, where there is a significant increase in chronic non-communicable diseases[1]. Diabetes Mellitus (DM) has been gaining prominence among chronic-degenerative diseases, considering its incidence and prevalence in the population of those over 60 years of age. Diabetes mellitus type 2 (DM2) is the most prevalent in this age group, recent statistics indicate that 1 in 4 elderly individuals are carriers of DM2[2].

In addition to the micro and macrovascular complications that diabetes mellitus can cause, DM2 has been one of the major public health concerns, as evidence indicates a positive relationship between DM2 and cognitive decline. Studies that analyze this association between the prevalence of diabetes and cognitive alterations in the elderly have shown that elderly people with DM2 present worse cognitive performance, suggesting the DM2 as an aggravating factor in the performance of the cognitive capacity in which even without clear pictures of dementia certain cognitive domains such as attention, memory, executive functions and frontal lobe, can be impaired[3,4,5].

The early detection of cognitive alterations contributes directly to the neuropsychological evaluation and the management of pathological cognitive aging, facilitating the therapeutic behavior during the onset of neurodegenerative diseases. However, it is a difficult task due to the number of variables that influence this detection, such as genetic susceptibility, old age, family history of dementia, morphological aspects of the brain, depression and schizophrenia[6, 7].

Considering that one of the consequences of the most incapacitating forms of aging for the elderly is cognitive decline, studies that investigate the risk factors for this decline are necessary. The present study aims to track the cognitive deficit of type 2 diabetics; characterize socioeconomic and demographic variables and correct socioeconomic and demographic variables with cognitive deficit.

METHODS

An observational, analytical, cross-sectional study based on the assumptions of the quantitative research linked to the Study and Research Group Nursing Education and Care: a focus on the Health of the Elderly (NUPECE). The study was approved by the Committee of Ethics in Research with opinion / CEP-HUUFMA of the University Hospital Unit Presidente Dutra with opinion nº 1.297.555.

The sample was non-probabilistic of convenience. Elderly patients diagnosed with Diabetes Mellitus were interviewed at the endocrinology outpatient clinic of the Presidente Dutra University Hospital of the Federal University of Maranhão (HUPD), in São Luís - MA, Brazil. And who met the following inclusion criteria: Being 60 years old or older, having a Diabetes diagnosis confirmed for at least one year. As an exclusion criterion we have already used a proven medical diagnosis of previous and / or progressive neurodegenerative disorders.

In order to identify the socioeconomic and demographic situation, an instrument was used that contains the following variables: name, age, sex, race / color, profession, income, marital status, illiteracy, 1-3 years of schooling, 4-7 years > 7 years of study). The Mental State Mini Exam (MMSE) was used to track cognitive deficit 8. The Mental State Mini Exam (MMSE) was used to track cognitive deficit [8].

The MMSE is composed of seven categories, each one with the objective of evaluating a group of specific cognitive functions: temporal orientation, spatial orientation, immediate memory, attention and calculation, recall memory, language and visual constructive capacity. Their total score can range from zero to a maximum of 30 points[9].

In order to evaluate the presence or absence of cognitive deficit, a cutoff point was used by the Ministry of Health[10], which considers

the educational levels for this analysis, taking into account the years of study as follows: it considers a cognitive deficit: the illiterate or individuals who scored equal to or below 19, of those who had 1 to 3 years of schooling those who were equal to or below 23, 4 to 7 years of study equal to or below 24, and those with more than 7 years of study equal to or below 28. At the time of the data collection, the objectives and procedures of the research were explained and the request for signing the free and informed consent form was signed. The term meets the requirements contained in current legislation on research involving human beings, according to Resolution No. 466/2012 of the National Health Council.

The data was tabulated in the Microsoft Office Excel® 2010 for Windows 2010 program. The relative and absolute frequencies were calculated using the Epiinfo version 7.1.4 statistical program, where the frequency comparisons between age, sex, race / color, occupation, income, marital status and schooling were calculated using the Chi-Square test ; and the mean MMSE comparisons, where it was accepted as significance level $p < 0.05$.

RESULTS

The female sex predominated, represented by 67.5% (n = 162). Regarding color / race, the majority reported being of the brown color represented by 60.0% (n = 144), secondly the color was black (20%) and lastly we had 2.5% of the elderly who ignored race.

