PREVALENCE OF LOWER URINARY TRACT SYMPTOMS AND ASSOCIATED RISK FACTORS AMONG HIV AND AIDS PATIENTS ATTENDING CARE AND TREATMENT CLINIC AT MUHIMBILI NATIONAL HOSPITAL FROM JULY TO DECEMBER 2007

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A dissertation submitted in partial fulfillment of the requirement for degree of Master of Medicine in Surgery of Muhimbili University of Health and Allied Sciences

Muhimbili University of Health and Allied Sciences
October, 2008

CERTIFICATION

The Undersigned certifies that, he has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: '***Prevalence of lower urinary tract symptoms among HIV and AIDS patients attending Care and Treatment Clinic at MNH from July to December 2007'***. Submitted in partial fulfillment of requirement for degree of Master of Medicine in Surgery of Muhimbili University of Health and Allied Sciences

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DECLARATION AND COPYRIGHT

I, **Mugisha Clement** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for similar or any other degree award.

Signature 

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DEDICATION

This dissertation is dedicated to my beloved wife Dr Grace Elias Magembe and my daughter Kemilembe Gabriella Mugisha for their love, commitment and support throughout my study period.

ABSTRACT

Lower urinary tract symptoms can cause morbidity and hence lowering the quality of life of HIV and AIDS patients, and can also lead to mortality. In most cases, HIV and AIDS patients with lower urinary tract symptoms (LUTS) are regarded as having urinary tract infection and so they end up being treated with antibiotics. It should be remembered that in some cases infection might not be the only cause of the symptoms and hence the importance of looking at the problem in a wider perspective.

A cross- sectional study was conducted at MNH CTC to determine the Prevalence of LUTS and associated risk factors in HIV and AIDS patients. Study was conducted for six month, socio-demographic data and their risk factors for LUTS were identified and those patients who had LUTS and UTI were treated and followed up for 2weeks.

A total of 260 patients, 116(44.6%) male, and 144 (55.4%) female were recruited during the study period. All patients involved in the study were requested to respond to structured questionnaires on LUTS using standard International Prostate Symptom Score (IPSS) criteria and also urine samples were taken.

The majority of patients were in the age group of 27-46 years. Among 260 patients, 163 patients had no LUTS and 97 patients had LUTS; therefore the prevalence of LUTS was 37.3%. Among 97 patients with LUTS, 77.4% had mild symptoms, 18.6% had moderate symptoms, and 4% had severe symptoms by IPSS.

Of 97 patients with LUTS, 55.7% presented with obstructive symptoms, 30.8% had irritative symptoms and 10.3% had others (dysuria and haematuria). Among those presenting with obstructive symptoms , 34.2% had intermittency,14.4% had incomplete emptying,10.3% had poor stream , while of those with irritative symptoms , 11.3% had increased frequency,11.3% had nocturia ,8.2% had urgency,3.2% had incontinence and 10.3% had dysuria and haematuria .

Results from urine culture showed that, the overall prevalence of bacterial growth was 9.6%. In patients with LUTS the prevalence was 9.2% and 10.3% in patients who had no LUTS. E.coli growth was found in 6 patients with LUTS and 8 patients who had no LUTS. S.aureus growth was found in 4 patients, of whom 2 had LUTS and 2 had no LUTS. P. aeruginosa was found in 4 patients of whom one had LUTS and 2 had no LUTS. However, these findings were not statistically significant (p=0.91). Also one patient who had no LUTS had asymptomatic bacteriuria. Most of the bacteria were sensitive to gentamicin, nalidixic acid, clindamycin, ceftriaxone and few were resistant. All bacteria were found to be resistant to Cotrimoxazole.

The age of the patient was found to be a risk factor for LUTS (p=0.024). This study also identified sex (male), use of ARVs, Use of prophylactic antibiotics, cigarette smoking, drinking alcohol, neurological symptoms, hypertension and opportunistic infections as risk factors of LUTS. However the findings were not statistically significant (p>0.05)

From this study it is evident that LUTS is a problem among HIV and AIDS patients attending CTC, several risk factors have been found. However, more studies need to be conducted in large sample size and in different settings in order to establish the magnitude of the problem in Tanzania and to advice on the standard of care among HIV and AIDS patients who present with LUTS.

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ABBREVIATIONS

AIDS	-	Acquired Immunodeficiency Syndrome
AMMP	-	Adult Morbidity and Mortality Project
ART	-	Anti-Retroviral Therapy
ARVs	-	Anti-Retrovirals
BPH	-	Benign Prostatic Hyperplasia
CNS	-	Central Nervous System
CTC	-	Care and Treatment Clinic
CLED	-	(Cellulose) Lactose-Electrolyte-Deficient
CMV	-	Cytomegalovirus
CTC	-	Care and Treatment Clinic
ddI	-	Didanosine,Videx
ddC	-	Zalcitabine, Hivid
d4T	-	Stavudine, Zerit
HAART	-	Highly Active Anti-retroviral Therapy
HCV	-	Hepatitis C virus
HIV	-	Human Immunodeficiency Virus
IPSS	-	International Prostate Symptom Score
LUTS	-	Lower Urinary Tract symptoms
MNH	-	Muhimbli National Hospital
MUHAS	-	Muhimbili University of Health and Allied Sciences
NACP	-	National AIDS Control Programme
NRTIs	-	Nucleosides Reverse Transcriptase Inhibitors
OIs	-	Opportunistic Infections
UTI	-	Urinary Tract Infection
PCP	-	Pneumocystic Carnii Pneumonia
TB	-	Tuberculosis

1. INTRODUCTION AND LITERATURE REVIEW

1.1 Epidemiology

HIV and AIDS was first described in 1981 when a clusters of Kaposi's sarcoma and Pneumocystic carnii pneumonia (Pneumocystic jovesii) were reported in previously healthy young homosexual men in Los Angeles and New York City in 1983 .The causative organism ,a retrovirus (HIV) ,was discovered and shown to be the etiological agent . [1, 2, 3]

HIV and AIDS is a major health problem globally. In 2004, it was estimated that about 40million people were living with HIV and AIDS world wide. Sub-Saharan Africa is the worlds most severely affected region. With only 10% of the world's population it harbors about two thirds of the global total number of people living with HIV and AIDS. One in 12 adults in this region is reported to be infected with HIV.[4]

Since 1983 when the first cases of AIDS were reported in Tanzania, the HIV epidemic has spread rapidly to all districts and communities affecting all sectors of the society. A total of 18,929 AIDS cases are reported to NACP from the 21 regions during 2003. This resulted in a cumulative total of 176,102 reported cases since 1983 when the first 3 cases were identified in the country .[4]

In 2003 over 1.8millions persons were estimated to be living with HIV and AIDS and there were close to 800,000 AIDS cases. The HIV infection among blood donors during 2003 was 8.8%. Recent data based on house hold survey estimated the seroprevalence in adults in Tanzania to be 7% with a wide variation across the regions.

