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Research Article

A cross sectional study on cardiac dysfunction in HIV positive patients

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ABSTRACT

Objective: To assess the clinical profile of cardiac dysfunction in HIV positive patients presenting at Bahawal Victoria Hospital Bahawalpur.

Material and methods: This cross sectional study was conducted at Department of Cardiology, Bahawal Victoria Hospital, Bahawalpur from July 2017 to March 2018. Total 60 HIV positive patients were selected and clinical profile of cardiac dysfunction was assessed.

Results: Total 60 HIV positive patients were selected. Total 14 (23%) patients belonged to age group 20-30 years, 32 (54%) patients belonged to age group 31-40 years and 14 (23%) patients belonged to age group 41-50 years. Male patients were 38 (63%) and female patients were 22 (37%). Echocardiographic abnormalities were identified in 35 of 60 patients (58.3%). These included left atrial enlargement in 8 patients, left ventricular dilatation in 23 patients, concentric LVH in 9 patients, LV diastolic dysfunction in 15 patients, DCM in 9 patients, small pericardial effusion in 8 patients and mild PAH in 6 patients

Conclusions: Findings of present study revealed that male patients are more victim of cardiac dysfunction as compared to female patients. Age group 31-40 years was the most affected age group. Cardiac involvement was inversely associated with CD-4 Count of the patient.

Key words: CD-4 Count, cardiac dysfunction, CVD, CHD

INTRODUCTION

Cardiovascular disease (CVD) isa group of disorders of the heart and blood vessels which can manifest as coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism.[1] It is a primary cause of death worldwide with atherosclerosis being the most common pathological process that leads to it, involving a combination of vascular endothelial dysfunction, chronic inflammation, and dyslipidaemia.[2] According to the Global burden of disease study, current predictions estimate that by the year 2020, CVD, notably coronary heart disease (CHD), will become the leading global cause of total disease burden.[3]

Several risk factors for CVD have been identified and can be categorized into two groups:

Modifiable (by lifestyle and/or pharmacotherapy) and Unmodifiable.[4] The traditional risk factors for CVD recognized by the current National Cholesterol Education Project (NCEP) Adult Treatment Panel III (ATP III) guidelines include: age: men ≥45yrs, women ≥55yrs, cigarette smoking, hypertension or use of antihypertensive medication, dyslipidaemia, diabetes mellitus, obesity, family history of premature CHD in a first degree relative male ≤55yrs or female ≤65yrs, and prior CVD in the index individual.[5]

The aetiology of cardiovascular manifestations associated with HIV is still not well established.[6]It may be attributed to virus itself, the effects of anti-retroviral medications; or altered immune mechanisms associated with the infection. The cardiac diseases in HIV infections include pericardial effusion, left ventricular dysfunction, myocarditis, dilated cardiomyopathy, endocarditis, pulmonary hypertension, malignant neoplasm, coronary artery disease and drug related cardio toxicity.[7] CD-4 count is the most robust surrogate marker for immune competence and its decline results in the development of opportunistic infections and disease progression.[8] We conducted this study since there were only relatively few studies from our country in this regard.

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Cardiology, Bahawal Victoria Hospital, Bahawalpur from July 2017 to March 2018. Total 60 HIV positive patients (newly diagnosed cases and patients on follow up care) having age from 20-50 years either male or female were selected.

Patients suffering from congenital heart disease, rheumatic heart disease, hypertension and ischaemic heart disease were excluded from the study. An approval was taken from institutional review committee. Written informed consent was taken from every patient.

All patients were subjected to cardiovascular investigation like ECG, ECHO and chest x-ray. All relevant findings of echocardiography like of LV internal dimension in systole (LVIDs] LV internal dimension in diastole [LVIDd] interventricular septal thickness in systole and diastole, and ejection fraction [EF] were studied. All patients were evaluated for their CD4 counts and were analyzed for various cardiac dysfunctions.

Findings were entered in pre-designed performa along with demographic profile of the patients.

All the collected data entered in SPSS version 18 and analyzed. Mean and SD was calculated for numerical data. Frequencies and percentages were calculated for categorical data.

