Original Article

FREQUENCY OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN HYPERTENSIVE PATIENTS WITH HEART FAILURE

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Submission Date: 20-03-2019
Revision Date: 23-04-2019
Publication Date: 20-09-2019

Author's Contribution

AJ:Conducted the study and wrote the article. IW:Helped in review the article.MAN:Re-arranged data and corrected article.

All authors declare no conflict of interest.

This article may be cited as: Jamil A, Waheed I, Naqvi MA. Frequency of Left Ventricular Diastolic Dysfunction in Hypertensive Patients with Heart Failure. (J Cardiovasc Dis 2019;15(1):22 - 25)

ABSTRACT

INTRODUCTION:There is a plethora of scientific literature available which proves that Heart failure is among the most prevalent cardiac ailments globally. There is 20% chance of developing heart failure both in males and females. Hypertension is one of the leading causes of ischemic heart disease, with a persistent risk that commences at blood pressure values much lower than those defined as Hypertension.Left ventricular hypertrophy (LVH) is a complication of high blood pressure with 2 to 5 times elevated chance of developing ischemic heart disease and stroke. We aim in this study to find out the frequency of left ventricle diastolic heart failure in diagnosed cases of hypertension.

MATERIALS AND METHODS: This cross sectional study was conducted in Echocardiography department of Punjab Institute of Cardiology, Lahore Pakistan from 11-01-2014 to 12-07-2014. Hypertensive individuals with duration of hypertension >2 years presenting first time with signs & symptoms of heart failure and taking antihypertensive medication and of both male and female gender, with age between 60-80 years were included in the study. Non probability purposive sampling was done. Consent was taken from the patients. Same operator performed Transthoracic Echocardiography in all cases with assessment of the diastolic dysfunction which was recorded on a predesigned Performa. All this data was entered in SPSS version 17. Chi Square test was used.

RESULTS: Out of 150 cases, 92 cases (61.33%) were between 60-70 years and 58 cases (38.67%) were between 71-80 years of age, mean±SD was calculated as 68.64±4.67 years. 84 patients were male and 66 patients were females. Frequency of LV diastolic dysfunction in hypertensive patients presenting with heart failure was 42.67%(n=64) while 57.33%(n=86) had no findings of the morbidity.

CONCLUSION:There is a substantial evidence of high frequency of diastolic dysfunction of the Left Ventricle in hypertensive patients. Therefore, the recommendation is that all cases who present with hypertension and heart failure must be investigated for diastolic heart failure.

KEYWORDS: Heart failure, LV diastolic dysfunction, hypertension, frequency

(J Cardiovasc Dis 2019;15(1):22 - 25)

INTRODUCTION

The global burden of hypertension in the year 2000 was 26% of the adult population and the expected increment in the year 2025 is 24% in industrialized countries and 80% in developing world.[1] Heart Failure with preserved ejection fraction is present in 13% to 60% in heart failure patients according to research data.[2] Analysed on gender basis 39% hypertensive men and 59% hypertensive women suffered from Heart failure symptoms.[3]

Hypertension is a leading cause of Heart Failure[4] with 1 in 3 ratio risk of death annually and 2-3% mortality within 5 years. This percentage is much above the mortality figures known to us for many cancers.

The mortality risk that is currently estimated is 15% per year to be similar for both systolic and diastolic HF.[5-7]A recent increase in the incidence of Diastolic dysfunction and HFpEF is partially due to the fact that this entity is not fully investigated yet.[7-9]

MATERIALS AND METHODS:

150 enrolled patients were calculated with 95% level of confidence, 8% possibility of error. Taking expected frequency of LV diastolic dysfunction in 39% (5) of cases. Non probability purposive sampling was done. Hypertensive individuals with duration of hypertension >2 years presenting first time with signs & symptoms of heart failure (Dyspnea, Orthopnea, Paroxysmal Nocturnal Dyspnea) and taking antihypertensive medication with age between 60-80 years and both sexes were included in the study while patients with asymptomatic heart failure, renal disease, anaemia with haemoglobin less than 10 gm/dl, valvular heart disease and ischemic heart disease were excluded from the study.

Consent was taken from the patients and they were informed about the nature of study. Bio-data of study subjects including name, age, sex, address was noted. Same operator performed Transthoracic Echocardiography in all cases with assessment of the diastolic heart dysfunction (Elastance (E) septal<8, Early & late transmural gradient (E:A) < 0.75, Deceleration time (DT) >220ms, Isovolumic relaxation time (IVRT) > 100ms) which was recorded on a predesigned Performa. All this data was entered in SPSS version 11. The age was analyzed by mean ± standard deviation. Frequencies & percentages of gender & LV diastolic dysfunction were evaluated. Modifying variables like age, gender, duration of high blood pressure, BMI & degree of smoking was controlled by adopting stratification strategy. 'p' value less than to 0.05 was taken as significant after application of Chi Square test.

