Original Research Article

Study to determine various echocardiographic abnormalities and its correlation with CD4 count in patients with HIV infection at tertiary care hospital in Mumbai, India

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ABSTRACT

Background: The prevalence of echocardiograhic abnormalities in HIV/AIDS patients is uncertain in India. Early screening and prompt treatment are important to prevent significant morbidity from cardiac involvement and to promote long term health in PLHIV. Hence the present study was undertaken to determine various Echocardiographic abnormalities and their correlation to CD4 counts.

Methods: This prospective cross-sectional study was carried out in the BYL Nair Hospital, Mumbai during the period of Nov 2011 to Oct 2012. A total of 150 adult patients (age >18 years) were included. Their demographic, clinical data along with routine investigations, CD4 count, and 2D ECHO using Philips iE 33 were carried out and recorded. Echocardiographic criteria for various abnormalities were applied as per American Society of Echocardiography Guidelines. Data was analysed by using SPSS 13 software. Results reported as percentage or mean±standard deviation and p value <0.05 was considered significant.

Results: In our study, 57.3% were males and 42.7% females with a mean age of 37.69(±7.81). Most patients belonged to WHO clinical Stage II (48.0%) and III (38.0%). Patients presented with symptoms of breathlessness (52.7%), fever (44.0%), chest pain (24.0%), palpitations (20.0%) and pedal edema (13.3%). CD4 count was <200/microL (40.6%), between 200-499/microL (42.3%) and ≥500/microL (17.3%). Echocardiographic abnormalities were seen in 91.3% of cases. Pulmonary artery hypertension (88.0%), diastolic dysfunction (55.3%), reduced EF (<60%) in 16.7%, LV systolic dysfunction 16%, pericardial effusions 14.3%, regional wall motion abnormalities (RWMA) seen in 12.7%, left atrial enlargement in 6% and dilated cardiomyopathy seen in 5.3% patients. Echocardiographic abnormalities increased with CD4 counts less than 200/microL was statistically significant. Pulmonary hypertension and diastolic dysfunction were seen amongst all CD4 categories.

Conclusions: Echocardiographic abnormalities in PLHIV are common and increases with advanced stages of HIV infection. Pulmonary hypertension and diastolic dysfunction being most common abnormalities. Echocardiography should be included as screening for early recognition and treatment of cardiac dysfunction for promoting long term health in PLHIV.

Keywords: CD4+ T cell counts, Echocardiography, ETV, HIV/AIDS, Tertiary care teaching hospital procedure

INTRODUCTION

Widespread use of highly active anti-retroviral therapy (HAART) since 1996 has resulted in marked and durable declines in HIV-associated mortality and morbidity, with consequent improvements in quality of life. With the dramatic scale-up of access to anti-retroviral therapy (ART) in many countries with differing baseline risk

factors for cardiovascular disease (CVD), it is important to determine the prevalence of ART associated complications, such as dyslipidemia, in different patient populations. Patients initiating ART in resource-limited settings may experience different rates and types of cardiovascular abnormalities than patients in resource-sufficient countries because of differences in genetic background, dietary intake, and lifestyle factors. In addition, patients in resource-limited settings are more likely to have advanced HIV disease and poor nutritional status and to begin treatment with non PI-based regimens. Cardiac involvement in AIDS patients was first described in 1983 by Autran et al who reported myocardial Kaposi sarcoma at autopsy.[1]

The prevalence of cardiac involvement in AIDS patients has been reported to range between 28% and 73%. Because of the longer survival in HIV patients who were on the treatment, more manifestations of late-stage HIV infection will be seen, including HIV-related cardiac diseases. These cardiac diseases include pericardial effusion, myocarditis, dilated cardiomyopathy, endocarditis, pulmonary hypertension, malignant neoplasms, coronary artery disease, and drug-related cardiotoxicity.[2] Echocardiography is very helpful in detecting cardiac dysfunction at an early stage, much before overt clinical manifestations develop.[3] Early recognition and prompt treatment are important to prevent significant morbidity from cardiac involvement.[4]

Hence was the need for the present study, which was undertaken to study the Clinical profile of HIV/AIDS patients with respect to investigations like electrocardiogram and echocardiography, their correlation to CD4 counts.

The objective of the study was to assess the prevalence of various echocardiographic abnormalities and clinical profile in HIV positive patients and its correlation with CD4 count.