RESULTS

Total 60 HIV positive patients were selected. Patients were divided into 3 age groups i.e. age group 20-30 years, age group 31-40 years and age group 41-50 years. Total 14 (23%) patients belonged to age group 20-30 years, 32 (54%) patients belonged to age group 31-40 years and 14 (23%) patients belonged to age group 41-50 years. (Fig. 1) Out of 60 patients, male patients were 38 (63%) and female patients were 22 (37%). (Fig.2) One patient had a CD-4 count above 500, 24 (40%) between 200-500, 22 (36%) between 50-200 and 13 (21.7%) below 50. Thirty five patients had a CD-4 count below 200 (Table 1).

Twenty patients (33.3%) had mild symptoms. Most common symptom was fatigue present in 11 patients (18.3%). Eight patients (13.3 %) had class II exertional dyspnoea, seven patients (11.7%) had class II exertional palpitation and 3 patients (5 %) had class II effort angina. All patients were ambulant with no restriction for their daily activities.

General examination were normal in majority, except for three (5%) with a BMI less than 18.5, six (10 %) with pallor, 14 (23.3 %) with oral thrush and 19 (31.7 %) patients with lymphadenopathy. ECG abnormalities were identified in 18 of 60 patients (30%). These included Sinus tachycardia in 3 patients, Left atrial overload (LAO) in 4 patients, Bundle branch block pattern in 4 patients (2 with RBBB and 2

with LBBB), LVH in 2 patients and 9 patients with ST-T wave abnormalities (Table 2).

Echocardiographic abnormalities were identified in 35 of 60 patients (58.3%). These included left atrial enlargement in 8 patients, left ventricular dilatation in 23 patients, concentric LVH in 9 patients, LV diastolic dysfunction in 15 patients, DCM in 9 patients, small pericardial effusion in 8 patients and mild PAH in 6 patients (Table 3).

Among the 20 symptomatic patients; 15 had a CD- 4 Count below 200 and 5 had a CD 4 above 200.Even though symptoms were common in patients with CD- 4 Count below 200 there was no statistically significant correlation. Among the 18 patients with ECG abnormalities; 11 (61%) had a CD 4 count below 200 and 7 (39%) had a CD 4 count above 200 with no statistically significant correlation. Among the 35 patients with echocardiographic abnormalities; 26 patients had a CD 4 Count below 200 and 9 patients had a CD 4 Count above 200, which was statistically significant (P<0.01) (Table 4).

In present study 15 patients (25%) had Diastolic dysfunction, 10 were male and 5 were female and 13 patients were on ART. Among the 15 patients with LV Diastolic dysfunction, eleven patients had a CD 4 Count below 200 and 4 patients had a CD-4 Count above 200 and correlation was not statistically significant.

In present study DCM was present in 9 patients (15%) and eight patients were on ART. Among them seven patients had a CD 4 Count below 200 and two patients had a CD 4 Count above 200. No statistically significant correlation was noted between DCM and CD-4 count.

Concentric LVH was present in 9 (15%) patients, 5 were male patients and 4 were female patients and all were on ART. Among the 9 patients with concentric LVH, 8 patients had a CD 4 Count below 200 and only 1 had a CD 4 Count above 200, which was statistically significant (Table 5).

Fig. 1 Age distribution of patients

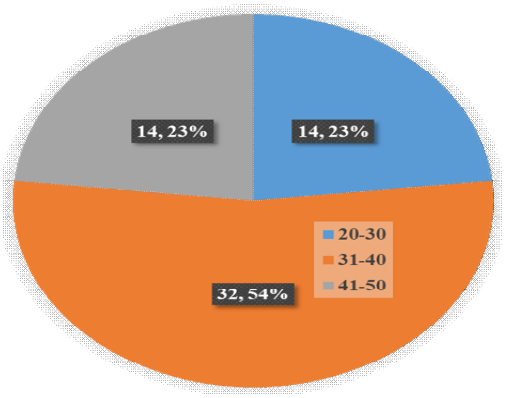

Fig.2 Gender distribution of the patients

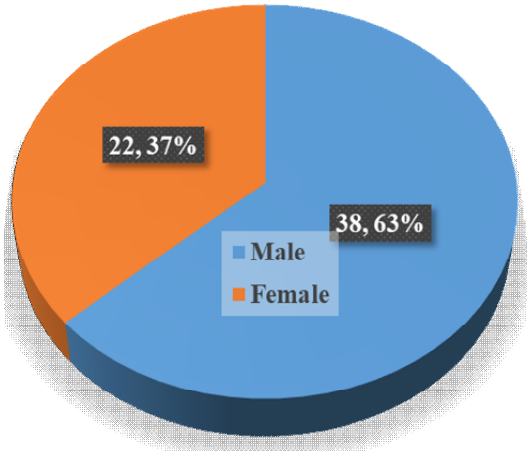

Table 1: CD-4 count

CD-4 count	Frequency	Percentage
<50	13	21.7
50-200	22	36.7
200-500	24	40
≥500	1	1.7

