



**Research Article**

**CLINICAL PROFILE OF 50 CASES OF ELDERLY (AGE 65 Yrs.), LONG STANDING (Duration>10 Yrs.) HTN WITH SPECIAL REFERENCE TO FUNDUS & 2D ECHO FINDINGS**

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**ABSTRACT**

The 20<sup>th</sup> century has seen an unparalleled increase in life expectancy worldwide and as a consequence, there has been a major shift in the etiology of illness, morbidity and mortality throughout the world. With such a significant effect on morbidity and mortality in the elderly, hypertension continues to remain a major medical challenge. Lander Brunton in 1909 and Janeway in 1915 established 150 mm of Hg systolic blood pressure as the upper limit for elderly in the present study of clinical profile of elderly with long standing hypertension with special reference to fundus and 2D Echocardiography findings. The most common age group affected with hypertension in elderly was 65-74 years with greater prevalence in females.

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**INTRODUCTION**

The 20<sup>th</sup> century has seen an unparalleled increase in life expectancy worldwide and as a consequence, there has been a major shift in the etiology of illness, morbidity and mortality throughout the world.

The proportion of elderly population (aged 60 years and above) is rising steadily. In India, their percentage share is projected to increase from 10% in 2000 to 12% in 2030 and 20% in 2050<sup>1</sup>, while worldwide; it is increasing at the rate of 3.5% per year, considerably faster than the increase in the overall global population<sup>2</sup>. With this alteration, we are, at present, in the age of Delayed Degenerative Diseases that plaque the aged. Hypertension is a disease that affects 35% of the geriatric population all over the world. Cardiovascular disease, the most common cause of death, and cerebrovascular disease, the 3<sup>rd</sup> most common cause, together comprise 50% of deaths worldwide<sup>4</sup>. Amongst them, 25% of coronary artery disease and 58% of stroke mortality is directly attributed to Hypertension.<sup>3</sup>

The cardiovascular risk doubles when blood pressure increases by as little as 30/20 mmHg<sup>4</sup> and lowering the systolic blood pressure by merely 15mmHg decrease cardiovascular mortality by a third<sup>4</sup>. In spite of this, only 35% hypertensive patients worldwide have their blood pressure under control<sup>3</sup>. With such a significant effect on morbidity and mortality in the elderly, hypertension continues to remain a major medical challenge. Hence, the present study was undertaken to study and evaluate the demographic profile of elderly patients with long standing

hypertension, the various risk factors, presenting signs and symptoms and complications ascribed to it with special consideration to analyze its long-term effect on cardiac and ophthalmic function.

**Aims and Objectives**

To study the effects of isolated systolic hypertension in the elderly. To study the incidence of various complications in elderly Hypertensive. To correlate the severity of hypertension and its complications. To evaluate the role of various risk factors which contribute to the complications occurring in these patients. To analyze 2D echocardiographic findings in the study population. To review the fundoscopic changes due to long standing hypertension.

**REVIEW OF LITERATURE**

Measurement of arterial pressure dates back to the 18<sup>th</sup> century with the elemental instruments designed by Riva- Rocci in 1886 and Hall & Bernard in 1897. Von Recklinghausen subsequently improved on it. In 1905, Korotk off described sounds in the sphygmomanometer associated with a pulse wave that provided the fundamentals for the current day modality for blood pressure measurement.

Lander Brunton in 1909 and Janeway in 1915 established 150 mm of Hg systolic blood pressure as the upper limit for elderly. Keil (1923) showed that there is a substantial rise of blood pressure with age. Richard Bright (1928) gave the chemical theory for hypertension, which stated that it is caused by altered quality of blood. Wilsons and Byron in 1942 gave the hypothesis regarding reno-vascular hypertension. Master & Peek (1944) showed that incidence of higher blood pressure increases as age increases. In 1951, Pickering observed wide

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pulse pressure in older age group. The cumulative efforts of these scientists have provided the basis of our knowledge of hypertension.

Classification-Hypertension-Essential Hypertension (95%), Secondary hypertension (5%)-Chronic Kidney Disease, Reno vascular hypertension, Obstructive uropathy, Coarctation of aorta, Cushin's Syndrome, Glucocorticoid excess including chronic steroid therapy, Primary hyperaldosteronism and other mineralocorticoid excess states, Pheochromocytoma, Thyroid & parathyroid disease, Sleep apnea syndrome.

