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Research Article

Prevalence of Liver Damage in Patients Under Antiretroviral Therapy at Gitwe District Hospital

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Abstract

Background: The emergence of liver diseases as one of the major causes of death in people infected with HIV has paralleled the introduction of more effective antiretroviral therapies. More than 60% of the prescribed drugs are cleared in the liver, and hepatic injury is the most frequent cause of drug discontinuation in clinical trials. Thus, it is not surprising that all ART drugs have some risk of hepatotoxicity, which varies depending on the specific characteristics of the drugs. Measuring liver enzymes is the most common way of determining hepatotoxicity. HIV and antiretroviral medications both cause abnormalities in liver enzymes. Antiretroviral (ARV) medications harm liver cells either directly or through their active metabolites

Objective: The aim of this study was to determine the prevalence of liver damage in patients exposed to antiretroviral therapy at Gitwe District Hospital.

Materials and methods: Retrospective study was conducted in 212 HIV patients attending GITWE District Hospital, Southern province, Rwanda from 2023-2024. Patients under HAART with valid liver function test results for alanine aminotransferase (ALT), aspartate aminotransferase (AST) were included.

Results: Among 212 patients included in the study, from 2023 to 2024, 24(11.32%) presented mild, moderate, and severe liver damage. Very few severe cases 4(1.9%) were observed, Normal female and male represented high percentage among the patients: 116(54.5%) and 72(34.0%) respectively.

Conclusions: Mild and moderate liver damage were present in HIV patients**;** Severe liver damage were rare 4(1.9%) in all patients but many of the patients showed normal liver function. The effort made by health care providers in regular monitoring of hepatotoxicity among HIV-infected patients and advising patient to moderate alcohol consumption must be supported in order to avoid severe liver damage and other health complications.

Keywords: HIV, antiretroviral Therapy, liver enzyme elevation, Prevalence

INTRODUCTION

The emergence of liver diseases as one of the major causes of death in people infected with HIV has paralleled the introduction of more effective antiretroviral therapies[1].

More than 60% of the prescribed drugs are cleared in the liver, and hepatic injury is the most frequent cause of drug discontinuation in clinical trials. Thus, it is not surprising that all ART drugs have some risk of hepatotoxicity, which varies depending on the specific characteristics of the drugs[2].

Measuring liver enzymes is the most common way of determining hepatotoxicity. HIV and antiretroviral medications both cause abnormalities in liver enzymes. Antiretroviral (ARV) medications harm liver cells either directly or through their active metabolites[3].

Typical mechanisms of liver disease include oxidative stress, mitochondrial injury, lipotoxicity, immune-mediated injury, cytotoxicity, toxic metabolite accumulation, gut microbial translocation, systemic inflammation, senescence and nodular regenerative hyperplasia[4].

Patients with HIV appear to have increased risk of hypersensitivity reactions when compared with the general population, possibly predisposing them to higher likelihood of Drug induced liver injury (DILI) from medications such as trimethoprim-sulfamethoxazole and

acyclovir. Additionally, drug–drug interactions seen in these patients who are typically burdened by polypharmacy may potentiate hepatotoxic effects of other agents[2]. HIV continues to spread rapidly and Sub-Saharan Africa is the hardest-hit region in the world, with more than two-thirds of all people living with HIV globally[5].

Patients on Nevirapine-containing regimens, for example, experienced liver damage and skin rashes[6]. Metabolic disorders: including excess weight, obesity and diabetes are significant causes of liver disease among people with HIV in lower and middle-income countries, while hepatitis B and C play a minimal role[7].

Aspartate aminotransferase (AST) is an enzyme found in several parts of the body, including: heart, brain, pancreas, liver and muscles. AST is an enzyme that helps the body break down amino acids. Like ALT, AST is usually present in blood at low levels. An increase in AST levels may mean liver damage, liver disease or muscle damage[8].

AST and ALT are the enzymes that are most commonly released into the bloodstream when the liver is stressed[9].

METHODS

Study site and target population

The study was conducted at Gitwe District Hospital, located in Ruhango District, Southern Province, Rwanda. The study population was 450 HIV patients attending Gitwe District Hospital exposed to ART. We collected the data from 2023 to 2024 using records of Gitwe District Hospital. Systematic random sampling was used to collect data of 212 patients. HIV/AIDS patients exposed on ART and tested for liver function using (alanine aminotransferase (ALT), and aspartate aminotransferase (AST) were included in this study.