Table 2: ECG

ECG	Frequency	Percentage
NSR	42	70
Sinus tachycardia	1	1.7
LAO	1	1.7
RBBB	2	3.3
LBBB	2	3.3
ST_T wave changes	2	3.3
Tachycardia + ST_T wave	2	3.3
LAO + ST_T wave	3	5
LVH + ST_T wave	2	3.3

Table 3: Echo cardiographic abnormalities

Echo cardiographic abnormalities	%age
Left atrial enlargement	13.3%
Left ventricular dilatation	38%
Left ventricular diastolic dysfunction	25%
Left ventricular hypertrophy	15%
Dilated cardiomyopathy	15%
Pericardial effusion	13.3%
Pulmonary artery hypertension	10%

Table 4: Echo and CD-4 count

Echo	CD-4 count		Total	P value
	≤200	>200		
Nil	9 (25.70%)	16 (64%)	25 (41.70%)	<0.01
present	26 (74.30%)	9 (36%)	35 (58.30%)	

Table 5: Concentric LVH and CD 4 count

Concentric LVH	CD-4 count		Total	P value
	≤200	>200		
Nil	27 (77.1%)	24 (96%)	51 (85%)	<0.05
present	8 (22.90%)	1 (4%)	9 (15%)	

DISCUSSION

Purpose of present study was to evaluate clinical profile of cardiac dysfunction in patients with HIV infected patients. Among them all were below fifty years and majority (76.6%) were below forty years, indicating the general transmission trend in India and 63.3% were male and 36.7% were female with a male: female ratio of 1.7:1.These data were in concordance with the recent NACO, HIV estimation report 2015. All patients were ambulant with majority (66.7%) having no significant symptoms and minimal symptoms in 33.3%. Nineteen (31.7%) patients had abnormal signs on cardio vascular examination.

Electrocardiographic abnormalities were identified in 18 patients (30%). These included Sinus tachycardia, Left atrial enlargement (LAE), Bundle branch block pattern, LVH and ST-T wave abnormalities. Warren S. Levy et al studied sixty consecutive patients with HIV infectionusing echocardiography and ambulatory ECG. ECG abnormalities were present in 22 of 50 patients (44%).7 Soliman EZ et al studied the prevalence and prognostic significance of ECG abnormalities in HIV-infected patients; more than half of the participants (n = 2325, or 51.5%) had either minor or major ECG abnormalities. Minor ECG abnormalities (48.6%) were more common than major ECG abnormalities (7.7%).[9]

Echocardiographic abnormalities were identified in 35 of 60 patients(58.3%).These included left atrial enlargement (13.3%), left ventricular dilatation (38%), concentric left ventricular hypertrophy (15%), LV diastolic dysfunction (25%), dilated cardiomyopathy (15%), small pericardial effusion(13.3%), isolated LV systolic dysfunction and mild PAH (10%) .

In present study even though DCM and left ventricular systolic and diastolic dysfunctions were common in patients with low CD-4 Count, statistically significant correlation were not present. Left ventricular concentric hypertrophy had an inverse relation with CD-4Count and it was statistically significant. Though chamber hypertrophy was mentioned in HIV infection, a statistically significant correlation with CD-4 Count was not described in the previous studies we analyzed. In our study 10 patients had reduction in ejection fraction and nine out of this ten had chamber dilatation accounting to DCM and one had isolated systolic dysfunction.