Determinants of Hypertension-Cardiac output & total peripheral resistance the generation of hydrostatic pressure in arterial system (Blood Pressure) is a result of two processes-Cardiac output pumping of blood from heart into arteries, total peripheral resistance: Resistance against blood flow through vascular system. Renin angiotensin system (RAS) it is an important endocrine system that affects the control of blood pressure mainly in patients with reno-vascular hypertension-Glomerular hypo perfusion, salt diuresis/salt depletion, B adrenergic stimulation, Endothelial Dysfunction, It has been implicated in essential hypertension. It plays a role in cardiovascular regulation by producing a number of potent local vasoactive agents including vasodilator molecule nitric oxide (NO) and vasoconstrictor peptide endothelia. Vasoactive substances, Vasoactive system and the mechanisms affecting sodium transport and vascular tone are involved in the maintenance of normal blood pressure. Bradykinin, potent vasodilator, Endothelin Powerful vascular constrictor produced from endothelium. It leads to salt sensitive rise in blood pressure and it also activates rennin angiotensin system. Autonomic Nervous system- It is important in the mediation of short term changes in blood pressure in response to stress and physical exercise. Role of sympathetic nervous system in hypertension is important because drugs that block sympathetic nervous system lower the blood pressure and have a well-established therapeutic role. Genetic factors-Multiple genes contribute to the development of hypertension. It is difficult to determine the relative contributions of each of these genes. Evidence suggests that hypertension is about twice more common in cases that have either or both hypertensive parents. Family studies with control for a common environment indicate that blood pressure heritability is in the range 15-35%. In twin studies, heritability estimates of blood pressure are 60% for males and 30-40% for females.<sup>4</sup> Over weight and Obesity, A direct correlation between body fat and blood pressure is firmly established and symmetrically identified in different populationws<sup>35</sup> Hypertension with obesity, increased insulin resistance and dyslipidemia constitutes metabolic syndrome. At present, 25% of the U.S. population is affected by metabolic syndrome<sup>1</sup>.

### Staging of Hypertension

The JNC-7 (Joint National Committee-7)<sup>5</sup> Classification of blood pressure for adults>18 years based on the average of two or more properly measured blood pressure readings on each of the two or more office visits is as follows:-

Blood pressure classification	SBP (mm of Hg)	And	DBP (mm of Hg)
Normal	<120	And	<80
Pre-Hypertension	120-139	Or	80-89
Stage I Hypertension	140-159	Or	90-99
Stage II Hypertension	≥160	Or	≥100

In JNC 8, the definitions of prehypertension and hypertension are note addressed; instead the thresholds for pharmacological treatment are given.<sup>6</sup>

Renal damage & Hypertension-Pre-glomerular arteriolar disease (arteriosclerosis) and tubule-interstitial changes are present in 98% of patients with hypertension. Hypertensive nephrosclerosis is a common cause of end stage renal disease (ESRD). Hypertension and associated abnormalities in rennin-angiotensin system contribute to the rate of progression of renal disease. Most likely sequence is loss of renal auto-regulation, which normally attenuates the transmission of increased systemic pressure to glomeruli leading to glomerulosclerosis and progressive renal dysfunction.

First line drugs-The three first-line drug classes for treating hypertension are (1) a CCB, (2) an ACEI or ARB, and (3) a thiazide. Amlodipine is recommended as the preferred CCB for most patients because it is long acting (once-daily dosing), is the best studied of the CCBs and performed well in multiple RCTs. The choice of an ACEI or ARB involves consideration of cost and tolerability. We recommend a long-acting ACEI or ARB for once-daily dosing. For diuretic therapy, the evidence overwhelmingly favors chlorthalidone (12.5 to 25mg/day) over HCTZ. Lower doses of chlorthalidone (e.g., 6.25 to 12.5mg) may minimize side effects, but doses below 12.5mg have undergone limited evaluation in outcome trails.