The minimum age was 60 years and the maximum was 86, reaching an average of 71.4 years. Regarding the profession / occupation, the highest frequency was retired people represented by 81.7% (n = 196), secondly they were autonomous with 6% (n = 12) and in last place we had the profession of fisherman with 0.8% (n = 2). The most prominent monthly income was minimum wage (77.5%), secondly we had two to three times minimum wage (15%) and in last place we had a value of 5% for older people with lower monthly income than minimum wage. In relation to marital status, there was a predominance of married / stable union (55.0%) and a lower prevalence of separated / divorced persons with 2.5%.

When asked about the level of schooling, the majority answered that they had one to three years of study (57.5%), and a total (17.5%) had more than seven years of study. With the application of the Chi-square test between the MMSE result and the value of the race variable (p = 0.0007), income (p = 0.00353), marital status (p = 0.0003) and schooling = 0.00001) there was a significant statistical difference (Table 1).

The MMSE mean was 24.3 among all the elderly interviewed. In this context, of the 240 elderly interviewed, 57.5% presented cognitive deficit (n = 138) (Table 2).

Table 1 – Socioeconomic and demographic data of elderly people with DM with and without cognitive deficit, São Luís-MA, 2015.

Variables	Cognitive deficit				Total		p
	Yes		No				
	N	%	N	%	N	%	
Gender							0.0810
Female	102	73.9	60	58.8	162	67.5	
Male	36	26.1	42	41.2	78	32.5	
Total	138	57.5	102	42.5	240	100.0	

to be continued...

...continuation - Table 2

Race							0.0007
Caucasian	12	8.7	30	29.4	42	17.5	
Afro	24	17.5	24	23.5	48	20.0	
Brown	102	73.9	42	41.1	144	60.0	
Ignored	0	0.0	6	5.9	6	2.5	
Total	138	57.5	102	4.,5	240	100.0	
Profession							0.7438
Retired	114	82.6	82	80.3	196	81.7	
Self- employed	6	4.3	6	5.9	12	6.0	
Housewife	12	8.7	6	5.9	18	7.5	
Public Agent	6	4.3	6	5.9	12	5.0	
Fisherman	0	0.0	2	2.0	2	0.8	
Total	138	57,5	102	42.5	240	100.0	
Income							0.00353
< Minimum wage	12	8.7	0	0.0	12	5.0	
Minimum wage	96	69.6	90	88.2	186	77.5	
From 2 to 3X min wage	24	17.4	12	11.7	36	15.0	
From 4 to 5X min wage	6	4.3	0	0.0	12	2.5	
Total	138	57.5	102	42.5	240	100.0	
Marital Status							0.0003
Married/ Common Law	60	43.5	72	70.6	132	55.0	
Single	24	17.4	0	0.0	24	10.0	
Separate /Divorced	0	0.0	6	5.9	6	2.5	
Widow	54	39.1	24	23.5	78	32.5	
Total	138	57.5	102	42.5	240	100,0	
Education (Years of Study)							0.00001
0 years of study	30	21.7	8	78	38	15.0	
1-3 years of study	86	62.3	52	51.0	138	57.5	
4-7 years of study	16	11.6	8	7.8	24	10.0	
> 7 years of study	6	4.3	34	33.3	42	17.5	
Total	138	57.5	102	42.5	240	100.0	

SOURCE: Own Author

Table 2 – Test result MEEM, São Luís – MA, 2015.

Cognitive deficit	N	%
Yes	138	57.5
No	102	42.5
Total	240	100.0

SOURCE: Own Author

DISCUSSION

The results of this study allowed us to identify that the prevalence of the elderly studied showed a poor performance in the MMSE, indicating a probable relationship between DM and probable cognitive deficit.

The MMSE is the most used cognitive screening test for adults and older people in the world, both for its practicality and for the wide evaluation it performs. Because of this, it is considered the first choice test among psychiatrists, neurologists, geriatricians and psychologists.

In Brazil, it is the instrument recommended by the Ministry of Health for the cognitive evaluation of the elderly contained in the Notebook of Basic Attention - nº 19 - Aging and Health of the Elderly[10]. It should be emphasized that although it is a very objective instrument, it only tracks cognitive deficiencies and should not be used alone to diagnose[11].