Table-1: Variables for LV Diastolic Dysfunction and frequency of LV Diastolic Dysfunction(n=150).

		LV Diastolic Dysfunction		P value
		Yes	No	
Age(in years)	60-70	28	64	0.000
	71-80	36	22	
Gender	Male	41	43	0.086
	Female	23	43	
Duration of hypertension	>2-5 years	29	62	0.000
	>5 years	35	24	
BMI	Obese	41	38	0.015
	Non-obese	23	48	
Smoking	Yes	35	32	0.03
	No	29	54	
LV diastolic dysfunction		64 (42.67%)	86 (57.33%)	0.03

RESULTS:

Out of 150 cases, mean age was 68.64±4.67 years, 92 cases (61.33%) were between 60-70 years and 58 cases (38.67%) were between 71-80 years of age. 84 patients (56%) were male and 66 (44%) patient were females. There were 91 (60.67%) patients with duration of hypertension >2-5 years and 59 (39.33%) patients with duration of hypertension >5 years. 79 (52.67%) patients were obese and 71 (47.33%) patients were non-obese.67 (44.67%) patients were smoker and 83 (55.33%) patients were non-smokers. Frequency of LV diastolic dysfunction in hypertensive patients presenting with heart failure was 42.67%(n=64) while 57.33%(n=86) had no findings of the morbidity.

DISCUSSION:

Heart Failure is among the commonest cardiovascular ailments globally which claims a large number of lives every year.Its prevalence increases with age: from less than 0.5-1% in the 20–40 age-group to over 21% in people age 80 year or older 10. Moreover, a 2-5 times risk of developing Myocardial Infarction has been attributed to Hypertension. Constant high blood pressure can cause an increase in capillary fibre ratio due to hypertrophy of the left ventricular wall resulting in an augmented myocardial oxygen demand and a decreased subendocardial blood supply. Biventricular Heart Failure is one of the leading disease which claim the lives of a number of patients every year. The importance of the problem is more intensified on account of its dreadful complications, difficulties in treatment and costly management protocols. 1% to 2% of the total health care expenditure in developed world is attributed to heart failure secondary

to diastolic dysfunction.

In this study it was evaluated how much diastolic heart failure is common in hypertensive population and this leads to the conclusion that it is quite frequent with percentage of 42.67% and another study showed that hypertension is associated with heart failure in 39-59% cases.[6]

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), reported that approximately 30% of adults were unaware of their hypertension; up to 40% of people with hypertension were not on drug treatment; and, of those treated, up to 67% did not have their BP controlled to less than 140/90mm Hg.[11]

The Eighth Report of the JNC (JNC 8) has given a high threshold and targets for BP control and its primary hypertension goal is to treat 150/90 mmHg blood pressure for patients aged 60 years and above while for all others the goal is 140/90 mmHg .[12]

Secondary hypertension where a different cause of hypertension is identified accounts for around 5-15% of the cases.[13]

There is corroborative evidence in previous studies about association of Prehypertension and heart disease. Hypertension, Obesity and metabolic syndrome bear a close association with diastolic dysfunction of the left ventricle. A research revealed that 47% of hospital admitted cases of heart failure were found to have preserved LVEF on echocardiography.[10] Another group of researchers revealed that 50% of their cases were older females and patients may also have atrial fibrillation, CAD, anaemia, diabetes, and renal failure.[14]

Multiple clinical studies have endorsed the usefulness of treating uncontrolled hypertension in prevention of diastolic dysfunction.There is a 45-50% decrease in the frequency of heart failure in hypertensive patients on drug treatment. Control of hypertension by drug treatment is associated with a reduction in incidence heart failure and repeated hospitalization.[2]

Decent therapeutic control of high blood pressure reduces left ventricular hypertrophy with a decrease in the incidence of overt diastolic dysfunction. In diagnosed cases of heart failure, a good control of high blood pressure can prevent the progression of disease, recurrent hospitalizations, exacerbations of stable disease.[1]

CONCLUSION:

We conclude that the frequency of diastolic dysfunction is high among the patients with high blood pressure presenting with symptoms of heart failure. It is therefore mandatory to screen all Hypertensive patients for Diastolic Dysfunction in order to prevent heart disease, remodelling of the heart and heart failure. It is recommended to devise appropriate therapeutic strategies besides a meticulous follow up of the patients who are hypertensive and present with heart failure.

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