

Original article

A hospital based study on causes peculiar of congestive cardiac failure (CCF)

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Abstract

Objective: To determine the frequency of risk factors of congestive cardiac failure in a tertiary care hospital of Peshawar. **Methods:** This retrospective observational study was conducted in department of Cardiology, Postgraduate Medical Institute, Lady Reading Hospital Peshawar, from March 2005 to September 2007. Relevant information regarding the risk factors of congestive cardiac failure were recorded on questionnaire prepared in accordance with the objectives of the study. **Results:** 1 019 patients with established diagnosis of cardiac failure (based on clinical findings and relevant investigations) were included. Out of total sampling 583 (57.12%) were males and 436(42.78%) were females. The age range of the patients was from 6 years to 82 years with mean age of 48.5 years and mode of age was 45 years. The distribution of causative factors of CCF was: ischemic heart disease (IHD) 36.31%, hypertension 26.30%, dilated cardiomyopathy 10.10%, obstructive and restrictive cardiomyopathies 5.39%, valvular heart diseases (VHD) 9.32%, congenital heart disease like ventricular septal defects (VSD) 4.41%, atrial septal defects (ASD) 0.58%, atrial fibrillation (AF) 2.25%, constrictive pericarditis 1.07%, Pericardial effusion 0.68%, chronic obstructive pulmonary disease and pulmonary hypertension 1.47%, thyrotoxicosis 0.68%, complete heart block 0.29% and paget disease in 0.09% cases. **Conclusion:** Ischemic heart disease, hypertension, cardiomyopathies, valvular heart disease and congenital heart disease are major contributor to CCF in our patients.

Keywords: Congestive cardiac failure (CCF); Causes peculiar to CCF; Peshawar

INTRODUCTION

Congestive heart failure (CHF), also called congestive cardiac failure (CCF) or just heart failure, is a condition that can result from any structural or functional cardiac disorder that impairs the ability of the heart to fill with or pump a sufficient amount of blood through the body^[1]. It is not to be confused with "cessation of heartbeat", which is known as asystole, or with cardiac arrest, which is the cessation of normal cardiac function with subsequent hemody-

namic collapse leading to death. Because not all patients have volume overload at the time of initial or subsequent evaluation, the term "heart failure" is preferred over the older term "congestive heart failure"^[2]. Congestive heart failure is often undiagnosed due to a lack of a universally agreed definition and difficulties in diagnosis, particularly when the condition is considered "mild". Even with the best therapy, heart failure is associated with an annual mortality of 10%^[3].

The symptoms depend largely on the side of the heart which is failing predominantly. Given that the left side of the heart pumps blood from the lungs to the organs, failure to do so leads to congestion of the lung veins and symptoms that reflect this, as well as reduced supply of blood to the tissues. The predominant respiratory symptom is shortness of breath on

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exertion (dyspnea, dyspnée d'effort) - or in severe cases at rest - and easy fatigability^[4]. Echocardiography is commonly used to support a clinical diagnosis of heart failure. This modality uses ultrasound to determine the stroke volume (SV, the amount of blood in the heart that exits the ventricles with each beat), the end-diastolic volume (EDV, the total amount of blood at the end of diastole), and the SV in proportion to the EDV, a value known as the ejection fraction. Normally, the EF should be between 50% and 70%; in systolic heart failure, it drops below 40%^[5]. No system of diagnostic criteria has been agreed as the gold standard for heart failure. Commonly used systems are the "Framingham criteria"^[6] (derived from the Framingham Heart Study), the "Boston criteria"^[7], the "Duke criteria"^[8] and functional classification is generally done by the New York Heart Association Functional Classification^[3]. American heart association has reported various causes of CCF as following^[9]:

- Causes of left-sided cardiac failure: hypertension (high blood pressure), aortic and mitral valve disease, aortic coarctation.
- Causes of right-sided cardiac failure: pulmonary hypertension (e. g. due to chronic lung disease), pulmonary or tricuspid valve disease.
- Causes that may affect both sides: Ischemic heart disease (due to insufficient vascular supply, usually as a result of coronary artery disease); this may be chronic or due to acute myocardial infarction (a heart attack), chronic arrhythmias (e. g. atrial fibrillation), cardiomyopathy of any cause, cardiac fibrosis, chronic severe anemia, thyroid disease (hyperthyroidism and hypothyroidism).

Present study was therefore designed as to determine the frequency of risk factors of congestive cardiac failure in a tertiary care hospital of Peshawar.

MATERIALS AND METHODS

A retrospective observational study was conducted in department of Cardiology, Postgraduate Medical Institute, Lady Reading Hospital Peshawar, from March 2005 to September 2007.

A total of 1 019 patients with established diagnosis of cardiac failure (based on clinical findings and relevant investigations) were included. Out of total sampling 583 (57.12%) were males and 436

(42.78%) were females were randomly selected.

A detailed history of patients was taken with the help of a predesigned questionnaire, prepared in accordance with the objectives of this study. Duration and family history were also recorded from every patient. Questioner also contained information regarding age, sex, address, and occupation of patients.

All patients with CCF irrespective of age and sex were included. Chief complaint and a detailed history was taken. Past and family history of major risk factors like hypertension, ischemic heart disease, valvular heart disease, congenital heart disease and thyroid etc were also recorded. Blood pressure of every patient was recorded. Fasting blood sugar, random blood sugar; serum cholesterol level, and triglyceride levels were also recorded from the ward record of patients. Electrocardiogram (ECG), ECHO and chest X-ray finding related to CCF were also noted.