Most of infections are transmitted through sexual intercourse and hence the populations most severely affected are sexually active individuals between 15 and 49years of age. Women have higher risk of becoming infected than men.[4]

The impact of the HIV epidemic has been profound and affects all sectors. Today, HIV and AIDS are recognized not only as a major public health concern but also a socio-economical and development problem in Tanzania as in many sub-Saharan African countries. Data from the adult morbidity and mortality project (AMMP) in 2002 showed that HIV and AIDS and TB were the leading causes of mortality in Hai, Tem eke and Morogoro rural districts where the study was done.[4]

Almost 25 years have now elapsed in which HIV infection has changed from a fatal condition to a manageable chronic illness. Twenty-five years in which the development of antiretroviral therapy (ART) has been one of the dramatic advances in the history of medicine. However, for the vast majority of people living with HIV and AIDS, ART is still years away ,largely inaccessible in resource- poor countries where HIV continues to devastate families, communities and societies, especially the poor and the socially marginalized.[4,5,6,]

Different systems in human are affected by HIV and AIDS. When the virus affects CNS and peripheral nerves then patients may present with encephalitis and peripheral neuropathy etc, and also predispose the CNS to infection like Cryptococcus. Other systems affected are respiratory, cardiovascular, genital urinary tract, gastrointestinal tract and muscular skeletal system.

1.2 HIV and AIDS and Opportunistic infections

There is no drug yet to cure HIV infection but there is treatment for opportunistic infections caused by HIV induced immune deterioration. Most HIV and AIDS patients do not die due to HIV infection but due to complications that HIV induced immune

deterioration can not handle. In Western industrialized countries, many opportunistic infections (OIs) have become rare today. [7] This is particularly true for those infections that are associated with severe immunodeficiency, such as CMV and HCV.

For hepatitis C the mode of transmission is almost the same as HIV (parenteral, sexual, and vertical) and in USA it has been found in one study that 30% of HIV patients had co-infection with HCV. [8] The incidence of these OIs has now been reduced to less than one tenth of their frequency in the pre-HAART era. However, HAART has not only lowered the incidence, but also changed the course of OIs quite considerably [7.] While survival times after the first AIDS illness were previously two to three years at most, many patients now live with AIDS for ten years and longer.

A study done by Jacobson[7] around 150 patients with cerebral toxoplasmosis demonstrates this: while 5-year survival after the toxoplasmosis episode was at 8 % in the years 1990-1993, it had climbed to 30 % by 1994-1996. This rate has risen to approximately 80 % since 1997. [9, 10] Most patients who develop AIDS or severe opportunistic infections today are unaware of their HIV infection status. In the year 2000, around 50 % of patients who presented with AIDS at outpatient clinic were unaware of their HIV infection at that time. Therefore, every HIV clinician should be familiar with the diagnosis and therapy of OIs, even today. [10, 11]

HIV epidemic in Sub Saharan Africa in the past two decades has caused a five fold increase in number of TB cases as registered by the National TB programme. Therefore management of HIV and AIDS need to integrated with management of TB because the majority of patients with TB have been found to have HIV and AIDS.[12]

Other pulmonary diseases associated with HIV are PCP, toxoplasmosis, bacterial pneumonia and acute bronchitis.

For all above mentioned OIs use of prophylactic cotrimoxazole in HIV and AIDS patients using WHO criteria (stage III disease, all adult with symptomatic HIV disease, and asymptomatic HIV individual with CD4+ counts <200cells/ml) has improved the health status of the patients and decreased the incidence of OIs .[12]

1.3 HIV and AIDS and Malignancy

Malignant lymphomas are neoplastic diseases of the lymphatic system that grow rapidly and aggressively, and lead to death within a few weeks or months if left untreated. In comparison to the normal population, HIV patients are affected significantly more frequently by all types of lymphoma but the most frequent and, aggressive lymphomas in HIV and AIDS patients are non Hodgkin lymphoma of B-cell origin. The influence of HAART on the incidence of lymphomas is still a subject which is under intense study and investigations. In 2001, several studies indicated that a regression of lymphoma was not as impressive as when you compare the effect of HAART on Kaposi's sarcoma or most opportunistic infections. [13, 14]

In more recent studies 15, a moderate regression was demonstrated. This was shown to be particularly true for all the subtypes of lymphoma that mainly occur in severe immunodeficiency. But, in comparison to other malignancies and opportunistic infections, the regression is much smaller, so that the relative proportion of AIDS-associated illnesses that are lymphomas is increasing. Other studies found that malignant lymphomas have already overtaken Kaposi's sarcoma as the most frequent malignancy. In the Euro SIDA study, the proportion of AIDS-defined illnesses that were malignant lymphomas increased from less than 4 % in 1994 to 16 % in 1998. [16,20] In a study done in France, Malignant lymphomas accounted for 11 % of all deaths in HIV patients in year 2000. [17]

Other neoplastic diseases which are associated with HIV and AIDS are cervical carcinoma [18] and carcinoma of the anal canal. Carcinoma of the cervix became AIDS defining in 1993 and anal carcinoma in patients with HIV is noted to be increasing in past few years.[19]

In addition, in the HAART era, HIV patients are living much longer, so that the general risk of lymphoma is rising. [20] Therefore, malignant lymphomas will be a significant morbidity and mortality factor in HIV patients in the future

1.4 HIV and AIDS and Neuropathy

Peripheral neuropathies may be a complication of different stages of HIV infection. During the early asymptomatic stages peripheral neuropathies are uncommon, but electro diagnostic testing reveals sub clinical evidence of peripheral nerve involvement in about 10% of cases. In later stages, symptomatic neuropathies occur in some 30-50 % of patients. Neuropathological studies have shown pathological changes with prevalence approaching 100 % in patients with AIDS. The neuropathies can be classified as primary HIV-associated or as secondary diseases caused by neurotoxic substances or opportunistic infections. Although neuropathies related to HIV infection have been on the decline since the introduction of HAART, there has been an increase in the prevalence of toxic neuropathies.[21] Different types of peripheral neuropathies can be distinguished on the basis of when they occurred with respect to the stage of HIV disease, and by the clinical course, major symptoms and electrophysiological and neuropathological features. It is estimated that about one-third of people with HIV and AIDS experience some peripheral nerve damage. Neuropathy can have different causes, but in HIV and AIDS peripheral neuropathy can be caused by the virus itself, or as a result of opportunistic infections (e.g., cytomegalovirus [CMV], candidiasis [thrush], herpes, and tuberculosis). Neuropathy could also result from other associated causes, such as heavy alcohol consumption and vitamin deficiency.

The symptoms of peripheral neuropathy that HIV and AIDS patients usually experience include burning, stiffness, prickling, tingling, and numbness or a loss of feeling in the toes and soles of the feet. Sometimes the nerves in the fingers, hands, and wrists are also affected.

Peripheral neuropathy can be potential side effect of certain medications used to treat HIV and AIDS. Nucleoside reverse transcriptase inhibitors (NRTIs), or "d-drugs", are most frequently associated with peripheral neuropathy (ddI, ddC or d4T). [22]

1.5 HIV and AIDS and Cardiac diseases.

In HIV infected patients, the HIV-associated dilated cardiomyopathy is of major interest. It corresponds to a dilated and less contractile left ventricle. Myocarditis[23] is still the most thoroughly studied cause of dilated cardiomyopathy in HIV disease. Until now, a variety of pathogens has been found in the myocardial tissue of HIV-infected patients. Furthermore, human immunodeficiency virus itself appears to infect myocardial cells in a patchy distribution. Although it is unclear how HIV-1 enters CD4-receptor-negative cells such as cardiomyocytes, reservoir cells may play a role in the interaction between HIV-1 and myocytes. In addition to a direct impact of the human immunodeficiency virus or other pathogens, dilated cardiomyopathy was reported in association with an autoimmune reaction. Cardiac-specific autoantibodies (anti-α-myosin antibodies) have been reported in up to 30 % of HIV-infected patients with cardiomyopathy.

However, several studies also indicate that in HIV-infected patients, dilated cardiomyopathy is associated with cardiotoxic agents (e.g. pentamidine, interleukin-2 and doxorubicin) or as the sequelae of malnutrition.