Low- Dose combination Therapy- Low-dose combination drug therapy using any two or three of the first-line antihypertensive agents should be considered for all patients with hypertension. High doses should be avoided whenever possible to avoid dose dependent side effects and toxicity. For most hypertensive patients, a CCB/ACEI (or ARB) combination is typically well-tolerated, very effective, and supported by RCTs BUT evidence also supports ACEI/diuretic or CCB/diuretic combinations. Because BP reduction rather than drug class accounts for most CV protection with antihypertensive drugs, the choice of drugs often comes down to what drugs an individual patient can tolerate well and afford. Long-term adherence is best for ARBs, intermediate for ACEIs and CCBs, and least for diuretics and beta-blockers. Thus combination therapy with a CCB plus an ARB (or an ACEI if cost is an issue) is an excellent option to initiate therapy regardless of age or race. Outcomes of monotherapy-based trials tend to underestimate the effectiveness of RAS blockers when used as combination therapy in black patients and elderly patients with low-renin hypertension. Fixed dose single-pill combinations that decrease pill burden include virtually every ACEI or ARB plus either amlodipine or HCTZ; recently, triple- therapy single-pill combinations have become available but with HCTZ rather than chlorthalidone.

### MATERIAL AND METHODS

Study design, site and duration-study design- cross- sectional study, study site- the present study was carried out in the Department of General Medicine, SAIMS Hospital Indore (M.P.) the patients included in this study were those admitted in the medical wards of our institute as well as those on outpatient treatment.

Study duration May 2017 to May 2019, total number of patients-60, Inclusion criteria-patient aged>=55 years. Duration of hypertension>=8 years. Exclusion criteria- patients

with less than 55 years of age. Duration of hypertension less than 8 years.

**Method-**The present study was performed in 60 patients aged  $\geq 65$  years old who presented to the Medicine Department, SAIMS Hospital, Indore with long standing ( $\geq 8$  years) hypertension during the period of May 2017 to May 2019. Complete history taking was including patient particulars, complaints, past history, personal history, family history, treatment history and compliance was done. The cardiovascular, respiratory and CNS system were examined in the patients as well as fundoscopy was done with an ophthalmoscope. Every patient underwent investigations like hemoglobin level, random blood sugar, blood urea, serum creatinine, serum electrolytes ( $\text{Na}^+$ ,  $\text{K}^+$ ), urine albumin, serum lipid profile, ECG, CXR (PA view) and 2D-ECHO. Dyslipidemia was considered in patients with S. Cholesterol  $\geq 250$  mg/dl, S.LDL  $\geq 125$ mg/dl and S.TG  $\geq 192$  mg/dl.

**Procedure-**This is a cross sectional study with appearance of patients once in the natural course of disease. Informed consent was taken from each patient enrolled in the study.

### OBSERVATION AND DISCUSSION

**Table 1** Age distribution of elderly hypertensive patients in the present study.

Age group	Male (%)	Female (%)	Total (%)
65-69	7 (33.33)	13(44.83)	20(40)
70-74	11(52.38)	8(27.59)	19(38)
75-79	2(9.52)	4(13.8)	6(12)
$\geq 80$	1(4.76)	4(10.34)	5(10)

The most common age groups affected were 65-69 years (39%) and 70-74 years (38%), the most common age group affected in males was 70-74 years while in case of females it was 65-69 years, the mean age of males was  $71.38 \pm 4.52$  years and that of females was  $73.06 \pm 4.54$  years.

**Table 2** Sex distribution of elderly hypertensive patients in the present study

Sex	Percentage %
Male	42
Female	58

In the present study, 58% patients were female and 42% patients were male, Male female ration was 1:1.3.

**Table 3** Comparison between LVH by ECG and LVH by 2D ECHO in present study

		LVH by ECHO		Total
		Present	Absent	
LVH by ECG	Present	38	0	38
	Absent	6	6	12
Total		44	6	50

### Chi square value-17.116 and p value-0.00003516

In the present study 38 patients had LVH by ECG criteria and all of them had LVH by 2D echocardiography, In our study there was statistically significant correlation found between LVH observed on ECG and 2D echocardiography, ECG is a very specific test for left ventricular hypertrophy and its specificity was 100% in the present study. Severity of retinopathy is correlated with long standing uncontrolled hypertension. The correlation between hypertension and severity of retinopathy was statistically not significant in the present study. This may be because of the cross-sectional nature of the present study where long term control of blood pressure could not be evaluated.

### Summary

**Demographics-**In present population, females were more than males, the most common age group affected was 65-74 years with a male: Female ration of 1:1.3. Presenting symptoms, risk factors, eye and cardiac complications.

### CONCLUSION

In the present study of clinical profile of elderly with long standing hypertension with special reference to fundus and 2D Echocardiography findings. The most common age group affected with hypertension in elderly was 65-74 years with greater prevalence in females. LVH or ECG was very strongly associated with left ventricular diastolic dysfunction. ECG was a very specific test to detect left ventricular hypertrophy.

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