

STUDY OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN PATIENTS COMING FOR ECHOCARDIOGRAPHY IN A TERTIARY CENTRE IN KATHMANDU

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ABSTRACT

Congestive heart failure due to diastolic dysfunction is common and causes significant mortality and morbidity. Treatment of diastolic dysfunction is unsatisfactory. Treatment targets on the mechanism that causes diastolic dysfunction and is focused on control of the risk factors responsible for diastolic dysfunction. Aim of this study is to determine the prevalence and risk factors like increasing age, higher Body Mass Index (BMI), diabetes, hypertension associated with diastolic dysfunction in patients attending a Teaching Hospital located in suburban area of Kathmandu. Total of 200 patients with diastolic dysfunction diagnosed with the help of mitral Doppler velocity in echocardiography were included in this study. Amongst the patients who underwent echocardiography the prevalence of diastolic dysfunction was 31.8%. The prevalence was more in females than in males, in elderly, in hypertensive patients and in patients with co-morbid conditions like diabetes and chronic obstructive pulmonary diseases. However, in contrast to the previous studies, it was seen more in patients with normal BMI than in those with higher BMI.

KEYWORDS

Congestive heart failure, diastolic dysfunction, echocardiography

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INTRODUCTION

One in nine deaths in United States in 2013 was because of heart failure(HF).¹ Despite of contemporary treatment modalities, HF is still a progressive disorder with a high morbidity and mortality rate.² HF with predominant abnormality in diastolic function is common³ and occurs in 40-60% of the patient with HF, with a prognosis similar to HF with reduced ejection fraction.³ When symptoms develop, it is often difficult to differentiate diastolic dysfunction (DD) from systolic dysfunction.⁴ Prevalence of DD increases with age, presence of coronary artery diseases, history of myocardial infarction, cardiomyopathies, diabetes and systolic dysfunction.⁵ Despite the fact that frequency of DD is expected to increase significantly in next decades, its pathophysiology is not completely defined which is the main reason for lacking an approved therapeutic protocol.² It is observed that the current medication recommended for DD do not improve the survival in patient with preserved ejection fraction. Therefore the main target has been to control the precipitating factors.² Long term clinical outcome of patients with heart failure and preserved ejection fraction is poor and not significantly different from patients with reduced ejection fraction.⁶

Despite the fact that the burden of disease is increasing, very little is known regarding the clinical profile of patients with DD in our part of the world. The aim of the study is to determine various clinical aspects of patients with DD.

MATERIALS AND METHODS

This is a cross-sectional observational study done in Cardiology unit of Nepal Medical College Teaching Hospital from May 2015 to November 2015. Ethical approval was obtained from Nepal Medical College, Institutional Review Committee. Total of 200 patients with diastolic dysfunction were included in this study. Diastolic dysfunction was diagnosed with the help of mitral Doppler velocity in echocardiography. Anthropometric values, co-morbid conditions and echocardiography findings were noted for these patients. Data was entered and analyzed using SPSS 16.

RESULTS

Diastolic dysfunction was present in 200 patients out of 628 patients who came for echocardiography during the period of study. Out of these 200 patients, 85 (42.5%) were males and 115 (57.5%) were females as shown in Fig. 1.

The median age in these patients was 64 years. 65 % of the patients with DD were of age more than 60 years whereas only 4.5 % of the patients were of age less than 40 years (Fig. 2).

