Cardiomyopathy and its Various Causes Among KP Population

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ABSTRACT

Background: Cardiomyopathy is an anatomic and pathological abnormality resulting in mechanical and electrical instability of the heart. It's among the leading causes of mortality and morbidity secondary to cardiac issues

Objective: To determine the burden of cardiomyopathy and its different types among population of KPK.

Material & Methods: This retrospective descriptive study was conducted in a private cardiology clinic from January 2018 to March 2018. Clinical and echo data from January 2015 to December 2017 was reviewed. Patients with diagnosed cardiomyopathy on echo were included in the study. Demographic data with comorbid conditions and echo data was recorded in a predesigned proforma. Data was analyzed in SPSS 20.0 with mean ± SD for continuous variables and frequency (%ages) for categorical variables. Chi-square test was applied to look for significance of disease burden with p=0.05 as significant.

Results: A total of 2422 patients with mean age of 55±17.1 years were enrolled in the study, of which 46% were males, 60% were diabetic and 49% were hypertensive while 50% were suffering from depression. ICM was the leading cause of CMP among our population having a frequency of 55%, followed by post-myocarditis CMP and peripartum CMP having a frequency of 11% and 10% respectively. VHD accounted for 6% cases among CMP and HOCM 7%. Rest of CMPs were quite rare.

Conclusion: CMP poses a significant disease burden in our society with ICM being the leading cause, followed by post-myocarditis CMP and peripartum CMP.

Keywords: *CMP: Cardiomyopathy, ICM: Ischemic Cardiomyopathy, VHD: Valvular Heart Disease, HOCM: Hypertrophic Obstructive Cardiomhyopathy.*

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INTRODUCTION

"Demoto Cordis" (Movement of the heart), a concept introduced by William Harvey in 1628.[1] However, the clear link between heart failure and structural heart diseases of the heart was not made until after four decades. Richard Lower wrote for the first time that inflammation in the parenchyma of the heart burdens the heart in circulating the blood. Lower also recognized for the first time that heart size in cardiomyopathies include a spectrum of diseases affecting the myocardium resulting in circulatory failure.[2] Heart is a specialized, highly innervated muscular pump that beats constantly for entire life. Heart, on an average beats 2.5 billion times during a 70 years lifespan. Cardiomyopathies (CMP) constitute a heterogeneous group of disorders of the heart muscle associated with electrical or/and mechanical dysfunction which show features of dilatation or inappropriate hypertrophy.[3]

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CMP is classified in a number of ways. Previously, CMP was labelled as "myocardial disease of unknown cause and was classified phenotypically into hypertrophic CMP, dilated CMP and restrictive CMP. Nowadays, CMP is classified into primary and secondary which both have further subgroups, according to AHA 2006 guidelines.[3] ESC also devised an algorithm in 2008 for classification of CMP.[4]

The main objective of our study was to determine the burden of CMP and its different types among population of KPK.

MATERIAL AND METHODS

This retrospective descriptive study was conducted in a private cardiology clinic from January 2018 to March 2018. Data regarding clinical presentation, demographics, comorbidities and echo reports was reviewed from January 2015 to December 2017. We only included those patients who had diagnosed CMP on echo assessment. All this data was recorded in a predesigned proforma.

Statistical Analysis

Data was analyzed in SPSS 20.0. Mean ± SD was calculated for continuous variables. Frequencies (%ages) were calculated for categorical variables. Chi-square test was applied to look for significance of disease burden with p=0.05 as significant.

RESULTS

A total of 2422 patients were included in the study with a mean age of 55±17.1 years. Of these, 46% were males and 54% were females. Data regarding co-morbid conditions and risk factor assessment for cardiac diseases is given in Table I.

TABLE I: RISK ASSESSMENT FOR CMP

VARIABLES	FREQUENCY (%AGE)
Total Number of patients (n)	2422
Mean Age	55±17.1
Sex (M)	1114 (46)
DM	1453 (60)
HTN	1186 (49)
Family Hx of CAD	889 (37)
Family Hx of arrhythmias	411 (17)
Smoking	266 (11)

TABLE II: ECHO PARAMETERS

Echocardiography was performed for all the patients and echo parameters are given in Table II.

