

Research Article**Evaluation of ECG Abnormalities in HIV Infected Patients in Urban Part of South India****V. Sakthivadivel¹, T. Archana Gaur²**¹Assistant professor, Department of Medicine, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research, Melmaruvathur, Tamilnadu, India²Assistant professor, Department of Physiology, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research, Melmaruvathur, Tamilnadu, India***Corresponding author**

Dr. V. Sakthivadivel

Email: vsakthivadivel28@gmail.com

Abstract: Acquired Immuno Deficiency Syndrome was first recognized in the United States in 1981. In 1983, Human Immuno Deficiency Virus was isolated and in 1984 it was demonstrated clearly to be the causative agent of AIDS. India's first case of AIDS was reported in 1986 from Chennai. From the beginning of the AIDS epidemic, it was recognized first at autopsy and later by non-invasive techniques that HIV infection can cause cardiac abnormalities. The aim of the study is To assess electrocardiogram (ECG) changes in HIV infected individuals. A total of 200 patients were randomly chosen from the Anti-Retro viral Therapy clinic. After excluding fifty patients, Remaining 150 patients were divided into two groups depending on the CD4 count. Group I included patients with CD4 count ≤ 350 cells / mm³. Group II included patients with CD4 count > 350 cells / mm³. All patients were subjected to a questionnaire to assess the risks of acquiring HIV, risk factors for cardiac disease and symptomatology of cardiac illness. A thorough clinical examination of the cardiovascular system, respiratory system, abdomen and central nervous system was done. CD4 count, ECG was done for all patients. Prevalence of ECG abnormalities was 14.7% in our study. Low voltage complex was the most common electrocardiographic abnormality. ECG abnormalities were specifically correlated with CD4 counts. In this study 14 out of 51 patients with CD4 counts ≤ 350 /mm³ and 8 out of 99 patients with CD4 counts of > 350 /mm³ had ECG abnormalities. Present study recommends screening for cardiac abnormalities in HIV patients to identify early cardiac involvement and minimize cardiac complications by early intervention.

Keywords: HIV infection, Cardiac abnormality, ECG.

INTRODUCTION:

Acquired Immuno Deficiency Syndrome was first recognized in the United States in 1981 when the U.S Center for Disease Control and prevention (CDC) reported unexplained occurrence of Pneumocystis jiroveci pneumonia in five previously healthy homosexual men. In 1983, Human Immuno Deficiency Virus was isolated from a patient with lymphadenopathy and in 1984 it was demonstrated clearly to be the causative agent of AIDS[1]. India's first case of AIDS was reported in 1986 from Chennai [2]. Before the advent of Anti-retroviral therapy (ART), clinically significant cardiac disease was universal in the HIV infected population and was detected in most cases only at autopsy. In fact when HIV infected patients were examined by echocardiography in late 1990, cardiac abnormalities were detected more often than could be expected from clinical symptoms and physical examination[3]. Pericardial effusion and Myocarditis are among the most commonly reported abnormalities though cardiomyopathy, endocarditis and coronary vasculopathy have also been reported. It is

expected that the risk of cardiac and cardiovascular disease will rise in the following years due to the cardiovascular risk profile and increased life expectancy of infected patients. Therefore diagnosis and therapy of HIV associated cardiovascular diseases should be an inherent part of current therapeutic concepts of HIV infection[3].

MATERIALS AND METHODS

The study was conducted in January 2008 to June 2008 in the Department of Medicine, Kilpauk Medical College and Hospital. Another Collaborating Department – ART Centre, Department of Cardiology, Kilpauk Medical College and Hospital. A total of 200 patients were randomly chosen at the start of the study. Fifty patients were excluded from study because of exclusion criteria. Among the 150 patients 62 males and 88 females in the study group. They Were divided into two groups depending on the CD4 count. Group I included patients with CD4 count ≤ 350 cells / mm³. Group II included patients with CD4 count > 350 cells / mm³. Because majority of the individuals in South

Indian populations with CD4 counts of 200 - 350 cells / mm³ have high viral load than North Indian and Western counter parts [4].

Inclusion Criteria

1. Patients who have been diagnosed as HIV positive by ELISA method

Exclusion Criteria

1. Age less than 18 years and more than 55 years
2. Treatment with anti-retroviral drugs or any cardio toxic drugs
3. Diabetes
4. Hypertension
5. Previous congenital or acquired heart disease
6. Neoplastic diseases
7. Family history of cardiovascular diseases
8. Patients having lipid profile abnormalities.

Clinical Examination Focused In The Study:

All patients were meticulously examined for the presence of anemia, cyanosis, clubbing, pedal edema, dyspnea, jaundice, generalized

lymphadenopathy and skin and mucous membrane lesions. Respiratory rate, pulse rate, jugular venous pressure, blood pressure (both in supine and erect posture) were also recorded. A thorough clinical examination of the cardiovascular system, respiratory system, abdomen and central nervous system was done.

Laboratory Investigations

(CD4 Count Assay)The standard method for enumerating CD4 T cells, a flow cytometer was used. Computer calculates the number of CD4 T cells by analyzing the size of the cell and which of the antibodies it has been tagged with. The overall process is called Fluorescence Activated Cell Sorting (FACS).A standard 12 lead resting electrocardiograms was taken for all individuals in this study.

