

# Assessment Of Cognitive Impairment Hypertensive's Focusing To Lower The Risk Of Dementia

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DOI: 10.29322/IJSRP.9.12.2019.p9699

<http://dx.doi.org/10.29322/IJSRP.9.12.2019.p9699>

**Abstract-** Background: The Study to assess the risk of cognitive impairment in hypertensive patients in different age groups in various territory hospitals.

Objective: This study is aimed to evaluate risk of cognitive impairment in hypertensive patients. To evaluate the association of characteristics of hypertension, including hypertension status, duration, blood pressure (BP), and pulse pressure (PP), with a cognitive function i.e, executive function, in people aged over 45 years, with a past history of hypertension on medication.

Materials and methods: In this retrospective study conducted at multicenters in Warangal, we randomly collected cases with hypertension with its past history since 5- 25years duration in people over aged 45years. The patient's cognitive function was analysed by using Mini- mental state examination and depression severity was examined by using patient health questionnaire.

Results: In this study, 300 patients were examined lively for cognitive function assessment. Overall hypertensive patients were divided into three age groups middle age(45-60yrs), elderly (61-75yrs) and old elderly (>75yrs) and also divided into 3 categories based on blood pressure ( Controlled BP <140/<90, Treated but uncontrolled BP >140/>90 and Normotensive BP 120/80). These 3 categories were studied comparatively.

Cognitive performance based on mini mental state examination was found to be Severe in **111**patients ( female- 84, Male – 27) in middle age group, **83** patients ( female – 50, male – 33) in elderly and **20** patients (female-13, male- 7) in old elderly age group. Mild cognitive performance was seen in **32** patients (female – 20 and male – 12) in middle age group, **23** patients ( female-5 and male – 18) in elderly age group. Nil cognitive score was seen in **17** patients of middle age and **13** patients of elderly age group. Depression severity based on patient health questionnaire was found to be mild in **12** patients, moderate in **101** patients, moderately severe in **153** patients and severe in **34** patients respectively.

Conclusion: According to our study, history of Hypertension in middle age may lead to cognitive impairment in late life. In the above analysis it was evident that 111 patients (37%) experienced severe cognition impairment in the middle age i.e, (45-60yrs), 83 patients (27%) in elderly (61-75yrs) and 20 patients (6%) in old elderly age group. Depression status was moderately severe in over 50% of the patients.

## I. INTRODUCTION

Hypertension has already been well recognized as a risk factor for cardiovascular and cerebrovascular diseases. Recently, there is an evidence showing that it may also play a role in cognitive dysfunction, increasing risks of related diseases such as Alzheimer's disease (AD) and vascular dementia (VaD). In adults, the hypertensive effects on the brain are thought to be due to systolic blood pressure exceeding the autoregulatory mechanisms of the brain . This results in damage to small cerebral vessels that can lead to impaired autoregulation, lacunar infarcts, amyloid angiopathy, and even cerebral atrophy . In adults, the amyloid angiopathy and cerebral atrophy can look similar to Alzheimer's disease . These changes make it difficult to differentiate HTN that is associated with Alzheimer's disease from vascular dementia secondary to HTN.

Hypertension exerts a more subtle impact on the brain that is revealed by diminished cognitive function. Thus, excluding age, hypertension is the most important risk factor for cerebrovascular pathology leading to stroke and dementia.

Hypertension is a modifiable condition, especially in the early stage, and therefore, it has been hypothesized that antihypertensive treatments might help to prevent early cognitive decline, thus reducing the risk of further neurodegenerative diseases. However, the results on the role that hypertension plays in cognitive decline have been quite inconsistent so far. Several clinical trials failed to draw a conclusion on the effects of controlling blood pressure (BP) on inhibiting cognitive decline due to short study period and low power to detect treatment effects. Numerous epidemiologic studies showed that hypertension in midlife increased the risk of cognitive damage that occurred 20-30 years later, but the outcomes in regards to late-life hypertension were inconsistent. As both AD and VaD have long preclinical phases which are present as mild cognitive decline, a better understanding of the effects of hypertension on cognition in different life stages, especially during and after middle age, is important for preventing both diseases.

The form of hypertension is distinct in middle-aged people (aged 45-59) as compared to in the elderly (aged ≥60). According to Smulyan et al, midlife hypertension is systolic/diastolic hypertension (elevation in both SBP and DBP caused by a raised total peripheral resistance), whereas most of the aged hypertensives present systolic hypertension only (a steady rise in SBP with normal or low DBP due to aortic stiffening). In addition, people over 75 years old tend to have a higher incidence of dementia.