The mean MMSE below the cutoff point of the elderly with DM2 corroborated with the main studies in the literature[4, 5].It is important to emphasize that to date, there is no consensus regarding cut-off points for cognitive decline in Brazil. The Brazilian version of the test used by Bertolucci et. Al. 1994[9] provides a single cut note of 25 points. However, schooling has received special attention, being the object of analyses carried out with different samples, aiming at the adequacy of cut-off points, since the performance in the MMSE is strongly influenced by schooling[11].

In the present study, the educational variable presented statistical significance. The elderly who had one to three years of schooling presented worse performance in the test, which corroborates with a study carried out with 81 elderly women with T2DM that pointed out that the lower the schooling, the worse the performance in the MMSE[3].

In a study carried out with elderly individuals of 70 years or older, cognitive screening tests were performed, among the tests applied, the MMSE. The results obtained were 91% of elderly patients with DM2 presented cognitive decline and the main characteristics were: age advancement, negligence in the use of antihypertensives and insulin and low level of schooling. In the same study, schooling influenced the speed of processing, attention, executive functions, memory and intelligence, demonstrating that education may reflect healthier aging or not during the years of life[12].

Income was a variable that showed statistical significance. Elderly people with a minimum wage income predominated. According to IBGE 2016[13], 48.1% of the elderly have income from all sources equal to or greater than minimum wage, while about one in four elderly people live in households with monthly income per capita of less than minimum wage.

Income is a determining factor in the health situation of the elderly with DM, since it is at this stage that there is a greater need for medication, food and other costs. It is worrying that 77.5% of the elderly interviewed have minimum wage income because, due to the many changes that have occurred in family arrangements in recent times, the elderly may face a situation in which they are forced to support unemployed relatives or sick and provide for the family. This situation favors the greater vulnerability of the elderly and can bring losses to their basic needs

and quality of life[14].

In the present study, the brown race predominated among the elderly. This was corroborated by the study by Moretto et. al (2016) [15] on the association between color / race, obesity and diabetes in the elderly.

On the other hand, Viegas[16] in his study in Porto Alegre identified that the white race was predominant with 82.5%. This discrepancy between the studies can be justified by the 2010 census data, [13] which shows a variation of the predominance of race / color according to the region of the country. According to the IBGE[13]. 60% of the people in the northeast region declared themselves to be brown, unlike the southern region where 78% of the population declared themselves to be white.

Oliveira et. al. [17] in his study that analyzed the association of brown race and health indicators in the elderly reveals that the aging among blacks and browns in Brazil happens in context of significant inequalities. These, in turn, are in the worst social and health indicators, are those that depend exclusively on the public health system, the poorest and with low schooling. In addition, it is the elderly who most self-refer with the worst health status, in addition to presenting a high prevalence of chronic diseases. This fact can be attributed to the fact that these elderly people are exposed to risk factors in an unequal way, and the individual and contextual characteristics will directly influence the adoption of life habits that will be harmful or not to physical and cognitive health.

The prevalent marital status is married / stable marriage, this reveals the importance of having the spouse or any other family member as support for the treatment of diabetes mellitus, since living alone is a predisposing factor for the development of loneliness, depression and psychic problems in the elderly, which could aggravate the elderly's cognitive health and quality of life. The family is the main supportive system of the elderly, being the family structure of fundamental importance for the maintenance of health care, besides being the first social network to support the individual, contributing to the prevention of damages caused by the interruption of pharmacological treatment and to exercise a protective function in the face of the tensions generated by everyday life. According to Andrade and Martins [18, 19], family support has direct implications on the well-being of the elderly and their quality of life.

CONCLUSION

The results of the study suggest strong indications of a directly proportional relationship between diabetes mellitus and cognitive decline, as it resulted in 57.5% of the population with probable cognitive deficit. It also evidenced the higher prevalence in less educated elderly groups, clearly demonstrating the importance of education for a better aging. Thus, it is necessary to emphasize the need to deepen the research, with differentiated methods, which can reveal more concrete results on this particular object.

The development of research and studies in this area aims to guarantee the elderly population the development of means to combat the delay of the most serious effects of this cognitive impact, through the early screening of this part of the population. Studies guarantee an anticipation of this impact helps the nursing professionals in the development of techniques and management in the treatment of these cases.

In this sense, the present study focused on tracking the number of diabetic elderly individuals with cognitive deterioration, in order to awaken in health professionals and in the general academy the importance of studying more deeply what may be a new complication of diabetes and, above all, contribute significantly to an improvement in the quality of life of the elderly.