METHODS

This is a prospective cross-sectional study. The ethical committee clearance was obtained from the appropriate authority appointed by the institution. In this study 150 consecutive patients either admitted or visiting the Out-Patient Department in Topiwala National Medical College and BYL Nair Hospital, Mumbai. It is tertiary care hospital with own teaching institute catering to a population coming from all classes of society but predominantly from the middle and lower classes. Patients who fulfilled the inclusion criteria i.e. Patients , Men and women, age group >18 years diagnosed to have HIV infection/AIDS after ELISA test being positive and who gave a written informed consent, were recruited. All patients included in the study were informed about the purpose of the study. Patients were screened for exclusion criteria i.e. Patients with other conditions known to be associated with high cardiovascular risks

like ischaemic heart disease, congenital heart diseases, pre-existing valvular heart disease, diabetes mellitus, hypertension and chronic alcoholism and chronic obstructive airway diseases.

The study was carried out over a period of one year. No one refused to participate in the study. Hence the total sample size came to 150 patients. Routine blood investigations viz. complete hematogram, fasting blood sugar, liver function tests, renal function tests, complete lipid profile and special investigations like ECG and 2D echo were carried out in every patient.

The nature of the study was explained to the patients and an informed consent was taken. All patients were assessed clinically by detailed history taking and thorough clinical examination and findings recorded as per proforma. Specific investigations were undertaken to screen for opportunistic infections. CD4 count was done for all patients using flowcytometry using a BD FACS count system using kits supplied by the National AIDS Control Organization of India (NACO) to ART centre at tertiary care hospital.

All patients were evaluated using M mode and two dimensional transthoracic echocardiography and colour flow Doppler examination using Philips iE 33 in the department of cardiology of our institution. Each two dimensional study consist of parasternal long and short axis, and apical two and four chamber views. The conventions of American Society of Echocardiography were followed in obtaining left atrial dimensions, left ventricular end systolic and end diastolic dimensions, right ventricular end diastolic dimensions and left ventricular fractional shortening (FS) 7. Left ventricular volumes were measured and ejection fraction (EF) was calculated. The presence of pericardial effusion, any valve regurgitation and any regional wall motion abnormalities was looked for.

Statistical analysis

Statistical analysis of data was done using SPSS 13 software. All results are reported as the percentage of patients found to have the given abnormality or as mean±standard deviation. For all analyses, a p value <0.05 was considered significant.

RESULTS

In this study, 150 consecutive patients either admitted or visiting the out-patient department in the tertiary care hospital were studied. As show in the Table 1 that 57.3% were males and 42.7% females. It was seen from Table 2 that the age of the patients studied ranged between 19 and 64 years. Majority of the patients, out of the 57.3% males and 42.7% females were young and were in the age group of 31 to 40 years. The mean age of the entire study population was 37.69(±7.81).

Table 1: Distribution among the cases with respect to sex.

Sex	Number	Percentage
Female	64	42.7%
Male	86	57.3%
Total	**150**	**100.0%**

Table 2: Distribution among the cases with respect to age.

Age (in years)	Number	Percentage
<= 25	5	3.3%
26 to 30	24	16.0%
31 to 35	36	24.0%
36 to 40	35	23.3%
41 to 45	27	18.0%
46 to 50	17	11.3%
> 50	6	4.0%
Total	**150**	**100.0%**

As Table 3 shows that 68% cases receiving the ART treatment. It was seen from Table 4 that 68% patients included in the study were on first-line ART out of which majority of patients were on ZLN(38.2%) followed by SLN (35.3%), ZL + E (15.7%), SL + E (4.9%), TL + E (2%), TLN (2.0%), ZL (2%) and remaining 32% were not on ART. HIV-infected patients on fixed-dose combinations of HAART.

Table 3: Distribution among the cases receiving ART.

Patient receiving ART	Number	Percentage
Yes	102	68.0%
No	48	32.0%
Total	**150**	**100.0%**

Table 4: Distribution among the cases of percentage of patients on various ART Regimens.

