Original Article

Etiology of congestive heart failure at a tertiary care hospital

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ABSTRACT

Objective

To determine the frequency of various etiological factors responsible for causing congestive heart failure (CHF) in a tertiary care hospital in Peshawar, Pakistan.

Subjects and Methods

This retrospective, observational, single center study was conducted in Department of Medicine, Khyber Teaching Hospital, Peshawar from October 2009 to May 2010 and included 100 patients of CHF. After history and clinical examination, a diagnosis of CHF was established according to Framingham criteria. All patients had a 12-leads electrocardiogram (ECG), echocardiogram and serial blood tests.

Results

Out of 100 patients, 60% were male and 40% female with mean age of 54 years. Ischemic heart disease (IHD) was present in 35% of patients, hypertension in 27%, rheumatic heart disease (RHD) in 13%, cardiomyopathies in 11% and congenital heart disease in 6%.

Conclusion

IHD, hypertension, valvular heart disease and cardiomyopathy were the major causes of CHF in our patients. (Rawal Med J 2010;35:).

Key words: Electrocardiogram, echocardiogram, congestive cardiac failure.

INTRODUCTION

Congestive heart failure (CHF) is a condition that impairs the ability of the heart to fill with or pump a sufficient amount of blood through the body.[1] More than 550,000 patients are diagnosed with CHF for the first time each year in US.[2] The prevalence of CHF is known to rise with increasing age and affects about 10% of the population older than 75 years of age.[3,4] According to Framingham study, major criteria are paroxysmal nocturnal dyspnea, orthopnea, raised jugular venous pulse, lung crepitations, cardiomegaly and gallop sounds. Minor criteria were ankle edema, night cough, dyspnea on exertion, hepatomegaly, pleural effusion and tachycardia.[5] The diagnosis of predominantly systolic CHF required a minimum of two major or one major plus two minor criteria and LVEF<50%. The diagnosis of predominantly diastolic CHF required above mentioned clinical criteria, LVEF ≥ 50% and evidence of abnormal LV diastolic function by Doppler examination.

Limitations in activity can be quantified using the New York Heart Association (NYHA) functional classification or the more recent American Heart Association–American College of Cardiology classification.[6] AHA has reported IHD, hypertension, valvular heart disease, cardiomyopathies, cor pulmonale, anemia, hyper and hypothyroidism, chronic arrhythmias, anemia and cardiac fibrosis as common causes of HF.[7] Transthoracic two-dimensional echocardiography with Doppler flow studies[8] and transthoracic Doppler echocardiography allow confirmation of diagnosis.[9] ECG is valuable and a normal ECG virtually rules out systolic dysfunction with sensitivity of 94% and specificity 61%.[10] There is no nation wide data available about the epidemiology of CHF in Pakistan. The present study was designed to know the frequency of etiological factors causing CHF in our institution.

SUBJECTS AND METHODS

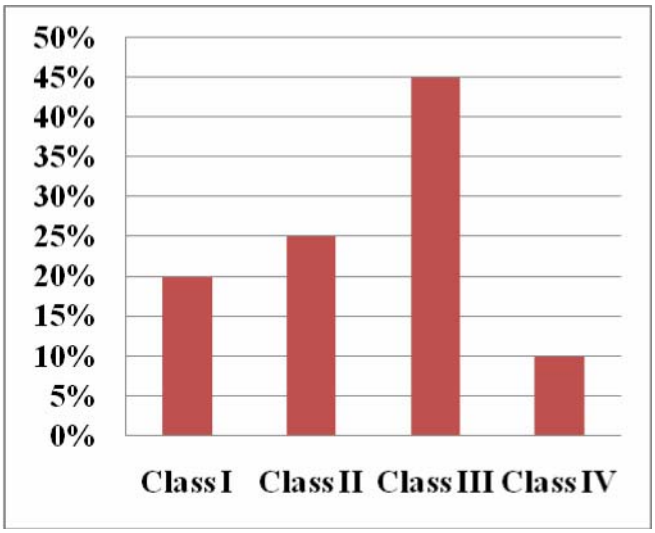
This retrospective, observational, study was conducted in Department of Medicine, Khyber Teaching Hospital, Peshawar from October 2009 to May 2010. A total of 100 patients with clinical and echocardiographic evidence of CHF were included in the study. Patients with acute CHF were excluded from the study. After history and clinical examination, diagnosis of CHF was made according to Framingham criteria.[5] Patient's initial clinical status was classified according to NYHA functional class.

After echocardiography, ejection fraction, valve diameter/gradient, regional wall motion abnormalities or any thrombus in the cavity were recorded. 12-leads ECG and serial blood tests like blood complete, blood sugar and urea, serum creatinine and electrolytes, lipid profile, urine examination, liver function tests (LFTs), X-ray chest and some special investigations like thyroid function tests (TFTs) were performed where needed.

