

Assessment of Risk Factors of Hypertension in Geriatric Patients



Medical Science

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Dr Rajat Arora

DNB (Family Medicine) Resident, Indira Gandhi Government general Hospital and Post Graduate Institute, Puducherry (IGGGH & PGI).

Dr Swati Duggal

MD (Microbiology) Resident, Dr S.N. Medical College, Jodhpur (Rajasthan)

Dr. MJ Stanley Ambrose

M.D., Specialist Grade I General Medicine, Department of Medicine, IGGGH & PGI.

Dr. S. Anandaraja

D.M.(Cardiology), Specialist in Cardiology, Department of Cardiology, IGGGH & PGI.

ABSTRACT

Introduction: Hypertension is a global public health issue because of its high frequency and leading cause of mortality due to noncommunicable diseases worldwide.

Materials and Methods: This is a prospective study conducted in Geriatric wards of Indira Gandhi Government General Hospital & Post Graduate Institute, Puducherry, India over a period of one year to assess various risk factors development of hypertension.

Results and Discussions: 122 patients out of 191 admitted in geriatric wards suffered from hypertension with a prevalence of 63.87% and mean age as 68.65±7.36 years. The risk factors of hypertension studied were dyslipidemia(77.90%), obesity(44.30%), diabetes mellitus(37.70%), smoking(27.00%) and alcohol(32.80%).

Conclusion: Early and regular screening of hypertension with lifestyle modifications and regular exercise is required in all elderly patients.

INTRODUCTION

Hypertension is a global public health challenge as it is one of the most common chronic noncommunicable diseases accounting for significant morbidity and mortality. The worldwide increase in the elderly population (age 60 years and above) is associated with concurrent increase in prevalence of systemic hypertension and associated target organ damage due to vascular complications of hypertensive disease.

Hypertension with associated multiple co-morbid conditions and risk factors increases the chances of development of target organ damage. Age, sex, race, smoking, alcohol, diabetes mellitus, dyslipidemia and obesity all may alter the prognosis of hypertensive vascular disease.

Increase in blood pressure with age is mostly related to changes in arterial and arteriolar stiffness. Arterial stiffness results from structural and functional changes to the ageing vasculature, including arterial wall thickening, smooth muscle cell hypertrophy, inflammation, nitric oxide deficiency, and fragmentation of elastin. These changes occur mainly as a consequence of volume expansion, activation of the renin-angiotensin-aldosterone system, activation of the sympathetic nervous system, and endothelial dysfunction.¹

Dyslipidemia is an important factor for atherogenesis, which commonly occurs in concordance with hypertension and leads to development of target organ damage. Obesity leads to changes in the structure of the heart, blood vessels, and the kidneys and may adversely affect cardiovascular and renal morbidity and mortality more aggressively in older individuals.² Smoking increases vascular damage by increasing sympathetic tone, platelet aggregation and reactivity, free radical production, damage to endothelium, and surges in arterial pressure. The prevalence of type 2 diabetes in India is increasing at a very fast pace and this is likely to contribute to a significant burden of hypertension. Alcohol consumption of more than 2 alcoholic drinks per day is strongly associated with BP elevations. Therefore, the present study was conducted to assess the prevalence of various risk factors on hypertension among elderly population.

MATERIALS AND METHODS

A prospective study was conducted in 191 patients in Geriatric wards of Indira Gandhi Government General Hospital & Post

Graduate Institute, Puducherry, India over a period of one year (January 2014 to December 2014) for assessment of various risk factors of hypertension in elderly patients. All elderly (60 years or above) patients admitted in male and female geriatric wards, for various ailments were consecutively enrolled in the study with a signed informed consent. However, patients with severe debility, terminal malignancies and chronic infections or any conditions which limit patient's cooperation were excluded from the study.

A detailed study was elicited and a complete meticulous physical examination was done including vitals, anthropometric measurements (Height and weight), general and systemic examination. Height was measured with a tape to the nearest centimeter. Subjects were requested to stand upright without shoes with their back against the wall, heels together and eyes directed forward. Weight was measured with a traditional spring balance that was kept on a firm horizontal surface. Subjects were asked to wear light clothing and weight was recorded to the nearest 0.5 kg. Body mass index (BMI) was calculated using the formula: weight(Kg)/height² (m)². BMI of equal to or more than 25 was regarded as Obese.

Each participant's Blood pressure was measured in supine, sitting and standing posture. Classification of hypertension was done according to IGH - III guidelines. A standard mercury sphygmomanometer (Diamond Co.) was used for recording blood pressure. Before the measurement was taken, the subject was seated comfortably for at least 5 min. Care was taken that arm muscles were relaxed and the arm was supported at heart level. The cuff was applied evenly to the upper arm and was rapidly inflated until the manometer reading was 30 mmHg above the level at which the radial pulse disappears, and then slowly deflated at the rate of approximately 2 mmHg/second. During this time, the Korotkoff sounds were monitored using a stethoscope placed over the brachial artery. The first (appearance) and the fifth (disappearance) Korotkoff sounds were recorded as indicative of SBP and DBP, respectively. Systolic and diastolic blood pressures were measured twice in each sitting/ supine and standing position.

