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PREVALENCE OF DYSLIPIDEMIA AMONG HIV PATIENTS RECEIVING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY : A CROSS-SECTIONAL STUDY

General Medicine

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ABSTRACT

BACKGROUND:. Patients receiving ART combinations are reported lipid profile changes as an independent risk factor for adverse outcomes, including cardiovascular-related events, reduced life expectancy and increased use of medical resources, which increase healthcare costs of the disease and reduce the patients quality of life of affecting with HIV infection.

AIM: To determine prevalence and characteristics of dyslipidemia among HIV patients receiving highly active antiretroviral therapy.

Material and methodology: This cross sectional study was conducted in ART centreattached with Jhalawar Medical College, Jhalawar, a tertiary care center in south-east Rajasthan from January 2020 to June 2021. Study included all the patients aged above 18 years on HAART therapy. Calculated sample size was 115 and patients were recruited by simple random sampling technique. Data were analysed in SPSS 21. Independent t-test and Chi-square test were applied. P value <0.05 was considered statistically significant.

Results: Current study revealed that out of 115 patients 75 were male rest were female. Prevalence of dyslipidaemia in patients was found be 35.7% at 3 months and prevalence of dyslipidemia was found to be 55.7% at 6 months. A statistically significant high Total cholesterol, Triglyceride and LDL were found among dyslipidaemia patients.

CONCLUSION: The use of first-line antiviral medication was linked to higher total cholesterol, LDL-cholesterol, and triglycerides, all of which are known to be atherogenic lipid profiles. As a result, we urge that lipid profiles be conducted at baseline before starting antiretroviral medication and then periodically thereafter treatment on a regular basis follow-up to keep an eye on any emerging tendencies.

KEYWORDS

HAART, LDL, VLDL, HDL HIV.

INTRODUCTION

HIV infection causes a variety of symptoms in the body, some of which are clinically visible and others which are biochemically visible. One of the metabolic abnormalities identified in HIV infection is dyslipidemia.[1-3] Dyslipidemia has its own set of complications, which might exacerbate pre-existing conditions. Dyslipidemia can hasten the progression of the condition. As a result, determining whether dyslipidemia exists in a specific situation has become critical.[4]

Assessment and early detection of these lipid changes is therefore critical during ART use in order to facilitate the use of intervention strategies (diet and lifestyle changes, treatment switching, and pharmacotherapy) and to avoid adverse outcomes related to dyslipidaemia and preserve life expectancy among HIV patients.[5]

There are few statistics on the prevalence of dyslipidaemia among HIV patients on antiretroviral therapy (ART) in India[6-8], and little is known about the factors that contribute to alterations in HIV patients' lipid profiles. These findings are particularly important for the prevention, early diagnosis, and rapid management of cardiovascular disease risk in HIV treatment and care programmes. As a result, the goal of this study was to determine the frequency of dyslipidaemia, its features, and factors linked to lipid levels among HIV-infected patients receiving highly active antiretroviral therapy in Rajasthan, India.

MATERIALS AND METHODS:

A cross-sectional observational study was conducted from February 2020 to December 2021 in theAntiretroviral therapy (ART) centre attached with Jhalawar Medical College, Jhalawar, a tertiary care center in south-east Rajasthan. The study was conducted on a scientifically calculated sample size of 104 participants with a power of 80% and alpha error of 0.05. Consecutive sampling of 115 patients withreceiving recently highly active antiretroviral therapy at ART centre of SRG hospital during study period, were enrolled after obtaining written informed consent for participation in the study. Patients with already diagnosed dyslipidemia, cases associated with renal disease, thyroid disorders, history and presence of jaundice, chronic liver disease, diabetes mellitus, familial hyperlipidemia (history wise), patients under therapy with lipid lowering drugs or other drugs known to alter lipid profile, seriously ill patients (Severe systemic disease or condition, bed ridden or comatose patients, psychiatric illness etc) and BMI >30 were excluded from the study.

Study tools and procedure:

all the study participants were explained in detail about the purpose and methodology of the study, potential risk and benefit. Procedure of maintaining confidentiality and right about not to participate in this study was provided to them.

Thereafter, the participant information sheet was explained to each participants and written consent was obtained. Selected patients were undergone through detail history (socio-demographic profile, disease history, occupation, addictions and dietary history etc) and thorough clinical examination (general and systemic examination, anthropometry, vitals etc.) under the supervision of experience faculties. They were subjected to laboratory evaluation for routine and special investigation like lipid profile. Treatment details of individuals was recorded from their ART card. All the information were reported in individual case proforma.

Laboratory data were collected at the start of the study, as well as three and six months after HAART was started. TC was determined using an enzymatic approach (cholesterol esterase, cholesterol oxidase, and peroxidase), HDL was determined using a precipitation (end point) method, and TG was determined using an enzymatic method (Glycerol phosphate oxidase and peroxidase; Endpoint). The indirect Friedewald equation was used to determine LDL levels.[9] Finally, any of the following- a) total cholesterol > 200 mg/dl, b) HDL-C 40 mg/dl, c) LDL-C > 130 mg/dl and d) triglycerides > 150 mg/dl were categorised as dyslipidemia as per US National Cholesterol Education Program, Adult Treatment Panel (NCEP- ATP) III guidelines.