RESULTS

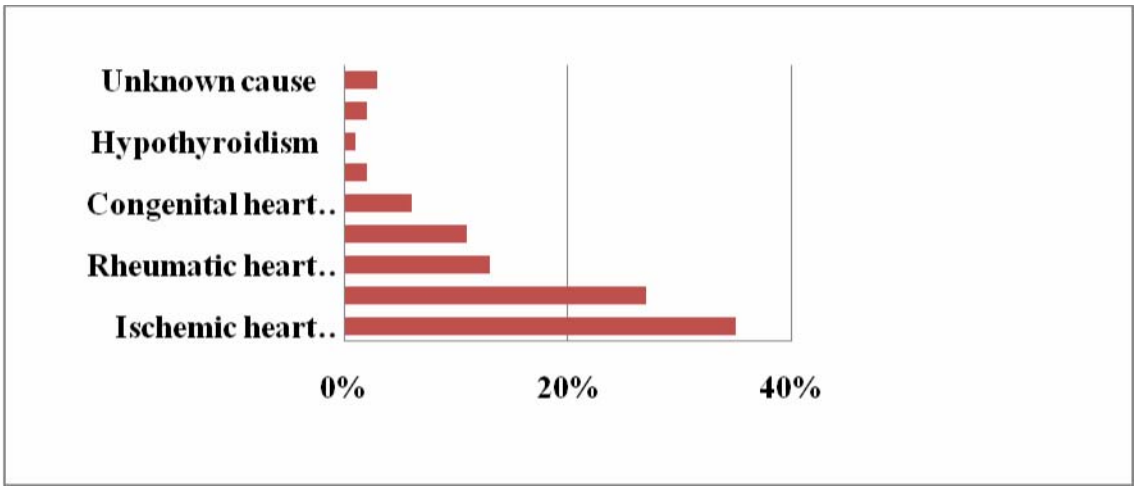
Out of 100 patients, male were 60% while female were 40%. Majority (68%) were in age range of 40-65. The mean age was 54 years (range 14-75). Most of the patients (45%) presented to the unit were in NYHA class III heart failure (Fig 1). IHD was the most common risk factor for CHF present in 35 (35%) patients. Hypertension was present in 27 (27%) patients, RHD in 13 (13%), cardiomyopathy in 11 (11%), congenital heart disease in 6 (6%) patients (Fig 2).

Fig. 1. NYHA classification of heart failure.



Sixty five patients (65%) had left ventricular systolic dysfunction with mean ejection fraction of 41.4% while 35 patients (35%) had diastolic ventricular dysfunction with mean ejection fraction of 66.8% on echocardiography. Three patients (3%) had thrombus in the left atrium. Four patients had mitral stenosis (MS) and 2 patients had mitral regurgitation (MR). Three patients had aortic regurgitation (AR) while one patient had aortic stenosis (AS) with mild MR. Three patients had involvement of 3 valves.

Fig. 2. Risk factors for CHF.



None of the patients had normal ECG. Left ventricular hypertrophy criteria on ECG[10] were identified in 24% of patients. T wave inversion and rhythm abnormalities including atrial fibrilation were seen (Table 1).

Table 1. ECG findings in patients with CHF.

S. No	OBSERVATIONS	COUNT	PERCENTAGE
1	"T" Wave inversion	60	60 %
2	Rhythm abnormalities	48	48 %
3	Abnormal ST-Segment (Elevated or depressed)	40	40 %
4	Left ventricular hypertrophy	24	24 %
5	Abnormal "P" Waves	18	18%
6	Abnormal Axis	40	40 %
7	Abnormal "Q" Waves	14	14%
8	Blocks of all type	08	08 %
9	Loss of "R" wave progression in chest leads	30	30 %

DISCUSSION

Many studies have reported gradual increase in the prevalence of HF with advancing age and affects 10% of population older than 75 years of age.[2-4] In our study, majority of the patients

were above the age of 40 years. Males outnumbered females. This may be because of higher prevalence risk factors in males. Moreover, preference is given to male for hospitalization and treatment as compared to females in our society.

IHD was recorded as the most common cause of HF in our study. Khan H et al found IHD as the leading cause of HF in 36% of patients which matches well with our study.[12] Another study reported IHD as the principal cause of CHF in 28% of patients.[13] RHD was reported in 44% patients of CHF in a local community.[14] In The Framingham Heart Study, hypertension was present in 77% and IHD in 45%.[15] Other studies from abroad also show IHD as the leading cause of heart failure.[16,17] Hypertension, recorded in 27% of the cases, was the second most common cause for CHF in our study. Ali et al[13] and Khan et al[12] also found hypertension as the second most common risk factor for CHF, present in 24% and 26% respectively. The findings of these two studies match well with present study. IHD and hypertension in combination were present in 16% of patients in our study.

RHD was the third most common cause of heart failure, present in 13% of patients. Most of the patients were in age group of 16-40. A study from Quetta showed that in 10-45 years of age RHD was responsible for HF in 56% of patients.[18] Hussain I et al[14] showed that RHD caused CHF in 44% of patients which is quite high as compared to our study. However, Khan H et al[12] found RHD in 9.3% CHF patients which is similar to our study. Cardiomyopathies were the fourth most common cause of HF, present in 11% of patients. Dilated cardiomyopathy was the most common type, present in 8% of patients with heart failure. This study correlates well with other studies.[12,14,19] Congenital heart diseases were present in 6% of patients with heart failure. Ventricular septal defect (VSD) and atrial septal defects (ASD) were the most common abnormalities amongst congenital heart disease. One patient had tetrology of Fallot. These findings are similar to already reported studies.[20]

Hyperthyroidism caused heart failure in 2% of patients while hypothyroid was the causative factor in 1% of patients. Anemia led to heart failure in 2% of patients. No cause could be identified in 3% of patients. No patient with heart failure had absolutely normal ECG in our study. This fact has been emphasized in other studies which found that absolutely normal ECG virtually excludes diagnosis of HF.[10,21] The limitations of this study are, it is confined to a single center and it has small number of patients. Therefore results cannot be generalized.

CONCLUSION

IHD, hypertension, RHD and cardiomyopathies are the major contributors to the heart failure in our patients. Majority of these risk factors are largely preventable, primarily through the control of blood pressure and other vascular risk factors.

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