

ASSESSMENT OF COGNITIVE DYSFUNCTIONS IN ESSENTIAL HYPERTENSIVES- A CROSS-SECTIONAL STUDY

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ABSTRACT

BACKGROUND

Arterial hypertension and blood pressure level are associated with cognitive impairment. Susceptible people, especially cerebral ischaemia are having more severe cognitive impairment. Elevated blood pressure for long term contributes to cognitive impairment in later life.

The aim of this study is to determine the cognitive dysfunctions in essential hypertensives.

MATERIALS AND METHODS

It was a descriptive cross-sectional study that was conducted among 300 subjects who were diagnosed as essential hypertensives were chosen by simple random sampling from the inpatient and outpatient facility of Department of Medicine, Father Muller's Medical College. The socio-demographic data of hypertensives was collected on a semi-structured proforma. Patients were assessed for cognitive dysfunctions using the Standardised Mini Mental Status Examination (SMMSE) and Brief Cognitive Rating Scale (BCRS). Data was analysed using SPSS 18 software.

RESULTS

Mean age group of patients was 51.67 years, majority of the patients were males and were urban domicile. Majority of patients had primary level of education. Majority of patients had positive relation between cognitive deficiency and their hypertensive status was measured using Standardised Mini Mental Status Examination (SMMSE) and Brief Cognitive Rating Scale (BCRS).

CONCLUSION

The study showed that there are significant cognitive deficits in hypertensives. SMMSE (Standardised Mini Mental Status Examination) and BCRS (Brief Cognitive Rating) Scales were used to measure Cognitive deficits, which were very closely related to hypertension.

KEYWORDS

Hypertension, Cognitive Dysfunction.

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BACKGROUND

Arterial hypertension and blood pressure level are associated with modestly accelerated cognitive decline during the adult life span and with moderately increased risk of poor cognitive performance at all ages.¹ Evidence presented suggests that raised blood pressure levels contribute to cognitive impairment in susceptible people, (especially in concomitant conditions which predispose to cerebral ischaemia).^{2,3} The incidence and severity of cognitive impairment and dementia strongly increase with age. The decline in cognitive function may be intrinsic to aging itself.⁴

Cognitive impairment or an acquired deficit in memory function, problem solving, orientation and abstraction,

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diminishes an individual's capacity to function independently.⁵ Declining cognitive function and cerebrovascular diseases are both common in old people. Elevated blood pressure (BP) contributes to cognitive impairment in old age. Long term cognitive effects of BP level are important, because BP is potentially modifiable through behavioural or pharmaceutical means. Increased levels of untreated BP predicted poor cognitive function 20 years later.⁶ Many longitudinal studies suggest that hypertension in midlife is associated with cognitive impairment in later life, but there is still lack of evidence to completely understand the relation. So an attempt was made through this study to know the relation between essential hypertension and cognitive deficiency in essential hypertensives.

Aims and Objectives

To determine the cognitive dysfunctions in essential hypertensives.



MATERIALS AND METHODS

A. Source of Data- Subjects for the study were selected from the inpatient and outpatient facility of Department of General Medicine, Father Muller’s Medical College, Mangalore. It was a descriptive cross-sectional study that was conducted during the study period from November 2003 to January 2005. Ethical clearance for conducting the study was obtained from Institutional Review Board.

B. Method of Collection of Data

Sampling Technique- 300 subjects who were diagnosed as essential hypertensives were chosen by simple random sampling from the inpatient and outpatient facility of Department of Medicine, Father Muller’s Medical College.

Sampling Procedure- Initial contact was made in the General Medicine Department of the Hospital. The essential hypertensives were identified. An informed consent was obtained from those who were willing to participate in the study and was recruited for the study.

Data Collection and Analysis- The socio-demographic data of hypertensives was collected on a semi-structured proforma. Patients were assessed for cognitive dysfunctions using the Standardised Mini Mental Status Examination (SMMSE) and Brief Cognitive Rating Scale (BCRS). Using the data collected master chart was prepared and later using SPSS 18 software data was analysed using descriptive statistics and represented in the form of the tables.

Inclusion Criteria

1. Age 30 - 60 years.
2. Essential hypertensive patients with either Systolic Blood Pressure (SBP) more than 140 mmHg and/or Diastolic Blood Pressure (DBP) more than 90 mmHg.
3. Essential hypertension must be a minimum of one month’s duration.

Exclusion Criteria

1. Essential hypertensive patients aged more than 60 years.
2. Patients having any psychiatric disorders, dementias, alcohol and drug abuse.
3. Patients with multiple chronic diseases causing cognitive impairment like neurodegenerative diseases, thyroid and adrenal disorders, renal disorders, cancers and stroke.

RESULTS

A total of 300 hypertensive subjects were taken for the study, assessed and analysed.

The demographic detail of the population is represented in Table 1.

Sl. No.	Characteristics	
1.	Age group in years (%)	30 - 40 - 60 (20%) 41 - 50 - 95 (31.6%) 51 - 60 - 145 (48.3%)
2.	Sex (%)	Male - 210 (70%) Female- 90 (30%)
3.	Education (%)	Primary- 180 (60.0%) Middle- 80 (26.7%) Secondary- 30 (10%) Hr. Secondary- 10 (2.3%)
4.	Domicile (%)	Rural- 60 (20%) Urban- 240 (80%)
5.	Religion (%)	Hindu- 120 (40%) Muslim- 120 (40%) Christian- 60 (20%)

Table 1. Demographic Details of Study Subjects

The blood pressure profile of the study subjects is represented in Table 2.