Ethical Consideration

An official approval letter to conduct the study was provided by University of Gitwe and the permission to collect data was delivered by Research Committee of Gitwe District Hospital. We agreed to respect ethical rules and regulations.

RESULTS

Socio- demographic characteristics of participants

Table 1: Distribution of participants by gender

Gender	Frequency	Percent	Cumulative Percent
Male	80	37.7	37.7
Female	132	62.3	100.0
Total	212	100.0	

The table above showed the distribution of participants based on gender. Male were fewer 80 (37.7%) and female 132(62.3%).

Table 2: Distribution of participants by age

Age	Frequency	Percent	Cumulative Percent
<40	20	9.4	9.4
40+	192	90.6	100.0
Total	212	100.0	

The table above showed the distribution of patients based on age. Young patients below 40 years old were fewer 20(9.4%) than adult patients above or equal to 40 years old 192(90.6%).

Table 3: Distribution of patients by results of AST test

Level	of liver damage	Frequency	Percent	Cumulative Percent
	Normal Male <50IU/L	69	32.5	32.5
	Normal Female <35IU/L	94	44.3	76.9
	Mild and Moderate Liver damage Male (50-100)IU/L	2	0.9	77.8
	Mild and Moderate Liver damage Female (35-100)IU/L	43	20.3	98.1
	Severe 100+	4	1.9	100.0
	Total	212	100.0	

The table above showed the result for liver function test 69(32.5%) were normal male, 94 (44.3%) were normal female, 2(0.9 %) males were with mild and moderate damaged liver, 43(20.3%) females were with mild and moderate damaged liver and 4(1.9%) were with severe damaged liver.

Table 4: Distribution of patients by results of ALT test and sex

Level of liver damage	Frequency	Percent	Cumulative Percent
Normal Male <60IU/L	72	34.0	34.0
Normal Female <40IU/L	116	54.7	88.7
Mild and Moderate Male (60-100)IU/L	3	1.4	90.1
Mild and Moderate Female (40-100)IU/L	17	8.0	98.1
Severe 100+	4	1.9	100.0
Total	212	100.0	

The table above showed liver function test results using ALT test. Normal female and male 116(54.5%) and 72(34.0%) respectively for liver function represent major group, mild and moderate liver damage in female 17(8.0%) and male 3(1.4%) are greater than severe liver damage 4(1.9%).

Table 5: Prevalence of liver (mild, moderate and severe) damaged Patients

State of liver function	Frequency	Percent	Cumulative Percent
Normal liver(males and females)	188	88.68	88.68
Liver damage (mild,moderate and severe)	24	11.32	100
Total	212	100.0	

The table above shows the distribution of patients based on prevalence of normal Liver function and liver damage (mild, moderate and severe) in patients: 88.68% were with normal liver function and 11.32% were with mild, moderate and severe damaged liver.

DISCUSSION

This retrospective study was conducted on HIV-positive individuals exposed to ART and tested for liver function by using AST and ALT. We found that the prevalence of liver damage was 11.32 %. This prevalence is lower and seems to be equal to that found in another study with (12.41%)[10] and very low to those found in South Africa (17%), Cameroon (42.1%), Nigeria (36.4%), and Iran (32%)[11]. However, it is higher than that of other cohort studies in Uganda (4.2%), Botswana (1.1%), Netherlands (7.9%) and Taiwan (4.9%)[11]. The difference could be due to the differences in the prevalence of risk factors for liver disease like hepatitis B and C and other opportunistic infections and commitment of health care provider in follow-up duration and periodic monitoring of liver damage in patients. In the present study, severe hepatotoxicity was 1.9% of the all patients. This finding is consistent with other studies carried out in Uganda and Thailand that showed the prevalence of severe liver damage of 2.9 % and 1.3 % respectively[12].The decreased prevalence of severe cases of liver damage in our study (1.9%) may be brought on by efforts of Gitwe District Hospital health professional who test and change medication for patients before progression of moderate liver damage to severe liver damage.

CONCLUSION

According to the present study, many HIV-infected people exposed to ART 188(88.68%) were with normal liver function, 24 (11.32%) were with mild, moderated and severe liver damage. Severe case of liver damage were very few. This result emphasizes the significance of regular monitoring in order to avoid severe liver damage. The findings of this study will assist policymakers and future researchers in decision-making based on evidence.

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Competing Interests: None declared.

Ethics approval: The study was approved by the University of Gitwe and Research Committee of Gitwe District Hospital.

Conflict of Interest: Authors declare no conflict of interest on availability of raw data and material**.**

Author Contributions: All authors have equal contributions in the preparation of the manuscript and compilation.

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