ART Regimen	Number	Percentage
ZLN	39	38.2%
SLN	36	35.3%
ZL + E	16	15.7%
SL + E	5	4.9%
TL + E	2	2.0%
TLN	2	2.0%
ZL+ LPV/r	2	2.0%
Total	**102**	**100.0%**

ZLN – zidovudine + lamivudine + nevirapine; SLN – stavudine + lamivudine + nevirapine; ZL + E – zidovudine + lamivudine + efavirenz; SL + E – stavudine + lamivudine + efavirenz; TL + E – tenofovir + lamivudine + efavirenz; TLN – tenofovir + lamivudine + nevirapine; ZL + LPV/r- zidovudine +lamivudine + lopinavir/ritonavir(LPV)*

As seen from Table 5 that the maximum number of patients studied were in clinical stage 2 (48.0%) followed

by clinical stage 3 (38.0%), clinical stage 4 (8.7%) and only 5.3% of cases were in stage 1 respectively. As seen from Table 6 that CD4 count was less than 50/microL in 5.3%, 35.3% of cases had CD4 count between 50 to 199/microL, 42.0% had CD4 count between 200-499/microL while 17.3% % had CD4 count ≥500. It was seen from Table 7 that tuberculosis was the most common opportunistic infection observed in most patients with retroviral disease (RVD) with HIV infection/AIDS as seen in the above table. The other opportunistic infections (OIs) observed were toxoplasmosis (2 cases), and cryptococcal meningitis (2 cases) and one case of stavudine induced lipoatrophy in our study.

Table 5: Distribution among the cases with respect to clinical stage.

Clinical stage	Number	Percentage
I	8	5.3%
II	72	48.0%
III	57	38.0%
IV	13	8.7%
Total	**150**	**100.0%**

Table 6: Distribution among the cases with respect to CD4 counts.

CD4 (counts/microL)	Number	Percentage
< 50	8	5.3%
50 to 199	53	35.3%
200 to 499	63	42.0%
>499	26	17.3%
Total	**150**	**100.0%**

Table 7: Distribution among the cases with respect to diagnosis.

Diagnosis	Number	Percentage
RVD	54	36.0%
RVD with anemia	39	26.0%
RVD with abdominal TB	18	12.0%
RVD with PTB	14	9.3%
RVD with anaemia with PTB	10	6.7%
RVD with TBM	8	5.3%
RVD with CNS toxoplasmosis	2	1.3%
RVD with cryptococcal meningitis	2	1.3%
RVD with disseminated TB	2	1.3%
RVD with stavudine induced lipoatrophy	1	0.7%
Total	**150**	**100.0%**

X-ray abnormalities were seen in 81.3% patients as shown in Table 8, out of which most common X-ray

Abnormalities were PTB+ (suggest Patients with X-ray suggestive of infiltrative shadows diagnosed as pulmonary tuberculosis) which was 10.7%, cardiomegaly was seen in 6.7%, miliary shadows seen in 1.3%.

Table 8: Distribution among the cases with respect to X-ray abnormalities.

X-ray	Number	Percentage
Cardiomegaly	10	6.7%
PTB+*	16	10.7%
Miliary Shadows	2	1.3%
WNL#	122	81.3%
Total	**150**	**100.0%**

PTB+* suggest Patients with X-ray suggestive of infiltrative shadows diagnosed as pulmonary tuberculosis. WNL# – stands for within normal limits.

As seen from Table 9 that ECG abnormalities were seen in 42.67% patients while 57.3% patients had ECG within normal limits (WNL) with no significant findings. The most common ECG abnormality was sinus tachycardia 22.7%, followed by low voltage complexes 11.3%, ST-T changes 8.7%.

Table 9: Distribution among the cases with respect to ECG abnormalities.

ECG	Number	Percentage
Sinus tachycardia	34	22.7%
Low voltage complexes	17	11.3%
ST-T Changes	13	8.7%
WNL	86	57.3%
Total	**150**	**100.0%**

As Table 10 shows that when ECG was carried out in different CD4 category patients, it was found that the maximum % of abnormal ECG was found in CD4 <50 category i.e. 87.5% and least abnormal ECG findings were seen in CD4 >499 category patients i.e. 15.4%.When these ECG findings were compared with different CD4 categories and analyzed statistically by chi-square test for independence it was found significant (P <0.0001) which means there is high propensity of abnormal ECG findings as the CD4 count decreases in HIV patients.

From Table 11, Echocardiographic abnormalities were seen in 91.3% of cases. pulmonary artery hypertension was noted in 88% of cases, diastolic dysfunction was noted in 55.3%, reduced EF (LVEF<60%) was seen in 16.7% cases, LV systolic dysfunction was noted in 16% cases, pericardial effusions was seen in 14.3% while regional wall motion abnormalities (RWMA) seen in 12.7%, left atrial enlargement seen in 6% patients and dilated cardiomyopathy seen in 5.3% patients.

Table 10: Comparison of CD4 categories with ECG findings in patients of HIV with respect to ECG findings (n=150).