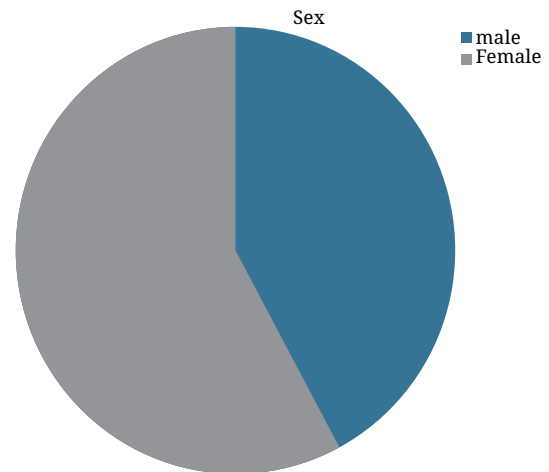


Fig. 1:
Distribution in different gender

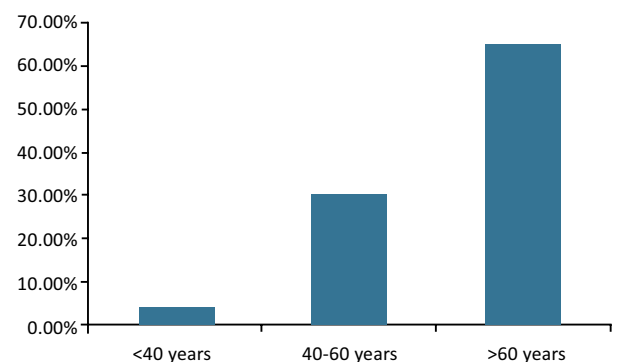


Fig. 2:
Distribution among different age groups

Our study also showed that 32.5 % of the patients with DD were either overweight or obese but significantly higher percentage of the people (67.5%) had BMI less than 25% (Figure: 3).

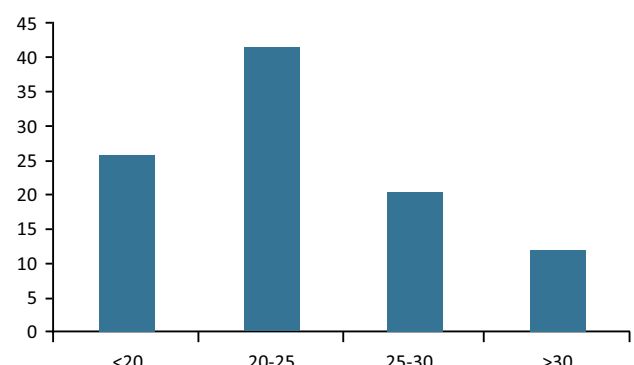


Fig. 3:
Distribution in different BMI

45.5 % of these patients had hypertension, 8% had diabetes and 20 % had COPD as shown in Table.

Table 1. Different co-morbid conditions associated with DD

	Yes Number	Yes %	No Number	NO %
DM	16	8	184	92
HTN	91	45.5	109	54.5
COPD	40	20	160	80

DISCUSSION

In our study, the overall prevalence of DD in patients coming for echocardiography was 31.8%. Similar finding was found in a study done by Kuznetsova *et al* which showed the prevalence of 27.3% in a random sample of general population.⁷ The reported prevalence of DD in general population varies from 11.1 % to 33.7%.^{8,9} There were different reports in regards to the prevalence of DD in different gender. 57.5 % of the patients with DD were female in our study. Similar finding of higher incidence was found in female population in other study also.^{4,6,10} However, in another study, diastolic abnormalities were observed in significantly higher rates than in men⁸ and yet in another the prevalence was nearly equal in both genders.¹¹ The prevalence of diastolic dysfunction increases significantly with age.^{8,9,12} In one of community based study, 53.8% people with age >65 years had diastolic abnormalities as compared to 12.8% in people <65 years.⁸ Similar results were seen in our study too. Only 4.5 % with DD were of age less

than 40 years, 30.0% were in between 40 to 60 years and 65% were more than 60 years of age. Previous studies reported direct association between higher body mass index and increased prevalence of LVDD.^{6,7} In a study done by Kuznetsova *et al*, BMI of a patients with normal diastolic function was 25.5 $\pm$ 3.6 as compared to >28 kg/m² in patient with DD.⁷ Our study showed different result as 41.5 % of the patients with DD had BMI of 20-25 kg/m² and lesser percentage of people that is 32.5% had BMI >25 kg/m².

Our study further showed that 45.5 % of the patients with DD were hypertensive. Similar result was reported in one of the study done in general population where 41 % of the patients with DD had hypertension.⁷ Other studies done by Redfield *et al* and Abhayaratna also reported the similar results.^{9,12}

In other studies also, diabetes and COPD patients had increased incidence of DD.⁵ Similar findings were there in our study. 20% of the patients had COPD and 8% were diabetic.

Overall prevalence of DD in patients coming for echocardiography was 31.8%. Prevalence was more common in female than in male. The median age in the studied population was 64 years and prevalence of DD increases with age. The prevalence also increases with cardiovascular comorbidities, as 45.5 % of these patients were hypertensive, 20% of the people had COPD and 8% had diabetes.

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