Furthermore, it is expected that antiretroviral therapeutic drugs may induce cardiac dysfunction due to mitochondrial toxicity.[24,25] Before effective antiretroviral drugs were available, pericardial effusion was the most frequent cardiac manifestation. In clinical trials, the incidence of pericardial effusions was recognized to be as high as 11 % per year.[24, 25]

In a recent report from South Africa, where pericardial effusion is obviously still more common than in Europe or North America, 96 % of HIV patients with large pericardial effusions had tuberculous pericarditis.[26]

However, non-HIV-associated causes of pericardial effusion, such as uremia, trauma, irradiation, and drugs, have to be considered. Pericardiotomy might be an option in palliative in treatment of pericardial effusion.

1.6 HIV and AIDS and Renal diseases

Renal glomeruli are target organs for every hematogenous infection. Viral infection can cause primary glomerulonephritis, whereas an immune reaction can lead to secondary glomerulonephritis. HIV infection, hepatitis B and C as well as bacterial infections are all typical causes of renal disease. Nephrotoxic agents precipitate renal diseases that affect the interstitium and the tubular apparatus in particular, and these have to be differentiated from glomerulonephritis. Both forms can cause renal impairment and can lead to end-stage renal disease. While HIV-associated nephropathy (HIV-AN) is predominantly found in Afro- Americans (80-85 %), in the HAART era the greater task will be to examine the renal safety of antiretroviral agents. However, only a small amount of literature is available on this subject to date. HIV-AN is diagnosed in cases of nephrotic syndrome with edema, hypoalbuminemia, hyperlipidemia and proteinuria of more than 3.5 g/day. However, even a mild proteinuria is possible. The occurrence of proteinuria and erythrocyturia is pathognomonic for glomerulonephritis (GN) and, together with a nephritic sediment, usually confirms the diagnosis.[2]

1.7 HIV and AIDS and LUTS

Lower urinary tract symptoms (LUTS) are those symptoms occurring in the lower urinary tract as a result of any pathology occurring anywhere from the urinary bladder to the external urethral meatus or its innervations. As a result a patient may present with difficult in voiding, increased voiding frequency, urinary retention, painful micturation, intermittency or nocturia.

In any micturation cycle usually there are two phases i.e. filling phase /storage phase and emptying phase. In order the urinary bladder to fill first there should be low intravesical pressure (compliance) and appropriate sensation of the bladder and also the outlet pathway should remain closed so as to increase intrabdominal pressure. Voiding requires a urinary bladder to have coordinated contractions of adequate magnitude so as to increase intravesical pressure, [28, 29] also at the level of outlet there should be no obstruction and there should be concomitant lowering of resistance at the level of smooth muscles of the urinary bladder neck and proximal urethra and at striated muscles that surrounds urethra.

Lower urinary tract symptoms can be classified as either due to failure of filling/ storage which can be caused by bladder, urethra outlet obstruction or both, or failure of emptying which can be due to urinary bladder, urethral/outlet or both. In clinical assessment of LUTS thorough history taking, physical examination, neurological examination, urine bacteriological studies and lower urinary tract urodynamic/video urodynamics study are useful.[30] In women also LUTS prevalence increases with age, many people have transient symptoms, but a significant group have on going and disabling problem. The risk factors for urinary incontinence in females are age, postmenopausal status, urogenital diseases, over weight, smoking, and high parity.

In men the noted risk factors are age, cigarette smoking, obesity, high alcohol consumption and elevated blood pressure.[31]

Clinical symptoms of LUTS are divided into two groups as in men, we have storage symptoms for example increased day time frequency, nocturia and urinary incontinence. Voiding symptoms are poor stream, hesitancy, intermittent stream, straining, and terminal dribbling. In women most of filling symptoms are due to UTI, pregnancy, anxiety, overactive bladder, interstitial cystitis, bladder tumors and stones and neurological diseases. Also voiding symptoms may be caused by age related detrusor muscles weakness, and obstructive symptoms by urethral strictures, urethral wall diveticular, drugs (diuretics, anticholinergic and alpha blockers).Treatment of LUTS depends on the established cause, if UTI then antibiotics treatment, if due to weakness of detrusor muscles or neuropathic bladder then bladder training is useful, also surgery and injection of antimuscurinic drugs are used to treat over reactive dextrusor muscles. [29, 30, 31]

Problems with the storage and voiding of urine (Lower Urinary Tract Symptoms (LUTS) are a major burden for the ageing male population. It has been estimated that approximately 30% of men aged 50 and above have mild or severe micturation problems. LUTS are very bothering, and a major indication for surgery in that study [32]. The aspects of quality of life, which have been reported to be affected the most, are sleep, worry about the disease, mobility, leisure, daily activities and sexual activities.[32]

Despite many years of research, the Pathophysiology of LUTS remains unexplained. Obstruction of the urethra by Benign Prostatic Hyperplasia (BPH) a benign enlargement of the prostate – is frequently considered to be the major cause of LUTS in men

However, the BPH-hypothesis is increasingly being doubted since several studies have shown that there is only a weak correlation between prostate enlargement, urethral obstruction and LUTS.

It appears that both BPH and obstruction are common phenomena in elderly men. Instead, it is assumed that the bladder plays a key role in the pathophysiology of LUTS. This hypothesis is supported by the almost equal prevalence of obstruction in both symptomatic and asymptomatic elderly men: a strong bladder may thus be able to build up enough pressure to overcome the obstruction and, on the other hand, a weak bladder can cause micturation problems without obstruction. Improvement of bladder function would therefore be a promising objective of prevention. In support of this, several animal studies have clearly shown that bladder function can be improved. [32]

It has been suggested that lower urinary tract symptoms are more common among sexually active homosexual men than heterosexuals but this has not been confirmed .[33] Lower urinary tract symptoms appear to be common in men with symptoms related to HIV infection and bacteriuria has been reported in up to 8% of the patients. In patients with stage IV AIDS the picture is rather different. Pyuria has been described in 52% of patients with AIDS admitted to hospital, among them urinary tract infections was reported in 20% of the cases. [34]

In one of a retrospective analytical study in the United State of America, 60 patients with acquired immunodeficiency syndrome (AIDS) were studied in 1981 to 1985 to determine the genitourinary manifestations of the disease. It was found that 20% had significant proteinuria and among those 7% had nephrotic syndrome. Also pyuria was found in 52% of patients and urinary tract infections occurred in 20%. Atypical pathogens including *Salmonella, Candida, Actenobacter calcoaticus* and *CMV* were encountered. [35] HIV infections may lead to urological disorders which may be tumors, infections and micturation disturbances. In HIV and AIDS patients it is often difficult to identify the origin of voiding disorders but the most frequently encountered causes are infections , urinary obstruction (vesical, Prostatic or urethral) and neurological (encephalitis, myelitis , and polyradiculoneuritis). [36]

In a retrospective study in France, [37] 39 HIV positive patients with voiding symptoms such as straining, urine retention, frequency and urgency were studied. Each patient underwent thorough neurological and urological examination along with radiological evaluation of urogenital tract and nervous system. Urological evaluation was performed to specify the etiology and disturbance before treatment and patients were followed up for 2 to 24 months. Out of 39 patients, 34 (87%) patients had urodynamic abnormalities including hyperactive urinary bladder, dysnergia and hypoactive bladder. It was found that causes of voiding disorders in 61.5% of cases were neurological and also most frequent neurological disorders were cerebral toxoplasmosis and HIV encephalitis,[38] these disorders were treated with drugs acting on the detrusor sphincter complex. Of the 39 patients 22 patients (57%) had a lasting improvement while 17(43%) died 2 to 24 months (mean 8 months) after onset of the voiding symptoms. [34, 33]

Lower urinary tract symptoms in HIV and AIDS patients affect in one way or another overall health related quality of life of individuals. Among quality of life factors that may be affected are psychological wellbeing, sleep disturbances, restriction in daily and social and sexual activities and relationships, depression and anxiety .Some of the patients will have indwelling catheters because of incontinence .Other patients will tend to change their life style trying to cope with their symptoms by limiting their fluid intake, by consciously emptying their bladder before it is full and limiting their activities to places providing easy access to toilets . All these aspects will lead to anxiety, discomfort, embarrassment and uneasiness.[39]

In a study in African-American men aged 40-79 years to determine the risk factors for Lower urinary tract symptoms in 1996 to 1998. The role of socio-demographic, life style and medical history risk factors were assessed in patients with moderate to severe lower urinary tract symptoms including sub categories of irritative and obstructive symptoms.