CD4 count category	No. of patients	ECG Abnormalities in patients	
		Normal	Abnormal
<50	8 (5.3%)	1 (12.5%)	7 (87.5%)
50-199	53 (35.3%)	30 (45.6%)	23 (43.4%)
200-499	63 (42%)	50 (79.4%)	13 (20.6%)
>499	26 (17.3%)	22 (84.6%)	4 (15.4%)
Total	**150**		

p-value = 0.001

Table 11: Showing distribution of echocardiographic abnormalities.

2D-ECHO Finding	Number	Percentage
Reduced LVEF (<60%)	25	16.7%
Pulmonary hypertension	132	88.0%
Pericardial effusion	17	11.3%
LV systolic dysfunction	24	16.0%
Diastolic dysfunction	83	55.3%
Wall abnormality	19	12.7%
Dilated cardiomyopathy	8	5.3%
Left atrial enlargement	9	6.0%

As shown in Table 12 that there was statistically significant association between each echocardiographic abnormality when compared to different groups of CD4 counts and it was observed that the propensity of those echocardiographic abnormalities increased towards groups with CD4 counts less than 200/microL.

DISCUSSION

Although the clinical presentation of HIV is still dominated by opportunistic infections, it is still increasingly common for HIV/AIDS patients to be seen by cardiologists and cardiovascular disease in HIV/AIDS is becoming increasingly recognized in the developing world. Despite this, heart disease can be overlooked in HIV-positive patients, because symptoms of breathlessness, fatigue and poor exercise tolerance are frequently ascribed to other conditions associated with HIV infection. Cardiac complications of HIV infection tend to occur late in the disease or are associated with related therapies and are therefore becoming more prevalent as therapy and longevity improve. Antiretroviral drug therapies for HIV infection have sustained life but may increase cardiovascular (CV) risk and accelerate atherosclerotic risk.

Gender distribution of patients studied

One hundred and fifty HIV patients, registered at ART centre of tertiary hospital were taken into study. Men

were more affected than females by a ratio of 1.4:1. About 86 (57.3%) were males and 64 (42.7%) were females. The gender difference was also at par with

NACO report, where 39% of the total HIV patients in India were females, 3.5% were children and the rest 57.5% were males.[3]

Table 12: Comparison of CD4 count categories with different echo findings in the patients of HIV (n=150).

CD4 counts (per microL)	No. of patients	ECHO abnormalities---------→		LVEF	PAH	PE	SD	DD	RWMA	DCMP	LAE
<50	8	N	No.	1	0	4	2	0	4	4	4
			%	13%	0%	50%	25%	0%	50%	50%	50%
		Ab	No.	7	8	4	6	8	4	4	4
			%	88%	100%	50%	75%	100%	50%	50%	50%
50-199	53	N	No.	37	2	40	37	38	40	48	49
			%	70%	4%	76%	70%	72%	76%	91%	93%
		Ab	No.	16	51	13	16	15	13	5	4
			%	30%	96%	25%	30%	28%	25%	9%	8%
200-499	63	N	No.	62	12	63	62	35	62	63	63
			%	98%	19%	100%	98%	56%	98%	100%	100%
		Ab	No.	1	51	0	1	28	1	0	0
			%	2%	81%	0%	2%	44%	2%	0%	0%
>499	26	N	No.	25	4	26	25	14	25	26	26
			%	96%	15%	100%	96%	54%	96%	100%	100%
		Ab	No.	1	22	0	1	12	1	0	0
			%	4%	85%	0%	4%	46%	4%	0%	0%
Total	150										
p-value#				<0.0001	0.012	<0.0001	<0.0001	0.008	<0.0001	0.002	0.001

N = Normal, Ab = Abnormal; here LVEF<60% and presence of PAH, PE, SD, DD, RWMA, DCMP and LAE is considered abnormal; # - P value when individual parameters were compared with different CD4 count categories which are calculated using Peason's chi-square test; as the number of patients in the two groups i.e CD4<50/microL and CD4 between 50-199 /microL were less these two groups were pooled while applying Pearson's chi-square tests; p value <0.05 which is considered to be significant.

Age distribution of patients studied

The age of the patients studied ranged between 19 and 64 years, with a mean age of 37.69($\pm$7.81) with mean age of 37.71 ($\pm$7.83) years in males and 36.8 ($\pm$7.43) years in females respectively.

