

ARTERIAL HYPERTENSION – ASSOCIATED RISK FACTOR IN ALZHEIMER DISEASE

LIANA PRODAN¹, M. PEREANU²,

^{1,2}”Lucian Blaga” University of Sibiu,

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Abstract: Dementia is a neurological disorder that is associated with age advancing. The incidence and prevalence of dementia are increasing at the same time with population aging. The most common forms of dementia are Alzheimer's disease (AD) and vascular dementia (VaD). It is important to distinguish between the two forms of dementia because each has different treatments and risk factors. Both are frequent and can be prevented. This article refers to high blood pressure as a risk factor in the patients diagnosed with probable AD.

Cuvinte cheie: demența, boala Alzheimer (AD), factori de risc vascular în demenția

Rezumat: Demența este o boală neurologică, care se asociază cu înaintarea în vârstă. Incidența și prevalența demenței sunt în creștere odată cu îmbătrânirea populației. Cele mai frecvente forme de demență sunt boala Alzheimer (AD) și demența vasculară (VaD). Este important să se facă distincția între cele două forme de demență, deoarece au tratamente diferite și factorii de risc pentru fiecare sunt frecvenți și pot fi preveniți. Prezentul articol se referă la hipertensiunea arterială ca și factor de risc prezent la pacienții diagnosticați cu AD probabilă.

INTRODUCTION

Dementia is defined as a neurological syndrome consisting of impaired cognition, which is sufficiently severe as to interfere with social or occupational functioning.(1) Some of the risk factors for dementia are recognized as being advanced age, family history, education level and the presence of vascular risk factors. The most common forms of dementia are Alzheimer's dementia (AD) and vascular dementia (VaD).(3) The AD prevalence is of 4.4% and the VaD is of 1.4%.(2)

According to NINCDS-ADRDA criteria, AD is a progressive neurological disease characterized by memory loss, behaviour change and the overall deficit of the daily functional activities.(4) Cognitive assessment is made by neuropsychological tests such as MMSE, tests which are useful in the screening of memory deficit associated with AD. The MMSE test is a quick test, standardized in the examination of cognitive deficit with a known sensibility of 82% and a specificity of 83% and it envelops cognitive domains such as episodic memory, language, orientation and the building capacity. It is considered that a score lesser than 24 on a scale of 30 maximum points denotes the fact that the assessed patient suffers from a form of cognitive insufficiency.

Neuropsychological testing is useful when the AD diagnosis is suspected, but there are other factors that may be associated with cognitive impairment and that differentiate between different types of dementia (vascular risk factors, depression, family history of dementia or other behavioural abnormalities). Auxiliary neuropsychological testing is useful in diagnosing dementia in the patients where a clinical picture of dementia is suspected.(7)

From a theoretical perspective, the brain of the patients diagnosed with AD shows atrophy in certain regions such as medial temporal lobes and in subcortical regions, at the hippocampus level, compared with the patients of the same age,

in the absence of disease signs. The sensitivity in detecting hippocampus atrophy is about 85% and the specificity is low.(9) However, pathological signs of AD are present with several years before the onset of the illness and are MRI detectable. Vascular risk factors for AD and VaD are similar. There is a strong link between AD and VaD pathology, in both cases, the cognitive functioning being affected.(5) Hypertension is recognized as a risk factor for stroke or VaD, but a series of recent studies also mention it as a risk factor for AD.(7,8)

MATERIAL AND METHODS

We evaluated 161 patients hospitalized with the diagnosis of dementia in the Department of Neurology within the Emergency Hospital of the city of Sibiu, from March 2008 until April 2010 and we correlated the onset of hypertension with the type of dementia. The diagnosis of dementia was established using the DSM IV-TR, NINCDS ADRDA and NINCDS-ADRDA criteria. Each patient was evaluated clinically, neuropsychologically (MMSE, ADAS-cog), imagistically (CT head) in order to establish the diagnosis of dementia.

RESULTS

Out of 161 patients diagnosed with dementia, 43% were diagnosed with AD (69 patients), 27% with VaD (44 patients) and 30% with mixed dementia (48 patients).

The average age was 74.1 for the patients with AD, 76.9 for the patients with VaD and 75.8 for the patients with MD. In the group of patients with AD, 65% were women and 34% were male. In the group of patients with VaD, 44% were women and 46% were male, and in the group of patients with MD, 42% were women and 48% were male.

The medium value of the MMSE scale at the moment of examination was of 20.8 points for the patients diagnosed

¹Corresponding author: Liliana Prodan, Neurologic Clinic Sibiu, County Clinical Hospital Sibiu, 550330, România, e-mail: prodan_liana@yahoo.com, tel +40745060243

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CLINICAL ASPECTS

with AD, 18.9 points for the patients diagnosed with VaD and 19.4 points for the patients diagnosed with MD.