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It was then found that current and former smokers, heavy alcoholics and hypertensives were at increased risk of lower urinary tract symptoms including obstructive and irritative symptoms. High income was inversely associated with lower urinary tract symptoms. [40]. In patients with a low CD 4+ count, neurological symptoms may occur. Bladder areflexia and hyporeflexia are common neurological complications which lead to urinary stasis and ultimately infections. In this study urinary tract infections occurred in 17% of patients, with a 16% incidence of lower urinary tract related symptoms.

Symptoms of lower urinary tract infection included dysuria, frequency, urgency and haematuria but many patients were relatively asymptomatic. [41] *E. coli,* which accounts for up to 80% of urinary tract infections in general population, only occurred in 25% of patients with HIV and AIDS in this study. [41, 42]

Also *P. aureginosa* was found in up to 33% of the patients. And this study also highlighted that bacterial infections are more common in AIDS patients with CD4+ count less than 200 cells per micro liters,[38, 43] in some of the patients urinary tract symptoms were present but culture was found to be negative

One of the explanations could be that many HIV and AIDS patients take prophylactic antimicrobials for opportunistic infections causing pneumonia or diarrhea and this renders culture negativity. Non-bacterial urinary tract infections (yeast, fungal, viral) were also common in this patient population, especially in patients with low CD 4+ counts, and negative culture should alert the urologist to perform special cultures and stains. [38,43, 44]

In one of the rare cases reported, a 36 years old AIDS patient presented with recurrent dysuria and urinary obstruction due to Cryptococcal prostatis. Although there are handfuls of reports in the world literature of patients with Cryptococcal prostatis, this appears to be the first case reported related to acquired immune deficiency syndrome. [4]

2 .STATEMENT OF THE PROBLEM

It is estimated 40 million people world wide were infected by HIV by December 2006 [46].World wide, AIDS is now the fourth largest cause of death and in sub Saharan Africa it is now leading cause of death. It is estimated that there were 3.5 million new HIV infections in 2003. Out of 40 million infected people, 29milion people live in Africa continent.

In Tanzania prevalence is estimated to be 9.6% among adults translating to 2.2millions Tanzanians.[12, 44] in this era of HIV and AIDS pandemic many HIV and AIDS patients with lower urinary tract symptoms and urinary tract infections pause a great challenge in management. Due to immunodeficiency state most of patients with LUTS will have atypical presentation, negative culture and sensitivity results and wrongly treated HIV patients presenting at CTC with LUTS are regarded as having urinary tract infections and the majority are managed by antibiotics. But observations have shown that some of the patients who present with lower urinary tract symptoms had voiding dysfunction not related to bacterial infection and therefore needed to be treated differently. The magnitude of the problem, associated risk factors and impact of lower urinary tract symptoms on patient with HIV and AIDS are unknown. A variety drugs are widely available for treating voiding dysfunction and other related LUTS.

Those drugs however are not commonly used by physician in the CTC clinic and these patients are unnecessarily referred to a urologist for work up and treatment of their symptoms. Doctors at the CTC are not aware of other possible cause of LUTS in HIV and AIDS patients. Also doctors at CTC are not informed on the treatment of non infectious cause of LUTS, and drugs other than antibiotics are not available at CTC. Therefore LUTS in HIV and AIDS patients are common, yet not actively looked for and properly treated. Lower urinary tract symptoms and their associated factors are under reported and under recognized and wrongly treat

3. RATIONALE

To manage these patients it is essential to develop an understanding of effect of HIV infection on the lower urinary tract and factors related with the development of lower urinary tracts symptoms

No study has been done at MNH on lower urinary tract symptoms and associated factors related to HIV and AIDS patients .Therefore since there are no data on the magnitude of this problem at MNH or in Tanzania, this study will be very useful in showing the extent of problem and will advise on daily management of patients with HIV and AIDS and lower urinary tract symptoms. This study will recommend the resources needed for the clinic. It will also recommend future intervention and studies.

This study is also being done as a partial fulfillment for the award of the degree of Master of Medicine in Surgery, of Muhimbili University of Health and Allied Sciences

4. RESEARCH HYPOTHESIS

Lower urinary tract symptoms among HIV and AIDS patients are not necessarily associated with lower urinary tract bacterial infection.

5. OBJECTIVES

5.1 Broad objective:

To determine the prevalence of lower urinary tract symptoms and associated factors Among HIV and AIDS patients attending CTC at MNH.

5.2 Specific objectives

5.2.1. To determine the prevalence and severity of lower urinary tract symptoms among patients attending CTC at MNH

5.2.2. To determine the distribution of principle presentation of lower urinary tract symptoms among HIV and AIDS patients attending CTC at MNH.

5.2.3. To determine factors associated with lower urinary tract symptoms among patients attending CTC at MNH.

5.2.4. To determine urine microscopic, bacteriological and sensitivity pattern among HIV and AIDS patients with lower urinary tract symptoms attending CTC at MNH.

6. METHODOLOGY

6.1. Study design

This was a cross-sectional descriptive study in order to determine the magnitude of lower urinary tract symptoms in HIV and AIDS patients attending the CTC at MNH. The study involved two consecutive visits. In the first visit recruited patients were interviewed, their records reviewed and a mid stream urine sample taken for microscopic, dip stick urinalysis and culture and sensitivity.

The second visit was 3 days after the first visit. In the second visit enrolled patients were reviewed together with their urine results. The results of urinalysis and urine for culture and sensitivity were recorded in patients data sheet and appropriate treatment was given according to the bacterial sensitivity whenever culture results turned to be positive. Those who had symptoms (incontinence, frequency) but their culture results turned to be negative were given Oxybutynin (Ditropan) 2.5 to 5mg once daily for 14 days. Patients were followed up after 2wks. .

6. 2. Study period

Six months duration between July to December 2007

6.3. Study area

Muhimbili National Hospital CTC clinic this is a clinic which started in July 2004 for patients who have been diagnosed to be infected by HIV, they may have been diagnosed at MNH or referred from other clinics/hospitals within the city or upcountry with HIV and other associated conditions like malignancies, disabilities and opportunistic infections. The clinic is conducted from Monday to Friday from 9 am to 4 pm.

The clinic has a total of 32 doctors, 9 nurse officers/counselors, one recorder,1 data clerk, and 2 health attendants. Of the 32 doctors, 9 are specialists, 14 residents and 9 registrars (3 registrars are on duty available every day at the clinic).Daily activities of the clinic are providing counseling, most of the time post testing, counseling on importance of adherence to ARVs and some of side effects of the ARV drugs, regular assessment of patients by clinical and laboratory assessment.