Statistical Analysis:

Statistical analysis was done by using windows SPSS software (version 11.5). Chi square test was applied for significance. ‘P’value less than 0.05 was considered as significant.

RESULTS

Table-1: Shows the groups of HIV patients based on CD4 cell count

CD4 GROUP	NUMBER OF PATIENTS	CD4COUNT CELLS/mm ³	MEAN CD4 COUNT CELLS/mm ³
I	51	≤350	261.08±83.75
II	99	>350	582.69±191.24
TOTAL	150		473.34±223.20

Legend: 1 A total of 150 HIV seropositive patients were studied. They were divided into two groups. Group I included 51 HIV seropositive patients with CD4 cell count ≤ 350 cells / mm³ (n=51).Group II included 99 HIV seropositive patients, with CD4 count > 350 cells / mm³ (n=99).Mean CD4 count of study population was 473.34 ± 223.20 cells / mm³ (Group I - 261.08 ± 83.75 cells / mm³; Group II was 582.69 ± 191.24 cells / mm³). Out of 150 patients, 62 (41.3%) were males (Group I - 30; Group II - 32) and 88 (58.7%) were females (Group I – 21; Group II – 67).Mean age of study group was 30.87 ± 6.11 years (Group I - 31.43 ± 6.23 years; Group II - 30.58 ± 6.06 years)

Table-2: Shows Analysis of Electrocardiogram Among The HIV Population

ECG ABNORMALITIES	CD4 Group I	CD4 Group II	TOTAL
SINUS TACHYCARDIA	1 (4.54%)	1 (4.54%)	2 (9.09%)
CONDUCTION ABNORMALITIES	-	2 (RBBB) (9.09%)	2 (9.09%)
ATRIAL ECTOPIC	1 (4.54%)	2 (9.09%)	3 (13.64%)
VENTRICULAR ECTOPIC	2 (9.09%)	-	2 (9.09%)
POOR PROGRESSION OF R WAVE	3 (13.64%)	1 (4.54%)	4 (18.18%)
LOW VOLTAGE	5 (22.73%)	1 (4.54%)	6 (27.27%)
ST/T WAVE ABNORMALITY	2 (9.09%)	1 (4.54%)	3 (13.64%)
Total	14 (63.64%)	8 (36.36%)	22 (100%)

Legend: 2 Out of 150 patients 22 patients had ECG abnormalities. Variations in ECG were observed based on the CD4 cell count.

Table-3: Shows Electrocardiographic Changes In Relation To CD4 Count

ELECTROCARDIOGRAPHY	CD4 GROUP I	CD4 GROUP II	TOTAL
NORMAL	37 (24.7%)	91 (60.7%)	128 (85.3%)
ABNORMAL	14 (9.3%)	8 (5.3%)	22 (14.7%)
TOTAL	51 (34%)	99 (66%)	150 (100%)

Legend: 3 There was statistically significant difference noted between two groups regarding electrocardiographic abnormalities ($P < 0.05$). Prevalence of electrocardiographic abnormalities increased with decline in CD4 count.

DISCUSSION

Cardiovascular manifestations of HIV infection have not attracted much attention in the Indian sub-continent. This is partly because of the clinical picture of HIV infection still dominated by opportunistic infections and symptoms of breathlessness, fatigue and poor exercise intolerance are frequently ascribed to other conditions associated with HIV infection[5]. With the greater access to Anti-retroviral medications more patients may live longer enough to present with end organ disorders. Our study throws light into various unsuspected cardiac abnormalities in various groups of HIV infected patients and its relationship to CD4 count. Electrocardiographic abnormalities were seen in 22 patients (14.7%). In Group I, among 51 patients, 14 patients had ECG abnormalities. In Group II, 8 patients had ECG abnormalities. The ECG abnormalities observed were low voltage complexes (27.27%), poor progression of R wave (18.18%), nonspecific ST-T changes (13.64%), atrial ectopic (13.64%), right bundle branch block (9.09%), sinus tachycardia (9.09%) and ventricular ectopic (9.09%). There was a significant association between CD4 count and ECG abnormalities (P value was 0.000). Herdy GV *et al.* In 1994 they conducted an on ECG changes in HIV patients out of 50 patients 18 patients had sinus tachycardia, 10 patients had ST-T changes, 5 patients had low voltage complexes, 5 patients had ST segment elevation and 3 patients had extra systole [6]. Another study conducted by Mirri A *et al* in 1990 was analysed ECG abnormalities unrelated to echocardiographic abnormalities or clinical problems were seen in 11 patients[7]. S Mishra *et al* conducted a study among 74 patients; there results showed that 20.27% had ECG abnormalities in the HIV population[8].

CONCLUSION

The determination of Incidence and Prevalence of ECG abnormalities in HIV infected individuals using ECG is quite feasible and should be done in all patients registering in ART Centre. There

was an inverse relation between CD4 count and ECG abnormalities. Decline in CD4 count below 350 cells / mm^3 was associated with increased incidence of ECG abnormalities.

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