Sl. No.	Characteristics	N	Mean	SD
1.	Systolic Blood Pressure	300	166.67	15.16
2.	Diastolic Blood Pressure	300	104.66	10.08

Table 2. Blood Pressure Profile of Study Subjects

The Standardised Mini Mental Status Examination (SMMSE) profile of the patients is represented in Table 3.

Sl. No.	Characteristics	N	Mean	SD
1.	Orientation Individual Scoring	300	9.07	1.11
2.	Registration Individual Scoring a. Score 3.00	300	-	-
3.	Attention Individual Scoring a. Score 5.00	300	-	-
4.	Recall Individual Scoring a. Score 1.00 b. Score 2.00 c. Score 3.00	10 20 270	-	-
5.	Language Individual Scoring a. Score 8.00	300	-	-
6.	Construction Individual Scoring a. Score 0.00 b. Score 1.00	230 70	-	-
7.	Total Score Data	300	28.20	1.40

Table 3. SMMSE Scoring Profile of the Patients

Brief Cognitive Rating Scale (BCRS) profile of the patients is represented in Table 4.

Sl. No.	Characteristics	N	Mean	SD
1.	Concentration Individual Scoring	300	1.86	1.33
2.	Recent Memory Individual Scoring			
	a. Score 1.00	260	-	-
	b. Score 2.00	20		
3.	Past Memory Individual Scoring			
	a. Score 1.00	260	-	-
	b. Score 2.00	10		
4.	Orientation Individual Scoring			
	a. Score 1.00	300	-	-
5.	Functioning and Self-Care Individual Scoring			
	a. Score 1.00	280	-	-
	b. Score 2.00	20		
6.	Total Score Data	300	1.26	0.45

Table 4. BCRS Scoring Profile of the Patients

DISCUSSION

This study shows that there are significant cognitive deficits in hypertensives. In this study, more of hypertensives who had cognitive dysfunction were in their mean age of 51 years. This was comparable with the results noted in the earlier studies where their mean age was more than 56 years and advanced age.^{7,8}

In this study, the hypertensives who had cognitive dysfunction were of male sex. This was comparable with the results in the earlier studies.⁷

In this study there were significant number of cases of Muslims having cognitive dysfunctions, where previous studies have studied particularly biracial community who had curvilinear association with cognitive performance.⁸ In accordance with previous studies, cognitive dysfunction is also higher in people with low level of education or illiterates. In terms of associated risk factors and comorbidities such as hypertension were the main risk factors for cognitive dysfunction.

In this study, cognitive dysfunction were more in hypertensives who were urban domiciled. The results noticed in the present study was not comparable with the previous study, which concluded as rural residents having more cognitive dysfunctions. The probable reasons for having more cognitive dysfunction cases in urban domicile in our study may be due to changes in lifestyle habits leading to stress, which in turn may result in hypertension which leads to cognitive dysfunction.

In this study, hypertensive group who have cognitive dysfunction were educated upto primary school, i.e. 5th Std.

This was comparable with results noticed in earlier studies where less or lower education was noticed.⁹ The results noticed in the present study was not comparable with one study, where it mentions 8 years or less of education.¹⁰

In this study the mean duration of hypertension was 4.3 years, which has very highly significance for any cognitive dysfunctions. This was comparable with the results noticed in the earlier studies of 4 years duration.^{11,12} The results which were not comparable with other previous studies are 5 years duration¹³ and 6 years duration.

In this study, the mean systolic blood pressure was 166 mmHg in cases who had cognitive dysfunctions, which was statistically very highly significant. This was comparable with the results noticed in previous studies, where the systolic blood pressure (more than 160 mmHg) are at the risk of cognitive impairment.¹⁴

In this study, the SMMSE scale was used to find out cognitive dysfunctions. It was found that cognitive domains like orientation, recall and construction was statistically very highly significant in hypertensives. This was comparable with the results noticed for cognitive domain of orientation in a previous study and not comparable with other study.¹⁵ This was comparable with the results noticed in cognitive domain for recall in many previous studies.^{16,17} This was comparable with the results noticed in cognitive domain of construction in a study.¹⁸ In this study the SMMSE scale used to find out cognitive dysfunctions like registration, attention and language functions did show statistically significant. This is comparable with the results noticed in many previous studies on cognitive domain for registration.^{16,8,17,18} This was not comparable with the results noticed in many of the previous studies done on cognitive domain like attention,¹⁶ and it was comparable with the study.¹⁹ This was comparable with the results noticed in a previous study done on cognitive domain like language function.⁹

In this study, BCRS scale was used to study the cognitive dysfunction in the cases. It showed the results in the cases that the cognitive domains like concentration to be statistically very highly significant. This was either not comparable or comparable with the results noticed in all previous studies done on cognitive domain for concentration. In this study the BCRS scale used to study cognitive dysfunctions in cases showed that the cognitive domains like recent memory, past memory, orientation, functioning and self-care was statistically not significant. This was comparable with the results noticed in many previous studies on cognitive domains of recent memory and past memory,¹³ but was not comparable with many of the previous studies.^{16,20} On the cognitive domain for orientation, this was comparable with a previous study and was not comparable with another study.²¹ This was comparable with the results noticed in study on cognitive dysfunction of functioning and self-care,¹³ but was not comparable with other studies done previously.^{21,17}

CONCLUSION

- a. The study showed that there are significant cognitive deficits in hypertensives.

- b. SMMSE (Standardised Mini Mental Status Examination) and BCRS (Brief Cognitive Rating) Scales were used to measure cognitive deficits were very closely related to hypertension.

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