They also treat opportunistic infections associated with HIV and AIDS and in case the patient has a problem related to certain specialty e.g. if a patient has urological problem he or she is advised to attend both urology and CTC.

6.4. Study population:

All patients attended CTC at MNH were eligible. During the study period an average of 400 patients attended the clinic each week. Those patients with CD4+count less than 200 cells/microl attended the clinic monthly, and those with CD4+ count above 200cells/microl and are not using ARV attended the clinic every 2^{nd} or 3^{rd} month. Patients were enrolled on Mondays and Wednesdays and those were the days whereby new cases were enrolled.

6.5. Inclusion criteria

All HIV and AIDS patients presenting at the CTC with or without lower urinary tract symptoms. In those who had lower urinary tract symptoms, LUTS was defined by having any of the following symptoms: - incomplete urinary bladder emptying, frequency, intermittency, urgency, weak stream, straining or nocturia. Those found to have LUTS, questionnaire for scoring severity of symptoms was administered and patients were classified as 0-7 (mild symptomatic), 8-19 (moderately symptomatic, or 20-35 (severely symptomatic) as per International Prostate Symptom Score (IPSS).

6.6. Exclusion criteria

Patients who did not give their consent to participate in the study.

Very sick patients and those known to have BPH (Bladder outflow obstruction) or carcinoma of prostate, carcinoma of urinary bladder (e.g. patients referred to the clinic with a diagnosis of BPH and carcinoma of Prostate)

Other exclusion criteria were lower urinary tract Schistosomiasis, lower urinary tract stones and known patients with urethral stricture. (These patients were referred from Urology clinic with a confirmed diagnosis), male patients with age above 40 years.

6.7. Sample size;

Was calculated using the formula;

$$n = \frac{z^2 p(1-p)}{\varepsilon^2}$$

Where:- Z-percentage point of normal distribution corresponding to the significance level (1.96)

p- Prevalence from the pilot study 0.2

ε-maximum likely error 0.05

Therefore n= **246** patients as minimum number

In this study total number of 260 patients were recruited for the study

6.8. Sampling technique:-

During the study period patients were enrolled on Monday and Wednesday, these were days of new cases. Daily patients' registers were used; serial numbers of patients were made from patients register. Then patients were selected using the random number tables using serial numbers and every visit of the clinic 10-15 patients were selected until 260 patients were obtained.

Patients then were requested to participate and signed a consent form and urine sample was collected. Also case notes were checked for CD4+ count and recorded in the questionnaire

6.9. Data collection

Every patient who was requested to participate in the study and was well informed about the study. Then he/she was asked to sign the consent form. Questionnaires were used to collect information from patients. Questionnaires contained three main parts: demographic data, clinical presentation and laboratory examination of collected urine specimens. Patients were taught and advised to collect mid stream urine, specimen were collected in empty sterile bottles and sent for microbiology laboratory for urinalysis, culture and sensitivity.

Only patients with LUTS were requested to respond to structured questions by IPPS. Questions concerned incomplete emptying, frequency, intermittency, urgency, weak stream, straining, and nocturia were asked. Patients were then graded according to severity of their symptoms from 0 to 5 and were classified as : -

- 0-7 (mildly symptomatic),
- 8-19 (moderately symptomatic),
-20-35 (severely symptomatic)

6.10. Data Analysis

All filled questionnaires were given identification number before entering into the Epi Info statistical package, coding was done and data were entered into Epi Info 6 version, data cleaning was done and later frequencies of all variables were printed out. Cross tabulations was done for defined independent variables to obtain table of results. Then x^2 test, frequency, prevalence and significance test were calculated and p- value of less than 0.05 was considered as significant .

6.11. Specimen collection

A sample of urine was collected in an empty sterile bottle 20 to 30mls. Patients were told to collect the mid stream urine specimen. The specimen then was analyzed within an hour after collection. If it was necessary for it to be examined more after an hour then they were kept in a refrigerator at 4 degree Celsius. The examination was done in a period not exceeding 18hrs from collection.

6.12. Lab investigations

Urine samples collected from every patient were partly used for urinalysis and culture sensitivity.

6.12.1. Urinalysis

Then the samples were examined by laboratory technologist for macroscopic examination, urine chemistry, microscopic results and culture and sensitivity (at 24hrs, 48hrs and 72hrs) and results were documented for every patient.

6.12.2. Urine for culture and sensitivity:

This was done to all samples collected, and bacterial counts of at least 100,000/ml were regarded as significant bacteriuria. Ten fold dilutions was made and a sample from dilution streaked on culture CLED culture medium[45]

6.13. Variables

6.13.1. Independent variables

The independent variables were; age, marital status, sex, occupation, level of education, cigarette smoking, alcohol consumption, hypertension, ARVs, opportunistic infection, Use of prophylactic antibiotics, CD4+ count and HIV and AIDS.

6.13.2. Dependent variables

Dependent variable was LUTS

6.14 Ethical consideration:

Ethical clearance was granted by MUHAS ethical committee. Also permission was given by director of clinical services of MNH to use the CTC. Informed consent (verbal and written) was provided by patients Confidentiality was observed by talking to patient, collecting specimen, and whenever necessary examination was done. Patients who refused to participate in the study receive all other services as they were entitled. Those patients who were found to have lower urinary tract symptoms or infection were advised and treated accordingly

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7. RESULTS

A total of 260 HIV and AIDS patients were recruited in this study during the period of 6months, from July 2007 to December 2007. The mean age was 37.3 years and there was range 17-69 years. Age group between 27-46 years constituted 85.4% of all patients. Female constituted the majority (55.4%) and male 44.9%, male to female ratio was 0.8:1. Also 46.9% of patients involved in this study were married, 25.8% were single, 14.2 % were widow/widower and 13.1% were divorced/separated. Among 260 patients, 51.9% had primary education, 29.6% had secondary education, 9.6% had college education and 8.8% had informal education. The proportion of patients who were employed was 36.5%, 33.0% were petty traders and 14.2% were peasants. (table 1 below)

Among 260 patients, 163patients had no LUTS and 97 patients had LUTS. Therefore the prevalence of LUTS among HIV and AIDS patients who were attending a CTC at MNH was 37.3%. The majority (77.4%) of patients who had LUTS had mild symptoms, 18.6%moderate and 4% had severe symptoms using a IPSS score, (table 2).

Table 1.

Baseline characteristics of enrolled HIV and AIDS patients attending CTC at MNH (n=260)

Characteristic	Number	Percent
Age group		
17-26	15	5.8
27-36	97	37.3
37-46	125	48.1
47>	23	8.8
Gender		
Male	116	44.6
Female	144	55.4
Marital status		
Single	67	25.8
Married	122	46.9
Divorced/Separated	34	13.1
Widower/Widow	37	14.2
Education		
Primary	135	51.9
Secondary	77	29.6
College/university	25	9.6
Informal	23	8.8
Occupation		
Employed	95	36.5
Petty trader	86	33
Unemployed	37	14.2
Peasants	34	13.1
Student	8	3.1

Table 2.

Severity of Lower Urinary Tract Symptoms by IPSS score among 97 HIV and AIDS patients attending CTC at MNH

IPSS	N =97	Percent
Mild (0-7)	75	77.4
Moderate (8-19)	18	18.6
Severe (20-35)	4	4
Total	97	100.0

Table 3.

Distribution of principle clinical presentation of lower urinary tract symptoms among 97 HIV and AIDS patients with LUTS.

