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Prevalence of Neurocognitive Changes in Hypertensive Patients of 10 Years of Evolution

Abstract

Introduction: Cognitive impairment and neurological brain injuries area known complication of high blood pressure. We have therefore decided to evaluate the prevalence of neurocognitive impairment in our population of hypertensive Patients using cardia cresonance skull and minimal cognitive assessment test (Mini-mental test).

Objective: Determine the prevalence of cognitive disorders and structural abnormalities in the brain, and their association in hypertensive patients of more often years of diagnosis.

Materials and Methods: Observational, cross-sectional study. The engagement laste done year (August 2012 to August 2013), referred by their cardiologists header. We evaluated patients over 18years of age with a diagnosis of hypertension of ten or more years of Evolution and that have been evaluated through cognitive assessment test (mini mental test) and Magnetic Resonance Skull. Patients with a history of previous stroke or depression diagnosis are excluded. The clinical evaluation included review of the clinical history, recording blood pressure, chronic drug treatment and educational level. In all cases the results of MRI of the brain was recorded. Cognitive status was dichotomized into Impairment present. Impairment absent as a result of the Mini Mental Test. Data is stored in spread sheets Microsoft Excel®.

Results: Nineteen patients were enrolled, with an average age of 65 years (+/- 12.18 years), ranging between 45and 86years old; with a prevalence of 78% female. The only factor associated cardiovascular risk was Dyslipidemia (31% of patients). Thirteen patients (69%) had detectable lesions on MRI. Eight patients (42%) had Mini Mental Test with cognitive impairment present.

Conclusion: The prevalence of cognitive disorders and structural abnormalities in the brain is high in our study population, suggesting that we should consider cognitive disease in all hypertensive patients.

Keywords: Arterial hypertension; Cognitive impairment; Dementia; Cerebral small vessel disease

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Abbreviations: HTAC: Cronic Hypertension; MMT: Mini-Mental Test; NC: Neurocognitive; BP: Blood Pressure; MRI: Magnetic Resonance Image; CI: Cognitive Impairment

Introduction

Cognitive impairment and neurological brain injuries are adreaded complication of chronic Hypertension (HTAC) [1]. Its development generates great disability in the patient's life, as well as another cause of multiple comorbidities, including dementia [2]. The continuon of cerebral vascular-disease comprises varying degrees of impairment in cognitive status, affecting different neurological domains that generated is similar clinical manifestations, such as memory impairment in executive activities, language, among others. These functional changes are grouped under the name of cognitive impairment. The Argentina Federation of Cardiology suggests in his consensusassess the extent of the impairment tests through which question the integrity of the described domains [3].

The pathophysiology that can generate Dementia can be grouped in four types [4,5], in decreasing order of frequency:

a) Dementia Alzheimer type (characterized by degenerative etiology, with amyloid deposits).

b) Vascular (characterized by objetivables neuro resonancia and injuries related to the presence of classical cardiovascular risk factors).

c) Dementia with Lewy bodies.

d) Front o temporal Dementia. The differential diagnosis between them is complex, because most of the time (43%) can be found patho physiological combinations, for example in 26% of patients diagnosed with Alzheimer's vascular alterations can be verified using neuro imaging technics [6]. These data is very important because the evolution of the vascular dementia can be slowed controling the vascular risk factors of the patients [7-9].

Vascular risk factors in particular Hypertension contribute negatively to the stage and prognosis of cognitive impairment and dementia, being verified that the most important variables that influence the degree of neurocognitive (NC) disorder are age and control of blood pressure (BP) of paciente [7-10]. So those who have asystolic blood pressure greater than 160mm Hg have an average relative risk of twice to develop NC impairment tan normo tensive patients.

The prevalence of white matter lesions in hypertension patients varies between 14 and 33% [11,12], finding by MRI various structural types of injuries, among which are described classically the following hypertensive lesions: peri ventricular micro haemorrhages (microbleeds), lacunar infarcts and leukoaraiosis. Many of these are clinically silent, but some times expressed as memory impairment, attention deficit disorders, spatial des orientation and other [13-16]. Therefore we decided to evaluate the prevalence of neurocognitive impairment in a population of hypertensive patients using cardiac Resonance skull and the realization of the minimental test.

Materials and Methods

This is a observational, transversal, study of prevalence. We enrolled patients older than18 years, between the months of August 2012 and August 2013 (1 year), presenting diagnosis of Hypertension of atleast 10 years of evolution and that were evaluated by MRI brain and cognitive assessment using the minimental test of 30 points. Patients with prior diagnosed of Stroke or with depression were excluded. The cognitive level was defined as the result of the minimental test, which divide the population into two groups:

Cognitive impairment present

Less than or equal to 24 points (in patients with complete primary school level) and 26 or less (with complete secondary ortertiary school level)

Cognitive impairment absent

We controled there ports of brain heart resonance 1.5 tesla looking for specific white matter lesions (peri ventricular hyper intense lesions, lacunar infarcts, leukoaraiosis) of each patient, adding to search the presence of cerebral atrophy and microbleeds. The clinical evaluation included review of the general patient clinical history, discriminating the educational level. The controls of blood pressure were performed according the clinical guidelines of the Argentine Hypertension Society (three registers separated by one minute, discarding the first and averaging the last two records). The data were collected in spread sheets of Microsoft Excel, and the prevalence of these alterations was calculated. Statistical analysis was performed with a non parametric Wilcoxon-Mann-Whitney test to determine whether there were statistical significance between the results of the mini-mental test and the normal or pathological results of the brain MRI.