Blood was tested for fasting blood sugar and fasting lipid profile (including total cholesterol, high density lipid, low density lipid, triglycerides). The patient was considered diabetic if fasting

blood glucose is ≥ 126 mg/dL and dyslipidemia if total cholesterol > 200 mg/dl or High Density Lipid < 40 mg/dl or Low Density Lipid ≥ 130 mg/dl or triglycerides ≥ 200 mg/dl. History of alcohol intake and smoking was also elicited to signify its association with hypertension.

Data was analyzed using professional statistics package EPI Info 7.0 version for Windows. Values of $p = < 0.05$ was considered statistically significant.

RESULTS & DISCUSSION

In our study, 122 elderly patients (60 years or above) had hypertension, out of a total of 191 patients, admitted for various ailments in the geriatric wards. Overall prevalence of hypertension was 63.87% with females (n=71) being affected more than males (n=51)(Table 1).

	Hypertension		No Hypertension		Total
	Frequency	Percentage	Frequency	Percentage	
Male	51	59.30%	35	40.68%	86
Female	71	67.61%	34	32.38%	105
Total	122	63.87%	69	36.21%	191

Table 1 : Prevalence of hypertension in elderly

Similar to our study, **Biswas D et al³** and **Radhakrishnan S et al⁴** showed the prevalence of hypertension as 64% and 59% respectively in their studies in geriatric patients. In a study of hypertension in elderly in an urban slum of Bangalore city, **Srikanth J et al⁵** observed that out of 96 hypertensive patients, 33.30% were males and 66.70% were females. **Kramoh K et al⁶** observed that 59% females and 41% males were suffering from hypertension in their study of hypertension in the elderly.

Mean age of hypertension was 68.65 ± 7.36 years with mean systolic blood pressure and diastolic blood pressure as 173.28 ± 23.70 mm Hg and 87.57 ± 18.35 mm Hg respectively. **Hazarika N et al⁷** also documented that mean systolic blood pressure was 150.52 ± 1.71 mm Hg and mean diastolic blood pressure was 88.22 ± 0.83 mm Hg in their study.

Mean values of total cholesterol, high density lipid, low density lipid and triglyceride were 181.94 ± 21.443 , 37.03 ± 5.341 , 99.77 ± 19.693 , 143.87 ± 22.643 and mean BMI of the study population was 24.80 ± 3.826 . More than three fourth of the elderly hypertensive patients had dyslipidemia (77.90%). It was the most common associated co-morbid condition (Table 2).

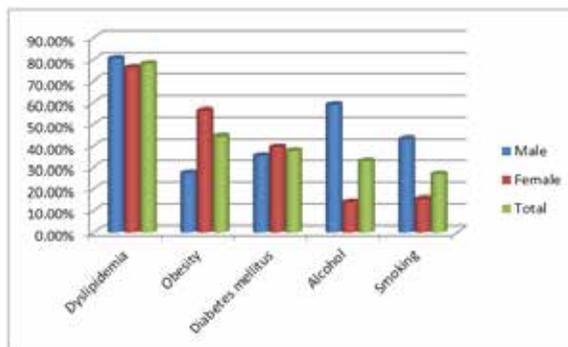
Co-morbid conditions	Male		Female		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Dyslipidemia	41	80.40%	54	76.10%	95	77.90%
Obesity	14	27.50%	40	56.30%	54	44.30%
Diabetes mellitus	18	35.29%	28	39.44%	46	37.70%
Alcohol	30	58.82%	10	14.08%	40	32.80%

Table 2 : Distribution of risk factors among both sexes

Sawant A et al⁸ found out that nearly 80% of the subjects had at least one abnormal lipid parameter.

In our study more than half of the female (56.30%) elderly patients had body mass index (BMI) ≥ 25 . Obesity was more preva-

lent among female ($p = 0.002$). **Yadav S et al⁹** obtained a mean BMI of 27.1 ± 4.4 (Graph 1).



Graph 1 : Distribution of risk factors among both sexes

Total prevalence of obesity in the study population was 44.30%. **Singh A et al¹⁰** obtained prevalence of obesity as 60.7% in their study to assess the prevalence of hypertension and its risk factors among urban Sikh population of Amritsar. The above differences in prevalence of obesity can be attributed to varying dietary patterns in the study populations.

Diabetes mellitus was present in 37.70% of patients. **Dwivedi S et al¹¹** observed diabetes mellitus as an important clinical condition in 31.41% of elderly hypertensive patients. Hypertension is well recognized as an insulin resistant state.⁹⁶ Almost 30% to 35% of hypertensive patients are detected to have co-existing diabetes mellitus. Similarly, the prevalence of hypertension is 1.5 to 2 times greater in patients with diabetes mellitus as compared to non-diabetics subjects.¹⁰⁹

In our study, 32.8% of the patients were alcoholics and only 27% were smokers. Both smoking and alcohol were more prevalent among men ($p = 0.0001$). **Hazarika N et al** found a direct association between alcohol consumption and increase in blood pressure in a rural population of Assam whereas **Kulkarni V et al¹²** observed that smoking as important determinant of hypertension in elderly.

We observed that obesity was more prevalent among females whereas smoking and alcoholism was more prevalent among males.

CONCLUSION

Early and regular screening of risk factors for hypertension should be done in all elderly people as prolonged untreated hypertension increases the risk of vascular damage and involves the major organ systems like cardiovascular system, central nervous system, retina, kidneys and peripheral arteries leading to target organ damage. In the management of hypertensives, lifestyle modifications have to be more aggressive. Lifestyle measures include weight loss in case of obese, dietary changes like low salt, low sugar and low fat and regular exercises.

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