Based on above data, participants in the current study were divided into three groups: middle-aged people (aged 45-59), the young elderly (aged 60-74), and the old elderly (aged  $\geq 75$ ). We aimed to investigate the relationship between hypertension and cognition by comprehensively evaluating the age-dependent effects of hypertension status, duration, and blood pressure on cognitive function based on mini-mental state examination.

## II. METHODOLOGY

### MATERIALS AND METHODS:

- **STUDY SITE :** Mahatma Gandhi Memorial Hospital, Warangal.
- **STUDY TYPE :** Cross sectional study.
- **STUDY PERIOD:** Six months.
- **STUDY CRITERIA:**
- **INCLUSION CRITERIA:**
- Hypertensive patients
- Age above 45
- **EXCLUSION CRITERIA:**
- Memory related diseases like Alzheimer’s disease and Parkinson’s disease.
- Stroke
- Malignant tumours
- Kidney diseases
- Psychiatric problems

### SOURCE OF DATA:

- ✓ Patient data records:
  - Patient demographic details.
  - Past history of hypertension.
  - Medication history.
  - Type of heart disease.
  - Blood pressure.
- ✓ Patient interview for cognitive function assessment using questionnaire in mini- mental state examination (MMSE) and depression severity assessment using patient health questionnaire (PHQ).

### FORMS INCLUDED IN THE STUDY:

- ✓ Data collection form including patient demographic details, blood pressure, Hypertension status, duration, drug therapy, concurrent disease, heart problem, social status.
- ✓ Mini mental state examination
- ✓ Patient health questionnaire for depression severity assessment.

### STUDY PROCEDURE:

1. Subjects with Hypertension are selected based on inclusion and exclusion criteria.
2. Demographic data was collected from patient records.
3. Based on age, hypertensive patients were divided into three groups
  - Group-1 ( middle age) – 45-60 years
  - Group-2 ( elderly) - 61-75years
  - Group-3 ( old elderly) - >75 years.

4. Based on blood pressure 3 groups were categorised i.e, Normotensive (120/80), Controlled Hypertension (<140/<90) and Treated but uncontrolled hypertension (>140/>90).
5. By interviewing patients through mini -mental scale examination, severity of cognitive impairment was analysed.
6. Cognitive impairment was categorised based on scores obtained by each patient into a) mild b) moderate c) severe and d) nil cognitive impairment.
7. By interviewing patients through patient health questionnaire, depression severity was analysed.
8. Depression severity was categorised based on scores into a) minimal, b)mild, c) moderate, d) moderately severe and e) severe.
9. The data collected throughout 6months from 300 patients is analysed.
10. The summarized data was entered in Microsoft Excel.
11. Patients were separated based on age, cognitive impairment severity and depression severity and significance was obtained.