Data analysis was done using licensed SPSS software version 21.0 (Chicago, Illinois). Paired t-test and ANOVA test were used to compare the continuous variable and chi-square test was used for categorical variables. A p-value <0.05 was considered as statistically significant.

RESULTS:

In the present study a total 115 participants were followed till 6 months. Mean age of study participants was 40.4± 11.4 years and maximum were in age group of 31-50 years (57.2%), male were 55.7%, maximum were on TLE (35.7%) therapy. (Table 1)

In our study, mean baseline TG, TC, LDL and HDL were in normal

range but these were significantly (p<0.001) elevated except HDL (significantly decline) from baseline to 3 months and 6 months and maximum were found at 6 months of treatment. (Table 2). In our study the prevalence of dyslipidaemia at 3 months and 6 months was found to be 35.7% and 55.7% respectively. (Figure 1)

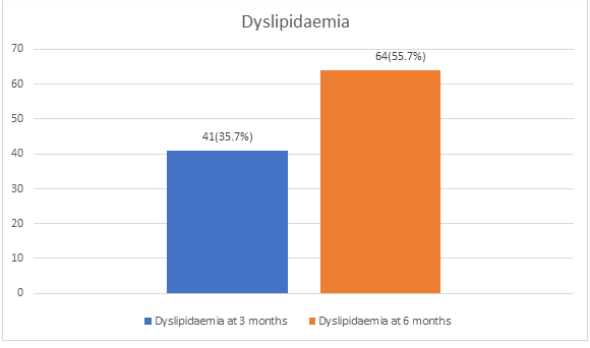
Table 1. Patients Characteristics (N=115):

AGR GROUP	NUMBERS	PERCENT
18-30 years	26	22.6
31-40 years	31	27.0
41-50 years	37	32.2
>50 years	21	18.3
Gender		
Female	51	44.3
Male	64	55.7
ART		
ZLN	28	24.3
ZLE	31	27.0
TLN	15	13.0
TLE	41	35.7
CD-4 count:		
<50	18	15.7
51-200	73	63.5
>200	24	20.9

Table 2: Lipid profile of study participants:

Parameter	Baseline	At 3 months	At 6 months	p-value (Anova test)	p value (b/w baseline and at 3 months)	p value (b/w baseline and at 6 months)
TC (mg/dl)	165.28±2.3	201.88±12.6	215.32±22.6	0.0001	0.0001	0.0001
TG (mg/dl)	128.0±5.9	152.2±10.7	159.9±14.7	0.0001	0.0001	0.0001
LDL (mg/dl)	106.1±5.3	132.4±5.2	144.2±14.6	0.0001	0.0001	0.0001
HDL (mg/dl)	43.2±8.3	38.3±2.8	36.3±1.9	0.0001	0.0001	0.0001

Figure 1: Prevalence of dyslipidaemia



DISCUSSION:

This hospital based prospective cross sectional study was conducted in Antiretroviral therapy (ART)centreattached with Jhalawar Medical College, Jhalawar, a tertiary care center in south-east Rajasthan and designed to find out the prevalence and characteristics of dyslipidemia among HIV patients receiving highly active antiretroviral therapy.

In the present study, TG, TC, LDL and HDL were in normal range but these were significantly (p<0.001) elevated except HDL (significantly decline) from baseline to 3 months and 6 months. Some other studies have also identified similar changes with an increase in mean TC,TG, and LDL-C levels at 3 months and a further increase at 6 months with a statistically highly significant P value(0.001).[6-8,10-14]

In contrast to these research by Nayyar AS et al revealed that total cholesterol, LDLs, triglycerides, and VLDLs were considerably altered in HIV-infected and AIDS patients. In the case of only in triglycerides a statistically significant difference was found between the control and cases.[15]

In the present study the prevalence of dyslipidaemia at 3 months and 6 months was found to be 35.7% and 55.7% respectively. Similarly in patients on HIV treatment were reported 19.4% to 69.4%.[6,11,16-17]

Increased levels of low-density lipoprotein cholesterol (LDL-c), serum total cholesterol (TC), and triglycerides (TG) are related with ART usage, as is a reduction in high-density lipoprotein cholesterol (HDL-c). These changes in lipid levels appear soon after starting ART and are linked to an increased risk of cardiovascular disease, as well as other morbidities and mortality. Patients receiving ART combinations have also reported lipid profile changes as an independent risk factor for adverse outcomes, such as cardiovascular-related events, decreased life expectancy, and increased use of medical resources, all of which increase disease-related healthcare costs and lower patients' quality of life.[18]

CONCLUSION:

We concluded that by monitoring lipid parameters in HIV patients starting HAART, it is preferable to start with lipid-friendly medications if there is associated dyslipidemia. Patients with dyslipidemia who are already on HAART can be moved to lipid-friendly regimens or lipid-lowering therapies can be added. As a result, we can prevent cardiac and cerebrovascular problems, improving the quality of life of patients who are already immunocompromised.

Limitation

The sample size was kept minimal because the study was single-centered and had a short time frame.

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Conflict of Interest

There is no financial conflict of interest to declare for any of the authors in association with the publication of this manuscript.

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Author Contributions

All authors had access to the study data. contributed to the study concept and design, data collection, data analysis and interpretation, and drafting of the manuscript. _____contributed to the data collection, data analysis and interpretation, and drafting of the manuscript. All authors reviewed and approved the final version of the manuscript before submission.

Supplementary Data No other supplementary data is available.

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