Presenting symptoms	Frequency	Percent
Intermittency	30	31.0
Incomplete emptying	14	14.4
Frequency	11	11.3
Nocturia	11	11.3
Weak stream	10	10.3
Urgency	8	8.2
Dysuria	8	8.2
Incontinence	3	3.1
Haematuria	2	2.1
Total	97	100.0

Among the 97 who had LUTS, 31.0% presented with intermittency,14.4% had incomplete emptying , 11.3% had frequency ,11.3% had nocturia ,10.3% had weak stream and other had urgency, dysuria, incontinence and heamaturia as shown in table 3 above.

Table 4a

Frequency of urine bacterial growth among HIV and AIDS patients attending CTC at MNH (n=260)

Bacteria	LUTS	%	NO LUTS	%	Total	%
E.coli	6	42.7	8	57.3	14	100
S.aureus	2	50.0	2	50.0	4	100
K.pneumoniae	1	33.3	2	66.7	3	100
P.aureginosa	1	33.3	2	66.7	3	100
P.vulgaris	0	0.0	1	100.0	1	100
Total	10		15		25	

X^2 =0.99, df =4, p=0.91

Among 14 bacterial growth of E.coli, 6 E.coli were from patients with LUTS and 8 from patients who had no LUTS .Out of 4 patients who had S.aureus 2 were from the patients with LUTS and other 2 from patients with no LUTS. Three patients had P. aureginosa 1 was from patient with LUTS and 2 bacterial growth from patients with no LUTS. The difference in frequency of bacterial growth between LUTS and non LUTS patients was not statistically significance (p=0.91), table 4a above.

Out of 260 urine cultures, 25 resulted into positive culture giving rate of positive culture to be 9.6%. Those with LUTS had prevalence of 10.3% of positive culture and those without LUTS had prevalence of 9.2 % of positive culture. It is important to note that, one patient had asymptomatic bacteriuria.

Table 4b.

Bacterial growth among HIV and AIDS patients attending a CTC at MNH with their antimicrobial sensitivity (n=260)

Bacteria	AM		PN		GN		NA		TT		OX		CN		CTR		COT		
	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	
E.coli	0	14	0	14	10	4	11	3	0	14	1	13	3	11	9	5	0	14	14
S.aureus	0	4	0	4	2	2	0	4	0	4	4	0	4	0	0	4	0	4	4
P.aurogenosa	0	3	0	3	3	0	2	1	0	3	0	3	1	2	0	3	0	3	3
P.vulgaris	0	1	0	1	0	1	1	0	0	1	0	1	1	0	1	0	0	1	1
K.pneumonia	0	3	0	3	3	0	2	1	1	2	0	3	2	1	2	1	0	3	3
No growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235

Key:

AM-Ampicillin, PN-penicillin G, GN-Gentamicin, NA-Nalidixic acid, TT-tetracycline, OX- Oxacillin, CN-Clindamycin, CTR-Ceftriaxone, COT-Cotrimoxazole, S-Sensitive, R-resistant Culture and sensitivity results revealed the following:- Of 14 patients (5.4%) who had E.coli. E coli from 10 patients were sensitive to Gentamicin and 4 were resistant. E. coli from 11 patients were sensitive to Nalidixic acid and 3 were resistant.

E . coli from 13 patients were resistant to Oxacillin and one was sensitive.

E .coli from 9 patients was sensitive to Ceftriaxone but 5 were resistant.

E.coli from11 had resistance to Clindamycin and 3 were sensitive

Four patients who had S.aureus growth, and were sensitive to gentamicin, Oxacilin, Clindamycin and resistant to Ampicillin, Penicillin, Nalidixic acid, Tetracycline, Cotrimoxazole and Ceftriaxone as shown in the table 4b above.

Table 4c

Urine microscopic outcome among 260 HIV and AIDS patients attending CTC at MNH

Items	Scanty	1+	2++	%
Epithelial cells	11	6	5	8.5
Bacteria	15	4	3	8.5
Yeast	2	0	0	0.8
Hyphae	11	1	0	4.6
Casts				
Hyaline	5	0	0	2.0
Granules	20	3	0	8.8
RBC	5	1	0	2.3
WBC	10	9	5	9.2
Crystals				
Ca2+ oxalate	7	3	0	3.9
Uric acid	8	0	0	3.1
Amphorus phosphate	9	1	0	3.9
Cystein	5	0	0	1.9
Triphosphates	5	0	0	1.9

In urine microcopy, 8.5% had shown epithelial cells, and 8.5% bacteria. Also 8.8 % had granules casts, 9.2 had WBC, 3.9% had calcium oxalate crystals, and 3.9 % had amorphorus phosphate and others as shown on table 4c above.

Table 4d

Urine Dipstick (Urine Chemistry) outcome among 260 HIV and AIDS patients attending CTC at MNH

Items	Scanty	+1	%
Protein	5	2	2.7
Ketones	1	0	0.4
Glucose	0	0	0.0
Leukocyte esterase	0	0	0.0
Blood	1	0	0.4
Urobilinogen	0	0	0.0

Urine chemistry analysis in 260 patients, 2.7 % had protein (insignificant) in their urine. All other parameters were not significant (table 4d above)

Table 5.

Lower urinary tract symptom status of HIV and AIDS patients attending a CTC at MNH by age, gender, use of prophylactic antibiotic, use of ARV, alcohol, cigarette smoking, opportunistic infection, neurological symptoms, AIDS associated malignancy and hypertension.

Characteristic	Lower urinary tract symptoms					
1.Age groups (n=260)	**LUTS positive**		**LUTS negative**		**Total**	**p-value**
	No	**%**	**No**	**%**		
17-26	2	13.3	13	86.7	15	
27-36	43	44.3	54	55.7	97	
37-46	40	32.0	85	68.0	125	0.024
47.>	12	52.1	11	47.9	23	
2.Gender						
Male	44	37.9	72	62.1	116	0.95
Female	53	36.8	91	63.2	144	
3.ARV use						
Yes	82	36.0	146	64.0	228	0.23
No	15	46.8	17	53.2	32	
4.Antibiotic prophylactic use						
Yes	75	35.3	138	64.7	213	
No	22	46.8	25	53.2	47	0.13
5.Cigarette smoking						
Yes	6	66.6	3	33.4	9	
No	91	36.3	160	67.3	251	0.07

6.CD4+ count						
<200 cells/ml	38	39.1	59	60.9	97	0.63
>200 cell/ml	59	36.2	104	63.8	163	
7.Alcohol						
Yes	7	46.7	8	53.3	15	
No	90	36.7	155	64.3	245	0.44
8.Hypertension						
Yes	2	50.0	2	50.0	4	0.49
No	99	36.7	161	63.3	256	
9.Neurological symptoms						
Yes	8	27.6	21	72.0	29	0.34
N0	89	38.5	142	61.5	231	
10.AIDS associated malignancy KS						
Yes	3	50.0	3	50	6	0.67
No	94	37.0	160	63.0	254	
11.Opportunistic infection						
Yes	17	48.5	18	51.4	35	0.19
No	80	33.5	145	64.5	225	

In the age group of 17-26 years 2(13.3%) had LUTS and 13(86.7%) had no LUTS. In the age group 37 -46 years the number of people with LUTS was to 40(32%) and those who had no LUTS was 85(68%).Higher age was associated with LUTS. This finding was statistically significant ($p<0.05$)There was no significant difference in LUTS with reference to sex (male 37.9% and 36.8%) and the difference was not statistically significant. ($p=0.95$).

