MAKERERE UNIVERSITY

ABDOMINAL SONOGRAPHIC CHANGES AMONG HIV-TB CO-INFECTED ADULT PATIENTS INITIATING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY AT MULAGO HOSPITAL COMPLEX

BY

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DECLARATION

I, JABO CHRISTIAN ROY THOMAS declare that the work presented in this dissertation is original and has not been presented for any award in any other University.

Contributions made by other people towards this research have been acknowledged and appreciated.

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APPROVAL

This study dissertation entitled, "*Abdominal Sonographic Changes among HIV-TB Co-Infected Adult Patients Initiating Highly Active Antiretroviral Therapy at Mulago Hospital Complex"* has been submitted to Makerere University for examination with our approval as supervisors.

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DEDICATION

This work is dedicated to the entire Jabo family for their love, prayers, encouragement and support towards my education.

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OPERATIONAL DEFINITIONS

TUBERCULOSIS: An infectious disease of humans and animals caused by the tubercle bacillus and characterized by the formation of tubercles on the lungs and other tissues of the body, often developing long after the initial infection.

HIV: A lentivirus (a member of the retrovirus family) that causes acquired immunodeficiency syndrome**.**

TB-HIV CO-INFECTION: Simultaneous infection by TB and HIV.

ABDOMINAL TB: TB affecting the peritoneum, abdominal lymph nodes, omentum, liver, spleen, and/or gastrointestinal tract.

PARADOXICAL TB IRIS: Manifestation of new or recurrent TB symptoms or signs in patients being treated for TB during early antiretroviral therapy (ART).

HAART: Combined antiretroviral treatment regimens (three or more different ART drugs) used to suppress HIV viral replication and the progression of HIV disease..

EARLY INITIATION OF HAART IN HIV-TB CO-INFECTION: Starting ARVs within 2 weeks of initiating TB treatment.

ULTRASOUND: Mechanical radiant energy with a frequency greater than 20KHZ (cycles per second).Diagnostic ultrasound uses a frequency 1MHZ-20MHZ**.**

SONOGRAPHIC: Pertaining to or comprising the ultrasound evaluation of an organ.

ECHOGENICITY: Intensity of echo reflected by tissue or structures from inside the body.

HYPERECHOIC: Refers to high intensity echo compared to an adjacent structure.

HYPOECHOIC: Refers to low intensity echo compared to an adjacent structure.

ASCITES: Accumulation of fluid in the peritoneal cavity**.**

LYMPHADENOPATHY: A disease or enlargement of lymph nodes.

HEPATOMEGALY: Enlargement of the liver.

SPLENOMEGALY: Enlargement of the spleen.

NEPHROPATHY: Damage to or disease of a kidney

ABSCESS: A collection of pus that has accumulated within a tissue because of an inflammatory process in response to either an infectious process or other foreign materials.

HEMANGIOMA: A benign and usually self-involuting tumor of the endothelial cell that line blood vessels, and is characterized by increased number of normal or abnormal vessels filled with blood.

CHOLECYSTITIS: Inflammation of the gall bladder.

APPENDICITIS: Inflammation of the appendix.

PROSTATITIS: Inflammation of the prostate gland.

LIST OF ABBREVIATIONS

AIDS	:	Acquired immune deficiency syndrome
HIV	:	Human immunodeficiency virus
TB	:	Tuberculosis
IRIS	:	Immune reconstitution inflammatory syndrome
TBIRIS	:	Tuberculosis immune reconstitution inflammatory syndrome
HAART	:	Highly Active Anti Retroviral Therapy
ART	:	Anti Retroviral Therapy
INSHI	:	International Network for the Study of HIV-associated IRIS
MTB	:	Mycobacterium tuberculosis
WHO	:	World Health Organization
ATB	:	Abdominal tuberculosis
ZN	:	Ziehl Nielsen
ESR	:	Erythrocyte sedimentation rate
CRP	:	C reactive protein
ALT	:	Alanine transaminase
AST	:	Aspartate transaminase
HIVAN	:	Human immunodeficiency virus associated nephropathy
OR	:	Odds ratio