No patient had clinical or echocardiographic evidence of infective endocarditis. This may be due to absence of intravenous drug abusers in present study population. Himelman RB, et al studied 70 consecutive patients with HIV infection using two dimensional Doppler echocardiography and abnormalities detected were almost similar to present study with DCM in 8 patients (11%), pericardial effusion in 7 patients (10%), mediastinal mass in one patient.[10]Basavaraj Anita et al, B.J. Medical College, Pune studied cardiac dysfunction associated with HIV infection; in forty HIV infected cases; 22 (55%) cases were found to have cardiac abnormalities. Twenty-one cases (55%) had X-ray abnormalities, 45% had ECG changes, eighteen (68%) patients had echocardiographic evidence of pericardial effusion and twelve cases had LV dysfunction.

Previous studies have shown that HIV related cardiac manifestations are often seen in a state of severe immunosuppression with low CD4 Count (CD4<200).[11-12] In present study patients with CD4 count less than 200 had a high prevalence of some echocardiographic abnormalities than those with CD4 count more than 200 and the correlation was statistically significant. Studies agree that the most important factor in development of cardiac abnormalities is the level of immunosuppression and there is strong correlation between CD4 count and echocardiographic abnormalities, which was also observed in present study.[13]

CONCLUSION

Findings of present study revealed that male patients are more victim of cardiac dysfunction as compared to female patients. Age group 31-40 years was the most affected age group. Cardiac involvement was inversely associated with CD-4 Count of the patient.

REFERENCES

1. Roger VL, Go AS, Lloyd-Jones DM, Adams RJ, Berry JD, Brown TM, Carnethon MR, Dai S, De Simone G, Ford ES, Fox CS. Heart disease and stroke statistics—2011 update: a report from the American Heart Association. Circulation. 2011 Feb 1;123(4):e18-209.
2. Altman R. Risk factors in coronary atherosclerosis athero-inflammation: the meeting point. Thrombosis journal. 2003 Dec;1(1):4.
3. Gaziano TA, Bitton A, Anand S, Abrahams-Gessel S, Murphy A. Growing epidemic of coronary heart disease in low-and middle-income countries. Current problems in cardiology. 2010 Feb 1;35(2):72-115.
4. Petursson H, Getz L, Sigurdsson JA, Hetlevik I. Can individuals with a significant risk for cardiovascular disease be adequately identified by combination of several risk factors? Modelling study based on the Norwegian HUNT 2 population. Journal of evaluation in clinical practice. 2009 Feb;15(1):103-9.
5. Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP). Expert Panel on Detection, Evaluation, and treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA. 2001; 285(19):2486-2947.
6. Friis-Møller N, Weber R, Reiss P, Thiébaut R, Kirk O, Monforte AD, Pradier C, Morfeldt L, Mateu S, Law M, El-Sadr W. Cardiovascular disease risk factors in HIV patients–association with antiretroviral therapy. Results from the DAD study. Aids. 2003 May 23;17(8):1179-93.
7. Barbaro G. Cardiovascular manifestations of HIV infection. Journal of the Royal Society of Medicine. 2001 Aug;94(8):384-90.
8. KK SK, Jayakumar B, Baiju R. A study of clinical profile of cardiac dysfunction in patients with HIV infection. International Journal of Research in Medical Sciences. 2016 Dec 16;4(12):5149-53.
9. SolimanEZ ,Prineas RJ, Roediger MP, Duprez DA, Boccara F, Boesecke. Prevalence and prognostic significance of ECG abnormalities in HIV-infected patients: J Electrocardiol. 2011;44(6):779-85.
10. Himelman RB, Chung WS, Chernoff DN, Schiller NB, Hollander H. Cardiac manifestations of human immunodeficiency virus infection: A two-dimensional echocardiographic study. J Am CollCardoil. 1989;13(5):1030-6.
11. Castro SD, Migliau G, Silvestri A, D'amati G, Giannantoni P, Cartoni D, et al. “Heart Involvement in AIDS: A Prospective Study during Various Stages of Diseases,” European Heart J. 1992;13:1452-9.
12. Devi SB, Singh SD, Ningshen R. CardovascularManfestations of HIV infection/AIDS,” Postgraduate Medicine, Association of Physicians of India, Mumbai. 2012;55:537-50.
13. Reinsch N, Kahlert P, Esser S, Sundermeyer A, Neuhaus K, Brockmeyer N. Till Neumann Echocardiographic Findings and Abnormalities in HIV Infected Patients: Results from a Large, Prospective, Multicenter HIV-Heart Study. Amer J Cardiovascular Dis. 2011;1(2):176-84.