The proportional of patients who had no LUTS among those using ARV was 64% and those not on ARV was 53.2%.However this difference was not statistically significant (p=0.23)

In those patients who were using prophylactic antibiotics 35.3% had LUTS and 64.7% had no LUTS. Among 47patients who were not using prophylactic antibiotics 46.8% had LUTS and 53.2% had no LUTS .This suggest that use of antibiotic decreased LUTS. However this was not statistically significant. (p =0.13). Among those who were smoking cigarette 66.6% had LUTS and those who were not smoking 36.2% had LUTS. Therefore cigarette smoking was associated with LUTS but the difference was not statistically significant. (p=0.07). Among 97 patients who had CD4+ count less than 200cells /ml, 39.1% had LUTS whereas 60.9% had no LUTS. And in those patients, who had CD4+ count more than 200cells/ml, 36.2% had LUTS and 63.8% had no LUTS. Therefore, it was found that as CD4+ count increased risk of LUTS decreases but this was not significant statistically (p=0.63). Of 15 patients who were drinking alcohol 46.7% had LUTS and 53.3% had no LUTS.

Among those who were not drinking alcohol 38.5% had LUTS and 64.3% had no LUTS. Therefore use of alcohol was found to increase the risk of drinkers to LUTS but this was not statistically significant (p=0.44)

Four patients had Hypertension, 2 (50%) had LUTS and 2 (50%) had no LUTS. Of those who had no hypertension 36.7% had LUTS and 63.3 % had no LUTS. However this was not significant statistically (p=0.49).

Among 29 HIV and AIDS patients who had neurological symptoms 27.6% had LUTS and 72.4% had no LUTS. Of 231 patients who had no neurological symptoms 38.5% had LUTS and 61.5% had no LUTS. The proportion of LUTS in patients who had neurological symptoms was less than in that who had no neurological symptoms and this was statistically not significant (p=0.34) as shown above in table 5.

8. DISCUSSION

Lower urinary tract symptoms in HIV/AIDS patients are a frequently encountered problem (37.3%) among patients attending Care and Treatment Clinics for HIV. They significantly contribute to reduction in the quality of life of people living with HIV e.g. anxiety, sleep disturbance, restriction in daily and sexual activities and sometimes depression[37]. However, most often these symptoms are confused with urinary tract infection and sometimes this can lead to unnecessary treatment with antibiotics.
This study has attempted to identify some important factors that could influence the occurrence of lower urinary tract symptoms among patients attending CTC.

- **Baseline characteristics of patients attending CTC at MNH**

The findings of this study revealed that, the age between 27-46 years constitutes about 85% of all patients attending CTC. This could be explained by the fact that this group constitutes the sexually active population, hence there are likely to acquire HIV infection. Similar findings were recorded in the survey conducted at CTC in which the age group between 20-49 years constituted 76.5% of all patients enrolled in CTC in Tanzania [46].

The results also revealed that females were 55.4% compared to men who were 44.6% of all patients. Again this shows that women do seek for care and treatment services more than men. Results from Tanzania health indicator survey found women to contribute 65.7% in CTC compared to men. [46] Another explanation could be women are more infected with HIV compared to men. A survey conducted in Tanzania found that the prevalence of HIV among men was 6% and that among females was found to be 8 %. [46]

We see from this study, married people representing about 47% of patients attending CTC, this means that married couples constitute a bigger proportion of patients attending CTC compared to other marital status groups. These findings are in keeping with those found the national survey in which married people constituted 55.7% of the different marital status categories of patients with AIDS. [46] This emphasizes the dilemma that exists on how to address prevention of HIV among married couples. CTC enrolment of people with informal education is low compared to those with primary, secondary and college education. This could be explained by the fact that the more educated someone is, the more likely they will be to access information on availability of health services through media e.g. radio, newspaper, TV, leaflets, seminars, workshops etc.

The employed and petty traders contributed 69.5% of all attendees; the rest was contributed by unemployed, peasants and students. The selected sample truly represent the population of HIV and AIDS patients seen at our clinic in terms of age distribution, sex, marital status, level of education and employment. The results of this study could be generalized to all HIV and AIDS patients population.[47]

- **Prevalence and severity of LUTS among HIV and AIDS patients**

The overall prevalence of LUTS for all patients with mild, moderate and severe symptoms was found to be 37.3%; this was higher compared to previous studies which found the prevalence to be 16% and 18.7% respectively among patients who had mild, moderate and severe symptoms.[39, 48] In the present study prevalence seems to be higher than above mentioned studies because this study dealt with symptoms but those studies included signs, and urological investigation in obtaining the prevalence of LUTS so its was easy for them to exclude false positives. The majority of patients, about 77.4% had mild LUTS, 22.6% had moderate to severe symptoms.

The study also found that 30.8 % of patients with LUTS had irritative bladder symptoms, 55.7% had obstructive symptoms and the remaining 10.3% had other symptoms (dysuria and Heamaturia). A retrospective study done in France[35] found that irritative symptoms constituted 87% while the rest had obstructive symptoms. The difference in the two studies could be explained by the fact that, in the latter study both symptoms ,clinical examinations and urodynamic examinations were used in categorizing the severity while in this clinical ,symptoms and associated risk factors were investigated used to categorize the severity of LUTS

This study has also found that 31.0% of the patients had intermittency, 14.4% had incomplete emptying and 11.3% had frequency, 11.3% had nocturia 3.2 % had incontinence as their complaint. Those who had symptoms (incontinence, frequency) but their culture results turned to be negative were given Oxybutynin (Ditropan) 2.5 to 5mg once daily for 14 days then followed up after 2wks. .

Bacterial growth and their culture -sensitivity pattern

Among 260 patients who were involved in the study, 9.6% had bacterial growth when their urine samples were cultured and 90.4% had negative culture results. The bacterial growth pattern was as follows; Escherichia coli (5.4%), Staphylococcus aureus (1.5%), Klebsiella pneumoniae (1.2%), Pseudomonas aureginosa (1.2%) and Pseudomonas vulgaris (0.4%). However, this study has found that 60% of bacterial growth occurred in patients who had no LUTS and 40 % in patient in patients with LUTS,but this had no statistical significance(p=0.91). In a study done in homosexual HIV and AIDS patients found in bacteriuria was 8% and UTI in 20% . The organisms encountered were atypical i.e. Salmonella spp, Candida spp, Actenobacter calcoaaticus, CMV and Cryptococcus spp .[43]

Similar findings were encountered in an African –American study in USA whereby Escherichia coli was found in 25% of patients and 33 % had Pseudomonas aureginosa. The culture negativity encountered in the present study could be explained by the use of prophylactic cotrimoxazole against opportunistic organisms causing PCP and diarrhea.A similar explanation was also given in the African –American study.[31, 38, 49] Treatment of patients with UTI needs to be culture specific and long term to avoid organisms developing resistance to the drug [40]

- **Risk factors associated with LUTS**

Age was found to have an association with LUTS; the most affected group was the sexually active group which is the age between 26-46 years. Similar findings were found in a community study done in Boston.[48,52] The present study did not find a significant sex difference in developing LUTS, as in the study done in Boston [48]

In this study using ARVs was not found to be protective against LUTS. This could be explained by two reasons, one could be the fact that majority of the patients who were using ARVs (>90%) were on first line regimen which have not been implicated in causing urinary tract stones [50] It is also possible that being on ARVs is associated with good immunological competence hence making it less likely for someone to develop urinary tract infection and hence LUTS, as almost half of those who were not on ARVs had LUTS. From this study we see only a small proportion of patients who were on COT prophylaxis had LUTS, it is still a challenge to prove that unless culture and sensitivity is performed to rule out UTI since the two conditions almost have similar presentations, in which case culture and sensitivity results become of paramount importance in order to differentiate between the two.