ABSTRACT

Human immunodeficiency virus (HIV) infection increases the risk for infection with Mycobacterium tuberculosis (TB). In HIV-TB co-infected patients, abdominal tuberculosis accounts for 11-16% of extra pulmonary cases. Abdominal sonographic changes following initiation of Highly Active Antiretroviral Therapy (HAART) in these patients may be due to the response to anti-Tuberculous drugs and HAART, due to adverse reactions to these treatments or due to other associated co-morbidities. The changes may show improvement of abdominal features during treatment or worsening as a result of paradoxical TB-IRIS. They may also be new findings due to other opportunistic infections. Ultrasound imaging is a useful auxiliary investigative modality in the management of HIV-TB co-infected patients initiating HAART and it can demonstrate these abdominal sonographic changes. However, there is no recent research on its role in the management of HIV-TB co-infection in Uganda.

Objective

The study aimed at describing the abdominal sonographic findings among HIV-TB co-infected adult patients initiating HAART at Mulago Hospital Complex.

Methodology

A prospective descriptive study design was used. This study was nested in a prospective observational cohort study whose aim was to determine the incidence and predictors of clinical and immunological outcomes in adult patients co-infected with TB-HIV. It was conducted in the Department of Radiology at Mulago Hospital, the national referral hospital. Adults with HIV-TB co infection eligible for HAART were enrolled in the study. Serial abdominal ultrasound scans using low frequency (2-5MHZ) and high frequency probes (7-12MHZ) were performed. Data were collected on structured questionnaires, entered into a computer using Epi data version 3.1 and analysed using Stata version 11 with the help of a statistician.

Results

Eighty nine patients were enrolled and had a baseline ultrasound scan, 70 (78.7%) patients had a scheduled follow up scan and 10 (11.2%) had an ultrasound scan during an unscheduled visit. 9 patients (10.1%) were lost to follow up of whom 6 patients died (66.7%)

while 3 (33.3%) did not return for the scheduled scan. 65.2% were males and 34.8 % were females giving a male to female ratio of 1.9:1. The age range was from 20-62 years and the median age was 32 years.

There was no statistically significant difference in the abdominal sonographic findings at base line and 4 weeks after initiating HAART. Clinical features of abdominal pain and abdominal distention were significantly associated with development of abdominal sonographic changes while abdominal pain was the only symptom significantly associated with worsening of the abdominal sonographic changes (a OR=6.0, 95% CI=1.106-13.552 and a p value=0.038) on follow up or on development of symptoms of TB-IRIS.

Fourteen patients had normal abdominal scans while 75 had features suggestive of abdominal TB on baseline scan like lymphadenopathy, hepatosplenomegaly and splenic nodules. Fourteen patients had features suggestive of TB-IRIS on the follow up and unscheduled scans. Co-morbidities like nephropathy, splenic candidiasis and carvenous hemangiomas were diagnosed.

Sonographic changes observed in the abdomen were resolution of splenic infarction, regression of splenic abscesses, appendicitis, prostatic abscess, ascites, lymphadenopathy, cholecystitis, splenomegaly and hepatomegaly.

Conclusions

There is an increased incidence of HIV-TB co-infected patients with sonographic features which may be suggestive of abdominal tuberculosis at baseline scan.

Worsening abdominal sonographic changes within 4 weeks of initiating HAART tend to be associated with paradoxical TB-IRIS.

Abdominal pain and distention are associated with development of abdominal sonographic changes.

Abdominal pain is significantly associated with worsening of abdominal sonographic features on follow up visits.

There is no statistically significant difference between abdominal sonographic features at baseline and follow up 4 weeks after initiating HAART.

Recommendations

A study designed to establish the clinico-sonographic-pathological correlation and the schedule for follow up scans is highly recommended.

Follow up abdominal sonography should be delayed beyond 4 weeks unless patients develop new symptoms or worsened symptoms.

A screening ultrasound examination for TB-IRIS should be performed in all HIV-TB co-infected on treatment who develop abdominal pain.