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REFERENCES

1. Damasceno BP. Demências. In: Guariento MH, Neri AL, organizadores. Assistência Ambulatorial ao Idoso. Campinas: Alínea, 2010. 241 – 254.
2. Freitas EV. Diabetes melito. In: Freitas EV, Py L. Tratado de Geriatria e Gerontologia. 3ª edição. Rio de Janeiro: Guanabara Koogan; 2011.p.808-822.
3. Costa LDLN, Verzaro PM, Ericeira VVL et al. Cognitive deficit in older women with type 2 diabetes mellitus. J Nurs UFPE on line. 2016;10(8):2818-24.
4. Ferreira MC, Tozatti J, Fachin SM, Oliveira PP, Santos RF, Silva MER. Redução da mobilidade funcional e da capacidade cognitiva no diabetes melito tipo 2. Arq Bras EndocrinolMetab [Internet]. 2014 [cited 2017 Aug 27]; 58(9): 946-952. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0004-27302014000900946&lng=en. http://dx.doi.org/10.1590/0004-2730000003097.
5. VargasLS, Lara MVS, Mello-Carpes PB. Influência da diabetes e da participação em grupos de terceira idade na cognição. RevBrasGeriatrGerontol, 2014; 17(4):867-8.
6. Canineu PR, Samara AB, Stella F. Transtornos cognitivo leve. . In: Freitas EV, Py L. Tratado de Geriatria e Gerontologia. 3ª edição. Rio de Janeiro: Guanabara Koogan; 2011.p.167-177.
7. Coelho FGM. et al. Desempenho cognitivo em diferentes níveis de escolaridade de adultos e idosos ativos. Ver. Bras. Geriatr. Gerontol. 2012; 15(1): 07-15.
8. Folstein, M. F.; Folstein, S. E.; Mchugh, P. R.; Mini-mental state: a practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatry Research. 1975;12(3),189-198.
9. Bertolucci, P. H. F.; Brucki, S. M. D.; Campacci, S. R.; Juliano, Y.; O Mini Exame do Estado Mental em uma população geral: impacto da escolaridade. Arq Neuropsiquiatria. 1994; 52:1-
10. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde, Departamento de Atenção Básica. Envelhecimento e saúde da pessoa idosa. Brasília, DF, 2006.
11. Melo DM, Barbosa AJG. O uso do Mini-Exame do Estado Mental em pesquisas com idosos no Brasil: uma revisão sistemática. Ciência & Saúde Coletiva, 20(12):3865-3876, 2015.
12. Bruce DG, Davis WA, Casey GP, Starkstein SE, Clarnette RM, Almeida OP, et al. Predictors of cognitive decline in older individuals with diabetes. Diabetes Care. 2008;31(11):460-72.
13. Brasil. Instituto Brasileiro de Geografia e Estatística. Estudos e pesquisas: informação demográfica e socioeconômica: síntese dos indicadores sociais. Rio de Janeiro. 2016
14. Borba AKOT, Marques APO, Leal MCC, Ramos RSPS, Guerra ACCG, Caldas TM. Adesão à terapêutica medicamentosa em idosos diabéticos Rev Rene. 2013; 14(2):394-404.
15. Moretto MC, Fontaine AM, Garcia CAMS, Neri AL, Guariento ME. Associação entre cor/raça, obesidade e diabetes em idosos da comunidade: dados do Estudo FIBRA. Cad. Saúde Públic. 2016;32(10):1-12.
16. Viegas K. Prevalência de diabetes mellitus na população de idosos de porto alegre e suas características sociodemográficas e de saúde. Porto Alegre. Tese [Doutorado em Gerontologia Biomédica]. Instituto de Geriatria e Gerontologia da Pontifícia Universidade Católica do Rio Grande do Sul; 2009.
17. Oliveira BLCA, Thomaz EBAS, Silva RA. Associação da cor/raça aos indicadores de saúde
para idosos no Brasil: um estudo baseado na Pesquisa Nacional por Amostra de Domicílios(2008). Cad. Saúde Pública. 2014; 30(7):1-15.
18. Sass A, Gravena AAF, Pilger C, Mathias TAF, Marcon SS. Depressão em idosos inscritos no Programa de Controle de hipertensão arterial e diabetes mellitus. Acta Paul Enferm. 2012;25(1):80-85.
19. Andrade INPA; Martins, RML. Funcionalidade familiar e qualidade de vida dos idosos. Milllenium. 2016; 40:185-199.

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