## III. RESULTS AND DISCUSSION:

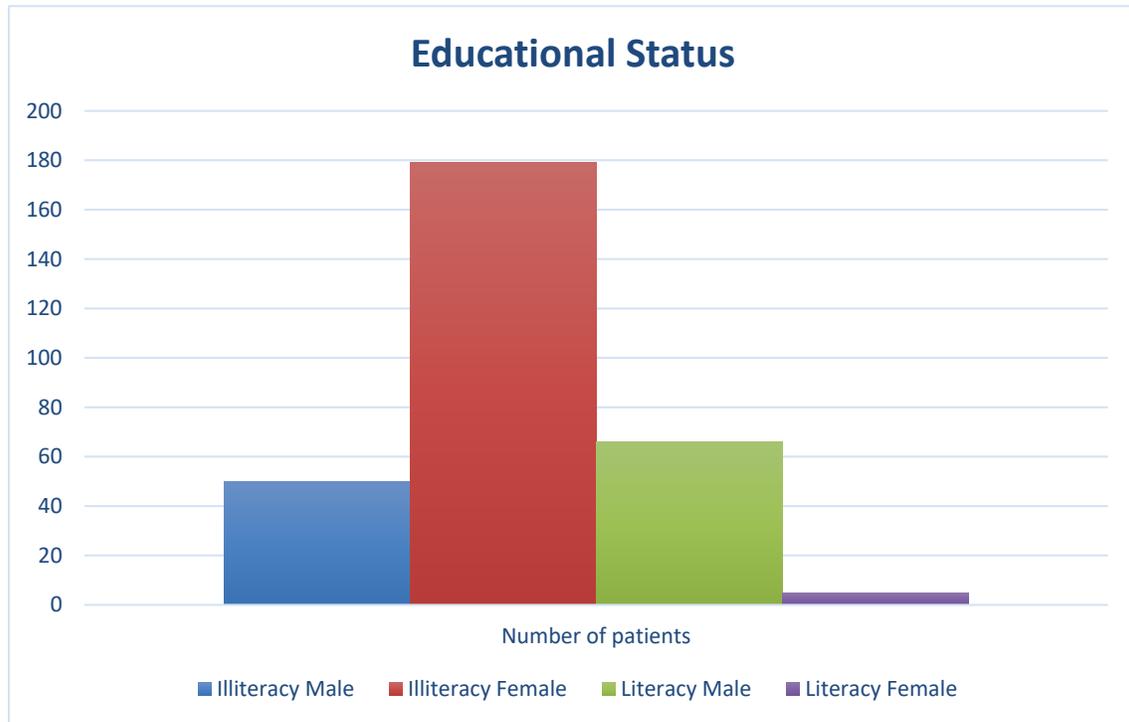
**Table 1: Gender wise distribution**

Gender	Total number of patients
Male	116
Female	184

**Table 2: Age wise distribution:**

Gender	45-60 years	61-75years	>75 years	Total
Male	47	62	7	116
Female	114	57	13	184
				300

**Figure 1 : Educational status**



**Table 3: Hypertension status**

HTN status	Male	Female	Total	Percentage
Controlled	66	106	172	57.3%
Treated but uncontrolled	48	77	125	41.6%
Normotensive	2	1	3	1%

**Table 4: History of Hypertension duration**

Duration	Number of patients
0-5	54
6-10	168
11-15	63
16-20	10
21-25	05

**Table 5: List of concurrent diseases.**

Disease	Number of patients
Coronary artery disease	94
Hypertension	53
Angina	53
Left ventricular dysfunction	25
Systolic Hypertension	09
Congestive Cardiac Failure	08
Systemic Hypertension	07
Systemic Hypertension with diabetes	04
Angioplasty	04
Others	34

**Table 6: ANTIHYPERTENSIVE DRUGS**

DRUGS	No of patients
Telmisartan	103
Atorvastatin	29
Enalapril	29
Amlodipine	22
Atenolol	17
Carvedilol	06
Losartan	02
Metoprolol	01
Olmesartan	01
Clinidipine	01

Figure 2: Depression Severity

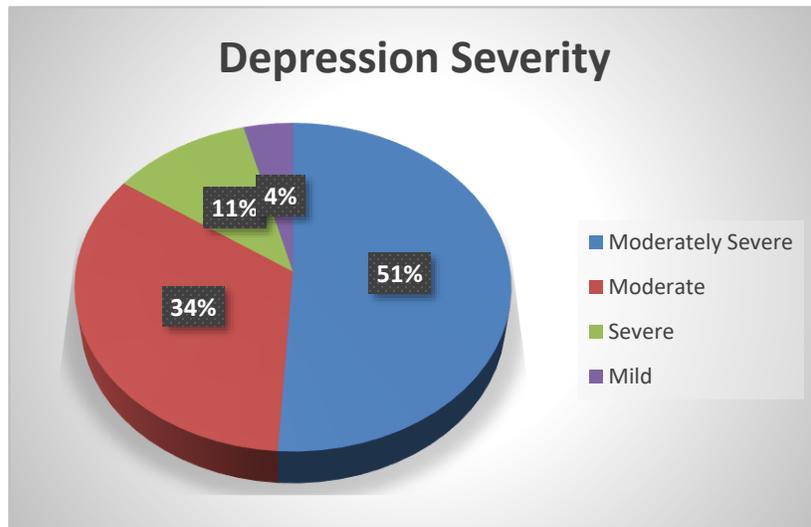
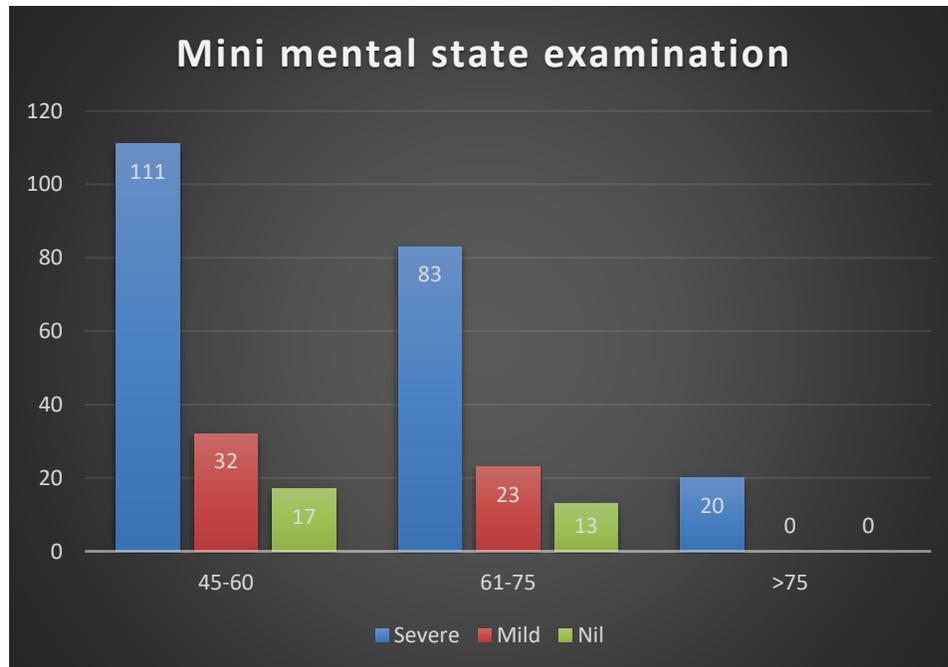