ECHO: VARIABLES	VALUES
LV End Diastolic Diameter	5.8±1.9 (cm)
LV End Systolic Diameter	4.7±1.1 (cm)
Fractional Shortening	19.1±8.8
LV Ejection Fraction	38.6±14.4
Mitral Regurgitation	63%
Aortic Regurgitation	31%
Tricuspid Regurgitation	29%
RV Systolic Pressure ↑	31%
Left Atrium dimension	4.0±1.0 (cm)
Right Ventricle dimension	3.0±1.5

↑=Increased

According to our study results, IHD resulting in ICM was the leading cause of CMP in our population, accounting for 55% of the CMP cases. Post-myocarditis CMP and peripartum CMP were the second and third common causes accounting for 11% and 10% cases respectively. Percentages for HOCM, CMP secondary to VHD and CMP secondary to hypo and hyperthyroidism were 7%, 6% and 5.5% respectively. We also identified the cases of restrictive CMP, infiltrative CMP and Takatsobu CMP during our study. Results are shown in Table III.

TABLE III: CAUSES IN OUR POPULATION

TYPE OF CARDIOMYOPATHY	FREQUENCY (%AGE)	P-VALUE
ICM	1332 (55%)	0.001
HOCM	170 (7%)	0.05
Restrictive CMP	109 (4.5%)	0.07
Acquired		
Post-myocarditis	266 (11%)	0.005
Peripartum	242 (10%)	0.007
Takatsobu	12 (0.5%)	0.790
VHD	145 (6%)	0.07
Infiltrative		
Hemochromatosis	12 (0.5%)	0.790
Sarcoidosis	24 (1%)	0.1
Hypo/Hyperthyroidism	130 (5.5%)	0.05

DISCUSSION

Cardiomyopathy (CMP) is an anatomic and pathological abnormality resulting in mechanical and electrical instability of the heart. According to statistical data available for the West, dilated CMP was the most common cause of CMP there, affecting 5 in 100000 adults and 0.57 in 100000 children. In USA, it is the third ranked cause of cardiac failure preceded by coronary artery disease (CAD) and hypertension. Hypertrophic Obstructive CMP having an incidence of 1 in 500 among adults is the leading cause of sudden cardiac death. However, restrictive CMP, peripartum CMP, arrhythmogenic right ventriular CMP (ARVC) etc. are rare entities.[5-8]

In contrast, our study shows that in our population, after ischemic CMP (ICM), peripartum CMP and post-myocarditis CMP are the 2nd and 3rd most common causes. Probably, the reason being multiple pregnancies, uncontrolled HTN during perinatal period, undiagnosed diabetic females undergoing pregnancy, untreated upper and lower respiratory tract infections leading to myocarditis and poor socio-economic conditions of our population. Emphasis needs to be given to improved quality of life of our population to reduce the incidence of the CMPs.

Treatment of CMP is mainly directed at the underlying cause. Majority of the patients with CMP develop heart failure.

Highly symptomatic patients should be offered non-pharmacological therapies like cardiac resynchronization therapy (CRTD) etc. The treatment of restrictive CMP is different because the underlying processes do not respond to intervention. Conservative management with chelation therapy, phlebotomy, BMT (Bone Marrow Transplant), salt restriction is usually needed. In cases of ARVC, arrhythmia suppression should be the aim.[10, 11] Electrophysiological studies with catheter ablation and implantable cardioverter defibrillators (ICDs) have important role in this.[14]

Lifestyle modifications with improvement in socio-economic status and healthcare facilities are the key steps to decrease the burden of CMP in our population.

CONCLUSION

Cardiomyopathy poses a significant disease burden in our population with ICM being on top, followed by post-myocarditis CMP and peripartum CMP. However, this burden can be reduced significantly with improvement in socio-economic status and healthcare facilities in our society.

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