In this study, 96% of the patients are in the age group of 19-49 years and only 4% are above 50 years of age. This is similar NACO report in which 89% are in the age group of 15-49 years and 7% are above 50 years and is also comparable with the age distribution in another large study done in India by Kumaraswamy et al.[3,5]

The increasing percentage of women on ART is probably an outcome of increasing awareness among women, routine antenatal screening, screening of spouses of men diagnosed with HIV disease and the availability of free drugs through the government ART centres. Sexual contact was the most common mode of transmission with heterosexuality being the cause for most of them and our data is comparable with NACO annual report 2009-10 where heterosexual route of transmission was the most common.[6]

Clinical features in relevance cardiovascular system

The clinical features of the patients under study with relevance to cardiovascular system were breathlessness (52.7%), fever (44.0%), chest pain (24.0%), palpitations (20%) and pedal edema (13.3%) respectively was similar to as reported in another study from India by Anita However, most of the symptoms were nonspecific and could be attributable to secondary pulmonary infections.[7]

Distribution of cases by WHO clinical staging

The maximum number of patients studied were in clinical stage 2 (48.0%) followed by clinical stage 3 (38.0%), clinical stage 4 (8.7%) and only 5.3% of cases were in Stage 1 respectively. While in study conducted by Singh et al most patients studied belonged to stage 3(45%) and stage 4(35.7%) categorized under WHO revised criteria.[8,9] This difference in observation was because in our study we recruited patients both following up in the out-patient department as well as admitted patients while in the above mentioned study most of the patients were admitted patients and presented only in the advanced stages of the disease at the time of diagnosis.

CD4 count distribution studied

CD4 count was less than 50/microL in 5.3%, 35.3% of cases had CD4 count between 50 to 199/microL, 42.0% had CD4 count between 200-499/microL while 17.3% had CD4 count ≥ 500. The Mean CD in patients having abnormal 2D-echo finding was 301.98±215.01 while for those with no 2D-echo finding was 388.23±190.06. CD4 count was less than 50/microL in 5.3%, 35.3% of cases had CD4 count between 50 to 199/microL, 42% had CD4 count between 200-499/microL while 17.3% had CD4 count ≥500.

X-Ray and ECG abnormalities studied

X-Ray abnormalities were seen in 81.3% patients out of which most common X-ray abnormalities were PTB+ (suggest patients with X-Ray suggestive of infiltrative shadows diagnosed as pulmonary tuberculosis) which was 10.7%, cardiomegaly was seen in 6.7%, miliary shadows seen in 1.3%. In a study done by Anita, 36% patients had cardiomegaly, 8% had PTB.[7]

ECG abnormalities were seen in 42.67% patients while 57.3% patients had ECG within normal limits (WNL) with no significant findings. The most common ECG abnormality was sinus tachycardia 22.7%, followed by low voltage complexes 11.3%, ST-T changes 8.7% whereas in an Indian study done by Anita sinus tachycardia was seen in 72% patients, low voltage complexes in 10% patients and ST-T changes in 6% patients.[7]

Similarly in a western study done by Heidenreich et al 38% patients had sinus tachycardia, 7.2% patients had low voltage complexes and 6% had ST-T changes.[10] During comparison of CD4 categories with ECG findings in patients of HIV with respect to ECG findings and its was observed that the percentage of abnormal findings was higher amongst the groups with lower CD4 counts which was statistically significant.

Cardiac involvement and HIV

The exact prevalence of cardiac involvement in HIV/AIDS is uncertain, and it varies from 28% to 73% depending on the screening methods selected, the population studied, and the definition of cardiac abnormality.[11] Echocardiographic abnormalities were seen in 91.3% of cases. Pulmonary artery hypertension was noted in 88% of cases, diastolic dysfunction was noted in 55.3%, reduced EF (<60%) was seen in 16.7% cases, LV systolic dysfunction was noted in 16% cases, pericardial effusion was seen in 14.3% while RWMA seen in 12.7%, left atrial enlargement seen in 6% patients and dilated cardiomyopathy seen in 5.3% patients.