Out of 161 patients, 93 patients (57.8%) had hypertension and in 35 cases (21.8%), the onset of hypertension was at a medium age, which was below 60 years in the current study. We evaluated the relationship between these 161 patients diagnosed with dementia, the type of dementia and hypertension.

Table no. 1. Assessment of the relation between the dementia patients, type of dementia and blood pressure.

	AD	VaD	MD
Hypertensive patients	40,6%	72,1%	68%
Hypertension onset < 60 years old	67,9%	29%	21,2%

In the group of patients with VaD, the percentage of the patients with hypertension was of 72.1%, this being the most important type of analyzed dementia but the percentage of the patients whose hypertension onset was before the age of 60 was of 67.9% in the patients with AD. All patients benefited from medical treatment for hypertension.

Table no. 2. Percentage representation of the patients with anti-hypertensive treatment, according to the type of dementia.

Type of dementia	AD	VaD	MD
% patients with medical treatment for hypertension	97%	95,6%	96,4%

DISCUSSIONS

Hypertension is a risk factor for stroke and vascular dementia; clinical trials have recently demonstrated that there is a link between the onset of hypertension at a medium age and the later development of AD.(10,11)

In our study, 67.9% of the patients with AD had hypertension diagnosed before the age 60. Compared with the percentage of patients with VaD or MD, this percentage is higher and has a significant statistical value ($P < 0.005$).

Honolulu Asia Aging Study has identified a relationship between hypertension present at middle age and the low weight of the brain, but also the increase of the number of "neurofibrillary tangles" at hippocampus level at the autopsy performed in the patients with AD.

An inverse correlation was demonstrated between subsequent cognitive functioning with aging and high blood pressure value.(10)

Also, the Framingham Study showed an inverse correlation between systolic pressure and cognitive performance with aging in the patients with untreated hypertension.(12)

Following the impact of hypertension in the patients with dementia, the authors of a meta-analysis find an increased risk of AD in hypertensive patients in 5 out of 6 cases (relative risk - 4.5, 95% CI 1.5 - 13.1) and in 5 out of 6 studies, they also identify a high risk of dementia in general (relative risk - 4.0, 95% CI 1.6 - 10.3).(13)

It is also quoted that there are differences determined by the action of hypertension, in medium versus advanced age. Most studies highlight that the action of hypertension at a medium age is associated with the risk of developing dementia, particularly AD, compared with the action at an advanced age.(14)

CONCLUSIONS

Hypertension is recognized as a risk factor for stroke and VaD. In this study, the hypertension with an onset before the age of 60 is common in the patients with AD (67.9%

patients), statistically significant compared with the percentage of the patients with an onset of hypertension before the age of 60 and diagnosed with VaD or MD. ($p < 0.005$).

REFERENCES

- Patterson C, Gauthier S, Bergman H et al. The recognition, assessment, and management of dementing disorders: conclusions from the Canadian consensus conference on dementia. *Can J Neurol Sci.* 2001;28:Suppl.1-S3-16.
- Lindsay J, Sykes E, McDowell I et al. More than the epidemiology of Alzheimer disease: contributions of the Canadian Study of Health and Aging. *Can J Psych.* 2004;49:83-91.
- Roman G. Vascular dementia: distinguishing characteristics, treatment and prevention. *JAGS.* 2003;51:S296-304.
- McKhann G, Drachman D, Folstein M et al. Clinical diagnosis of Alzheimer's disease: report of the NINCDS-ADRDA Work Group under the auspices of the Department of Health and Human Task force on Alzheimer disease. *Neurol.* 1984;34:939-44.
- Roman G, Tatemichi TK, Erkinjuntti T, et al. Vascular dementia: diagnostic criteria for research studies. Report of the NINDS-AIREN International Workshop. *Neurol.* 1993;43:250-60.
- Snowdon DA, Greiner LH, Mortimer J et al. Brain infarction and the clinical expression of Alzheimer disease: the Nun Study. *JAMA.* 1997;277:813-17.
- Bowler JV. The concept of vascular cognitive impairment. *J Neurol Sci.* 2002;203-4:11-15.
- Rockwood K. Vascular cognitive impairment and vascular dementia. *J Neurol Sci.* 2002;203:23-7.
- Roman GC. Vascular dementia revisited. Diagnosis, pathogenesis, treatments and prevention. *Med Clin NA.* 2002;86:477-99.
- Hachinski V. Vascular dementia: a radical redefinition. *Dementia.* 1994;5:130-2.
- Wallin A, Milos V, Sjogren M, et al. Classification and subtypes of vascular dementia. *Int Psychoger.* 2003;15:27-37.
- Rockwood K, Davis H, MacKnight C, et al. The consortium to investigate vascular impairment of cognition: methods and first findings. *Can J Neurol Sci.* 2003;30:237-40.
- Launer LJ, Ross GW, Petrovitch H et al. *Neurobiol Aging.* 2000;21:49-55.