Angiotensin Receptors Blockers and Cognition in Elderly Home Residents

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Abstract

Background: Cognitive impairment and hypertension are prevalent in elderly. There is controversial data regarding the impact of angiotensin receptor blockers (ARBs) on cognition.

Aim: To study studied the relation between angiotensin receptor blockers (ARBs) and cognition.

Methods: A case control study was conducted among Cairo's elderly home residents, aged ≥ 60 years old, between users (n= 10) and non-users (n= 67) of ARBs among hypertensive elderly in long term care centers.

Results: There was no significant difference between users and non-users of ARBs in MMSE, age, systolic blood pressure (SBP), diastolic blood pressure (DBP) (P= 0.76, 0.54, 0.66 and 0.37 consecutively).

Conclusions: No sufficient evidence supports the relation between ARBs and cognition in a sample of hypertensive elderly.

Keywords: Hypertensive, Cognition,ARBs

Background:

Cognitive impairment is estimated to be 17%–36% of adults aged ≥ 65 years old in the United States[1] and in many cases evolves to dementia.[2]

When elders suffer from cognitive impairment, they are at increased risk of nursing home placement.[3]

Several epidemiological surveys conducted in the USA and Europe conclude that hypertension prevalence in the elderly ranges between 53% and 72%.[4]

Cardio-selective medications such as angiotensin enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs) and beta blockers are considered life-sustaining drugs because they reduce mortality and morbidity.[5-7]

The effects of ARBs on cognition are controversial.[8,9] However, most of the studies were conducted upon patients with heart failure.[10]

Aim of the current study was to assess cognitive functions between users and non-users of ARBs among hypertensive elderly in long term care centers.

Methods

A case control study was conducted among Cairo's elderly home residents, aged ≥ 60 years old, between users (n= 10) and non-users (n= 67) of ARBs among hypertensive elderly in long term care centers.

A Comprehensive Geriatric Assessment was carried out for each participant including full medical history, Clinical examination and assessment of the cognitive status by using the Arabic version7 of the Mini Mental state examination (MMSE). Which is one of the most commonly used global cognitive screening measures because it is quick and easy to administer. The test score is based on 30 total points.[11,12]

Inclusion criteria:

Hypertensive elderly aged ≥ 60 years old.

Exclusion criteria: Patients using ACEIs.

Statistical Analysis

The data were analyzed using Statistical Package for the Social Sciences (SPSS) version 16 (SPSS Inc., Chicago, IL, USA).

Qualitative data were presented in the form of frequency tables. Quantitative data were presented in the form of means and SD or median (interquartile) values. Differences between two groups were assessed using the Student's t-test. For qualitative data, the Chi-square test was used to compare between the two groups.

Results

Seventy seven patients were included. The mean age of the study group was 69.1± 6.2, among participants 13 % were on ARBs (Table 1). There was no significant difference between users and non-users of ARBs in MMSE, age, systolic blood pressure (SBP), diastolic blood pressure (DBP) (P= 0.76, 0.54, 0.66 and 0.37 consecutively)(Table 2).

In addition, there was no difference between users and non-users of ARBs in gender distribution, current smoking status, diabetes mellitus and stroke (P= 0.4, 0.68, 0.3 and 0.35 consecutively)(Table 2).

Table 1: Demography of the study population

Variable	Distribution
Age	69.1± 6.2
Male gender	46 (59.7%)
Diabetes mellitus	25 (32.5%)
Smoker	46 (59.7%)
stroke	14 (18.2%)
Heart failure	8 (10.4%)
MMSE	26.9± 1.9
Systolic blood pressure	128.8± 11.5
Diastolic blood pressure	81± 7.9

Table 2: Comparing between users and non-users of ARBs

Variable	Users	Non-users	P value
Age	68.3± 4	69.2± 6.5	0.54
Male gender	5 (50%	22 (64.7%)	0.4
Current smoking	3 (30%)	8 (23.5%)	0.68
Diabetes mellitus	4 (40%)	8 (23.5%)	0.3
Stroke	1 (8%)	8 (23.5%)	0.35
MMSE	26.8± 1.7	26.9± 1.9	0.76
Systolic blood pressure	127± 14.2	129± 10.9	0.66
Diastolic blood pressure	79± 7.4	81± 7.9	0.37

Using generalized linear method for regression, ARBs were not significant predictor for MMSE , even after adjustment to history of diabetes mellitus, stroke and smoking, , gender, SBP, DBP and age (P= 0.76).

Discussion:

The relation between antihypertensive medications and cognition is still in need for further work as declared by Yasar et al. in a recent review of human studies.[13]

Current data revealed no significant difference between users and non-users of ARBs among hypertensive elderly.

These results are in agreement with Athilingam et al who studied ARBs in patients with heart failure and found that The Montreal Cognitive Assessment total score was not associated with ARBs.[10]

This was not the case Li et al who declared that Angiotensin receptor blockers were associated with a significant reduction in the incidence and progression of Alzheimer's disease and dementia in a predominantly male population.[14]

This discrepancy with the current results may be attributed to the difference in the study population as Li et al studied participants with existing dementia, following their progression and admission to nursing homes.

However, Goh et al in a cohort study found a small reduction in dementia risk with ARBs in comparison to ACEIs. However, the strongest association was seen in early follow-up, suggesting that the inverse association is unlikely to be causal, but instead reflects other important but unmeasured differences between ARBs and ACEIs users.[15]

Similarly, absence of relationship between ARBs use and mitigation of cognitive decline was declared by other authors.[16-18]

ARBs block the actions of Angiotensin II via the AT1 receptor regardless of the biochemical pathway leading to Angiotensin II formation.[19]

This controversy might be explained by the rat model, in which AT_1 receptor blockade increases vascular AT_2 receptor expression and interrupts Angiotensin II negative feedback on renin secretion stimulating the production of Angiotensin II, which is available to act at unblocked AT2 receptors.[20] However, this needs to be further elucidated in human.

Conclusion:

No sufficient evidence supports the relation between ARBs and cognition in a sample of hypertensive elderly.

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