Results

Nineteen patients were recruited over a year, with an average age of 65 years (+/- 12.18 years), ranging between 45 and 86 years old; with a prevalence of 78% female. As the only cardiovascular factor risk associated was found that 31% had been diagnosed with Dyslipidemia (Table 1). 74% of patients received 2 or more drugs to control their blood pressure.

Table 1: Demographics Baseline.

Age (years)	65(+/- 12,18)
Women	15(78%)
Blood pressure average	
Systolic	137(+/-13,08)
Diastolic	81(+/- 7,5)
School level	
Primary completed	9
Secondary completed	10
Cardiovascular Risk Factors associated	
Dislipemic	6(31%)
Amount of antihypertensive drugs used	
1	5(26%)
2	10(52%)
3	4(21%)

Thirteen patients (69%) had detectable lesions on MRI. The described lesions on MRI were: cerebralatrophy (6 patients), cortical hyper intense lesions (5 patients); leuco encephalopathy (4 patients), micro infarcts (4 patients), micro haemorrhages (1 patient), noting that 7 patients presented combination of the above detailed injury. Eight patients (42%) had Mini Mental Test with impaired present (Table 2). Of this 8 patients with altered MMT, 6 had lesions on MRI and 2 evidenced no alterations. Regarding that 11 patients had normal MMT, 7 presented alterations in the RMI skull (Table 3).

Table 2: Results.

MMT Results	
Congnitive Impairment Present	8(42%)
Congnitive Impairment Absent	11(57%)
Craneal RMI Results	
Pathological RMI	13(69%)
Normal RMI	6(31%)
Types of RMI lesions	
Cortical Hyperintensity	5(26%)
Leucoencefalopaty	4(21%)
Microinfractions	4(21%)
Microbleeds	1(5%)
Cerebral atrophy	6(31%)
Combined lesions	7(36%)

Table 3: Results.

	MMT with CI	MMT without CI	Totals
Pathological RMI	6	7	13
Normal RMI	2	4	6
Total	8	11	19

The fourty two percent of the patients had patological MMT (8 patients). The average result of MMT in patients with impaired RMI was 24.53 points, while the average in the patient with normal RMI was 25.33 points. Statistical analysis was performed using a non parametric Wilcoxon-Mann-Whitney no significant differences in the out come of the mini-mental test among people with brain MRI normal or altered (p =0.3284).

Discussion

The brain is considered with the same importance of the rest of target organ damage of the vascular risk factors, with special consideration of cognitive impairment generated by the arterial hypertension. In the population studied we found that atleast one of three hypertensive patients has altered cognitive assessment test. Further more we verified that patients having altered MMT were older (average age 72 years with pathological MMT vs average 59 years with normal MMT). In our population of patients who had an altered magnetic Resonance did not have worse results in the minimental test with respect to those in which no pathology was detected in neuro imaging. Some studies showed the brain injuries begins to appear in the fifth decade [10]. In our sample, 60% of patients under60 years had showed lesions on MRI, but little clinical effect was observed in this age group (1 of the 4 patients had an abnormal MMT). Probably the low cognitive expression of structural pathology in young patients is dueto neuronal plasticity that allows supply anatomical alterations with out having functional impact, there by the structural damage seemto begin earlierthan cognitive impaiment, leaving for future research the relationship between cost and benefit of screening imaging techniques in the evaluation of brain damage in hypertensive patients.

When analyzing the possible biases of this cross-sectional study found that female sex is prevalent (78%), probably related to the size of the selected sample. In addition all patients who entered the study were evaluated by MRI for some previous symptoms, although the presence of increased stroke was discarded, this patients were not completely asymptomatic. Moreover, although the patients had no diagnosis of depression, they were not evaluated with specific tests for disposalat enrollment, since this disease is a confounding factor when performing cognitive tests. It is important to clarify that brain atrophyis not considered a pathognomonic picture of vascular cerebral disease, but it is one of the final forms of this.

Conclusion

This study suggests the high prevalence of vascular-cognitive link with the cronic hypertension, which should be subject to routine clinical study in our offices through basic neuro psychological tolos (simple and rapid test), requiring more extensive studies to define the cost/effectiveness of neuro imaging for the early detection of sub clinical brain damage.

Aknowledgement

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