A study done among African-American HIV and AIDS patients in the USA, it showed that the prevalence of LUTS was 16% and that of UTI was 17%.[39]

Cigarette smoking was found to be a risk factor of LUTS, with more than 60% of those smoking had LUTS. These findings are similar to those found in previous two studies done in USA whereby cigarette smoking and formal smokers were found to carry a increased risk of having LUTS.[39,50] The increased proportional of LUTS in cigarette smoker in this study could be explained by small number of smokers. However, this finding was not statistically significant (p =0.07) which could be explained by small proportion of smokers. Having CD4+ count more than 200cells/ml was found to be associated with decreased risk of LUTS in HIV/AIDS patients, this was also encountered in three other studies whereby low CD4+ count was found to be associated with urinary bladder areflexia, hyporeflexia and UTI.[34, 39, 50] This could be explained by immunological competence in people with high CD4+ cell counts.

There are was no association between drinking alcohol and LUTS .However, the number of patients who drunken alcohol was small, so no conclusions can be drawn from these findings. This could be resulted from a small proportion of patients who were taking alcohol (16%) as the clinic discourages concurrent use of ARV and alcohol. The study done in USA among Black-Americans found increased risk of developing LUTS among HIV patients taking alcohol, the findings were statistically significant, $p<0.05$.

In the US study, hypertension was also found to be a risk factor of LUTS. The present study has found that hypertension was not a risk factor of LUTS ($p>0.05$). But this could be explained by a very small number of patients who were known to be hypertensive and we were not measuring the blood pressure for those who denied being hypertensive. [39]

Among twenty nine patients who had neurological symptoms, 27.6% had LUTS and 72.4% had no LUTS. Statistically has been found to be not significant ($p>0.05$).

This is also contrary to retrospective studies done in USA and in France where neurological symptoms have been found to be risk factor of LUTS.[30,29,31,34] The difference in the two studies could be explained by both neurological examinations and urological investigations which were done to the HIV patients in the USA and France studies, hence many patients could be picked and the other reason could be neurological symptoms are related to prolonged use HAART.

Having opportunistic infections and HIV associated malignancy (KS and lymphoma) has been shown not be associated with of LUTS. This can be explained by few numbers of patients who had opportunistic infections and malignancy majority of patients (82%) were on prophylactic antibiotics. Prevalence of OIs was found to be 14% and this is comparable to other studies[10] and this again is explained by use of cotrimoxazole a prophylaxis for OIs in those patients who have CD4+ count less than 200cells/ml. [10]

- **Recommendations**

1. For those patients presenting with LUTS in CTC clinic neurological and Urological investigation should be considered.
2. There should be a protocol put in place at a CTC for the attending physician to follow when attending a patient with LUTS. Treatment protocol should be incorporate both laboratory and clinical findings
3. Large multi-central study need to be done whereby history, physical examination and urological examination could be done in order to establish prevalence of LUTS in HIV patients in Tanzania

- **Limitations of the study**

The amount of fund of TSH 1,000, 000/= allocated was no sufficient to cover high laboratory cost. It would also be appropriate to repeat culture for those patients who were culture positive and treated to see if there was a complete clearance of the bacteria. Also other drugs for LUTS and antibiotics which could have been given to patients preferably free and help smooth recovery to the patients

10. APPENDICES

10.1. Informed consent Form

ID no.....

Consent to participate in the study on the prevalence of lower urinary tracts symptoms and associated risk factors in HIV/AIDS patient at MNH

Greetings! My name is Dr Mugisha Clement .I am a postgraduate student at MUCHS, investigating the prevalence of Lower urinary tract symptoms and its risk factors in HIV/AIDS patients.

The purpose of the study; To describe prevalence and risk factors of lower urinary tract symptoms, also the bacteriological pattern of urine culture and sensitivity in HIV/AIDS patients attending CTC at Muhimbili National Hospital.

What participation involves:

If you agree to participate in the study, you will be interviewed, and a detailed clinical history regarding your illness will be requested. A urine sample will be requested from you.

Confidentiality:

All information collected on questionnaires will be entered into computer with identification number. The questionnaires will be handled with greater secrecy in order to maintain confidentiality.

Risks:

There is no risk associated with this study

Right to withdraw and alternatives:

Taking part in this study is completely voluntary choice. If you choose not participate in the study, you will continue to receive all services that you would normally get from the hospital.

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Benefits:

If you agree to take part in this study, you will benefit from knowing the Urinalysis and culture and sensitivity results of a collected specimen, and whenever you have culture positive results you will be prescribed medication and advised accordingly.

In case of any injury:

Apart from you providing us with a urine sample, we do not expect any harm.

Who to contact:

If you have any question about the study, you should contact Dr Mugisha C on 0748492332 If you have questions about your rights as a participant, you may contact Prof E. Lyamuya, Chairman of MUHAS Research and Publications Committee. P.O.BOX **65001 Dar es Salaam. Tel 2150302-6**

Signatures

Do you agree?

Participant agrees..... Participant does NOT agree.....

I ..... have read the content of this form .My questions have been answered. I agree to participate in this study.

Signature of participant.....

Signature of witness..... Date of signed consent.....

10.2. FOMU YA RIDHAA (SWAHILI VERSION)

Matatizo ya njia ya mkojo kwa wagonjwa walioathirika na virusi vya UKIMWI au wenye ukimwi.

Nambari ya usaili .....

Salaaam! Mimi naitwa Dr Mugisha Clement na ni mwanafunzi wa udhamili Chuo Kikuu cha Sayansi za Afya ..Nafanya utafiti wa kuchunguza dalili na matatizo ya njia ya mkojo na sababu zake kwa wagonjwa walio athirika na ukimwi.

Madhumuni ya utafiti

Kujua matatizo ya njia ya mkojo ,tunatarajia kusajili wagonjwa wapatao 250

Jinsi ya kushiriki

Kama utakubali kushiriki ,nita kuhoji maswali machache kuhusu ugonjwa wako na nitakuomba utoe sampuli ya mkojo wako kwa ajili ya uchunguzi zaidi.

Utunzaji wa siri

Taarifa zitatunzwa kwa siri kwa kutumia herufi au nambari bila majina ya mgonjwa

Madhara /Athari

Hakuna athari au madhara yoyote yanayotegemewa yatokanayo na utafiti huu.

Uhuru wa kushiriki ;

Kushiriki kwenye utafiti ni hiari yako.Unaweza kujitoa wakati wowote.

Kama utachagua kutoshiriki,utaendelea kupata huduma kama hapo awali kutoka clinic .

Faida ya utafiti

Ukishiriki kwenye utafiti huu , utaelewa kama /utachunguzwa kama una tatizo katika njia ya mkojo utashauriwa na na pia utatibiwa. Kuna kamati ya kusimamia udhibiti wa Utafiti

Taarifa

Endapo unahitaji kupata maelezo kuhusu haki zako au taarifa ,wasiliana na Dr Mugisha Clement 0784492332, au Prof E.lyamuya ,Mwenyekiti wa Kamati ya Utafiti S.L.P 651001,Dar es salaam., Simu2150302-6

Je unakubali kushiriki kwenye utafiti? (weka alama) vema ndiyo hapana Mimi ....., nimeelezwa/nimesoma maelezo

Haya. Maswali yangu yamejibiwa.

Nimekubali kushiriki kwenye utafiti huu

Sahihi ya mgonjwa .....

Sahihi ya ndugu/shahidi .....

Sahihi ya Mtafiti ..... .

Tarehe.....