Table 7 : Mini mental scale examination (cognitive impairment)

Age (years)	Severe	Mild	Nil
45-60	32	17	111
61-75	23	13	83
>75	0	0	20

**Figure 3: Mini mental state examination**



#### IV. DISCUSSION:

- In our hospital based study, data was collected from 300 patients.
- Demographic analysis of this retrospective study revealed that out of 300 patients:
- **116 (38.66%)** were males and **184 (61.33%)** were females.
- **192(64%)** belong to rural areas and **108(36%)** belong to non-rural areas.
- All hypertensive patients were divided into 3 categories based on age i.e, middle age (**45-60**) **53.66%**, elderly (**61-75**) **39.66%**, and old elderly (**>75**) **6.66%**.
- Based on blood pressure, patients were divided into
- Controlled hypertension ( **<140/<90 – 172 [57.3%]** ),
- Treated but uncontrolled hypertension ( **>140/>90 – 125 [41.6%]** ) and
- Normotensive ( **120/80 – 3 [1%]** ).
- Overall, **Severe** cognitive impairment was seen in **111(37%)** patients of middle age and **83(27.6%)** patients of elderly age group.
- Depression was found to be severe in **34(11.3%)**, moderately severe in **153(51%)**, moderate in **101(33.6%)** and mild in **12(4%)**.
- Among all hypertensive patients, **94(31.5%)** were diagnosed with coronary artery disease and 53(17.6%) have only hypertension history.
- Telmisartan is being used by 103(34.3%). Atorvastatin in 29(9.6%), Enalapril in 29(9.6%). Two and three multiple anti- hypertensive drugs were prescribed in **24(8%)** and **7 (2.3%)** respectively.

- The outcomes of the study revealed that middle aged hypertensives also experience severe cognition impairment in which females contribute to high percentage. Coronary artery disease is the main concurrent disease along with hypertension which may increase the risk of dementia.

#### V. CONCLUSION:

The results of present study shows that people aged 45-60 years are compensated by the cognitive deficits brought by hypertension. Treated but uncontrolled hypertension and systolic blood pressure may be risk factors for the cognitive decline in people aged 60-75 years. Untreated, treated but uncontrolled and increased pulse pressure may predict cognitive degeneration in people aged >75 years. Females are more prone to Hypertension than males. Illiteracy is likely to be associated with poor health status and self reported chronic morbidity. Midlife hypertension more likely better reflects the long term effect and duration of hypertension effect on brain.

According to our study, history of Hypertension in middle age may lead to cognitive impairment in late life. In the above analysis it was evident that 111 patients (37%) experienced severe cognition impairment in the middle age i.e, (45-60yrs), 83 patients (27%) in elderly (61-75yrs) and 20 patients (6%) in old elderly

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