Special investigation in few cases helped these were thyroid function tests, Trop T, cardiac enzymes tests etc were helpful in patients with CCF due to IHD and thyroid dysfunction. Exclusion criteria were all patients with similar clinical feature to CCF due to other causes like Asthma and COPD that had yet not progressed to CCF.

Finally statistical analysis of results was performed and association of risk factors with CCF was studied.

RESULTS

Sampling and sex ratio

In present study a total of 1 019 patients with established diagnosis of congestive cardiac failure (based on clinical findings and relevant investigations) were included. Out of total sampling 583 (57.12%) were males and 436 (42.78%) were females.

Age range

The age range of the patients was from 6 years to 82 years with mean age of 48.5 years and mode of age was 45 years (Table 1).

Causes peculiar to CCF

The distribution of causative factors of CCF was: ischemic heart disease (IHD) 36.31%, hypertension 26.30%, dilated cardiomyopathy

10.10% , obstructive and restrictive cardiomyopathies 5.39% , valvular heart diseases (VHD) 9.32% , congenital heart disease like ventricular septal defects (VSD) 4.41% , atrial septal defects (ASD) 0.58% , atrial fibrillation (AF) 2.25% ,

constrictive pericarditis 1.07% , Pericardial effusion 0.68% , chronic obstructive pulmonary disease and pulmonary hypertension 1.47% , thyrotoxicosis 0.68% , complete heart block 0.29% and paget disease in 0.09% cases (Table 2) .

Table 1 Age wise distribution of CCF patients (n = 1 019)

Age range(years)	Number of patients	Percentage of total (%)
0 – 20	152	14.91
21 – 40	225	22.08
41 – 60	468	45.92
≥60 years	174	17.07

Table 2 Distribution of causes of CCF(n = 1 019)

Causes of CCF	Number of patients	Percentage of total (%)
Ischemic heart disease (IHD)	370	36.31
Hypertension	268	26.30
Dilated cardiomyopathy	103	10.10
Obstructive and restrictive cardiomyopathies	55	5.39
Mitral valve diseases (regurge or stenosis)	33	3.23
Mitral and aortic involvement	47	4.61
Combined mitral aortic and tricuspid diseases	13	1.27
Tricuspid incompetence alone	2	0.19
Ventricular septal defects (VSD)	45	4.41
Atrial septal defects (ASD)	6	0.58
Atrial fibrillation (AF)	23	2.25
Constrictive pericarditis	11	1.07
Pericardial effusion	7	0.68
Chronic obstructive pulmonary disease and pulmonary hypertension	15	1.47
Thyrotoxicosis	7	0.68
Complete heart block	3	0.29
Paget disease	1	0.09

DISCUSISON

Congestive heart failure (CHF) is a condition in which the heart's function as a pump to deliver oxygen rich blood to the body is inadequate to meet the body's needs. Congestive heart failure can be caused by, diseases that weaken the heart muscle, diseases that cause stiffening of the hear muscles, or diseases that increases oxygen demand by the body tissue beyond the capability of the heart to deliver^[10]. In

present study we recorded patients in age ranging from 6 years to 82 years with mean age of 48.5 years and mode of age was 45 years. Prevalence of CCF increases with increasing age and affects about 10% of the population older than 75 years^[11]. We observed that ischemic heart disease (IHD) was the most common cause of congestive cardiac failure and was recorded in 36.31% of cases with CCF. Many studies reported from various countries of the world correlates with our findings and support the state-



ment^[12-14]. Hypertension was recorded as second most common risk factor of CCF in our patients and was recorded in 26.30% of cases. Hypertension is a major risk factor for developing cardiac hypertrophy and heart failure. It has been reported that hypertrophied and failing hearts display alterations in excitation-contraction (E-C) coupling. However, it is unclear whether remodeling of the E-C coupling system occurs before or after heart disease development. Chen-Izu Y et al^[15] reported that hypertension causes changes in the E-C coupling system which, in turn, induces hypertrophy.

Cardiomyopathies are third most important cause of CCF in our patients (15.49%). Cardiomyopathy is regarded as primary when the heart is considered to be the only organ involved. In secondary cardiomyopathy heart lesion is part of a systemic disease.

Dilated cardiomyopathy was recorded alone in 10.10% cases and Obstructive and restrictive cardiomyopathies in 5.39% cases. Our finding matches with that of Khan MA et al^[16] from Pakistan. In present study 9.32% cases of CCF were attributed to valvular heart diseases (VHD). Mitral valve disease was encountered in 3.23% of cases and our findings matches that of Aizawa K et al^[17]. Other valves aortic, tricuspid and pulmonary involvement were also significant and matching results are observed in various international studies correlating valvular diseases with CCF^[18,19]. Congenital heart disease recorded as leading factor for development of CCF. VSD was observed in 45 patients. The prevalence of congenital heart disease is likely to be underestimated because of trend towards home deliveries and brief stay of neonate in the hospital in case of hospital deliveries. Most cases are detected upon referral for cyanosis, clubbing or cardiac murmur. The number of patients with congenital heart disease is on increase because of steady addition and increased longevity^[20]. The prevalence of VSD in a study reported from Pakistan is (21%) and ASD was seen in 16% of patients in this series^[21]. At the end author would say that heart failure is a serious condition that has no cure, but you can live a full and enjoyable life with the right treatment and active attention to your lifestyle and its major risk factors are modifiable and can easily be prevented.

CONCLUSION

Ischemic heart disease, hypertension, cardiomyopathies, valvular heart disease and congenital heart disease are major contributor to CCF in our patients. While Constrictive pericarditis, pericardial effusion, chronic obstructive pulmonary disease and pulmonary hypertension, thyroid heart disease, complete heart failure and paget disease are minor contributor to CCF.

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