In this study the prevalence of reduced LVEF (<60%) was 16.7% as compared to 48.7% in a study done by Ayaskanta et al and 32% in a western study done by

Reinsch et al.[8,12] The prevalence of pericardial effusion was 11.3% in our study as compared to 17.4% in the Indian study.[8] Diastolic dysfunction was seen in 55.3% cases in our study which is comparable to the western study done by Reinsch et al which was 48%. RWMA was seen in 12.7% patients in our study which is comparable to the western study which in which 13.5% cases had RWMA.[12] Dilated cardiomyopathy DCMP was seen in 5.3% cases in our study which was comparable to 8.5% cases as seen in the western study.[12]

Diastolic dysfunction is characterized by elevated LV end-diastolic pressure despite normal or subnormal diastolic volume. In a prospective study by Nayak et al on 91 HIV-positive cohort, diastolic dysfunction on echocardiography was reported in 37% (95% confidence interval [CI] 27.4-48.1).[13] Dilated cardiomyopathy has been associated with advanced immunosuppression and lower CD4 counts, and it is an independent risk factor for death.[9]

Patients with HIV infections have been shown to have an increased risk of coronary artery disease, and the most likely mechanism is endothelial dysfunction. Other underlying causes may be abnormal lipid metabolism, lipodystrophy syndrome, insulin resistance, and impaired glucose metabolism.

The pathogenesis of PAH is not clearly known but can be multifactorial.[14] HIV may cause endothelial damage and mediator-related vasoconstriction through stimulation by the envelope glycoprotein 120, including direct release and pulmonary vasoconstrictor effects ofendothelin-1 (ET-1), interleukin 6 (IL-6), and tumor necrosis factor-a (TNF-a). HIV is frequently identified in alveolar macrophages on histology.

These macrophages release TNF-a, oxide anions, and proteolytic enzymes in response to infection. Effects of ART on pulmonary artery endothelial cell are unknown. There was a high prevalence of pulmonary hypertension in our study as compared to other studies (88% of patients in our study) as compared to other studies.

Most cases of pulmonary hypertension are probably not due to primary myocardial disease from HIV but rather due to secondary changes in the pulmonary circulation from recurrent bronchopneumonia, HIV-induced pulmonary arteritis and pulmonary tuberculosis which are common in HIV patients. As also in our studies most of our patients had tuberculosis as the commonest OI and also we had not recruited patients with pre-existing illnesses which are known to cause cardiovascular manifestations (PAH) like chronic obstructive airway disease, ischaemic heart disease diabetes mellitus and hypertension.

The mechanism for HIV-associated myocardial pathogenesis remains unclear. A variety of potential etiologies have been postulated in HIV-related heart

disease.[15] They are myocardial damage with HIV itself, opportunistic infections, drug-related cardiotoxicity, nutritional deficiencies, autoimmune responses, and prolonged immunosuppression. It has been reported that HIV virions appear to infect the myocardial tissue in patchy distributions.[8]

The differential diagnosis of diastolic dysfunction in HIV/AIDS includes LV dysfunction secondary to ischemic heart disease, diabetes or hypertension, hypersensitivity reactions to drugs or foreign material, and coronary spasm from cocaine use.

In this study, high prevalence of diastolic dysfunction seen can partially be contributed to HIV itself, opportunistic infections, drug-related cardiotoxicity, nutritional deficiencies, autoimmune responses, and prolonged immune suppression as we had excluded patients having diabetes, hypertension and similar medical conditions known to cause cardiovascular morbidity. Reduction in LVEF was seen in 16.7% as compared to 22.8% in an Indian study of cases in the present study.[8] Reduction in ejection fraction without global hypokinesia or chamber enlargement but without any symptom probably represented a mild form of cardiac disease that will progress to a clinically evident form of dilated cardiomyopathy.

Since regional LV dysfunction may be the earliest stage of subsequent global LV dysfunction, the identification of this early stage is of critical importance in the management of HIV-associated myocardial disease. Previous studies have shown that HIV related cardiac manifestations are often seen in a state of severe immuno suppression with low CD4 count (CD4 <200/microL).[8] This study showed that patients with CD4 count less than 200/microL had a high prevalence of echocardiographic abnormalities than those with CD4 count more than 200/microL which was statistically significant. It was also seen that pulmonary hypertension and diastolic dysfunction was seen amongst all CD4 groups and it can be said that these two cardiac manifestations are not related to the immunosuppression caused by HIV.

In various studies the exact prevalence of cardiac involvement in patients with HIV/AIDS varies depending on screening method and population studies. In our study we observed that various echocardiographic abnormalities are not infrequent. Echocardiography can be a useful technique for the early recognition and treatment of cardiac dysfunction in such patients

CONCLUSION

The results of our study indicate that cardiovascular abnormalities in HIV infected patients are common. The most common cardiac manifestations being pulmonary hypertension, diastolic dysfunction, reduced LVEF (%), LV systolic dysfunction, pericardial effusions, RWMA, DCMP and left atrial enlargement. Echocardiographic abnormalities increase with advanced stages of HIV infection as indicated by low CD4+ T cell counts.

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