DETERMINATION OF COMMONLY REPORTED SIDE EFFECTS AND THEIR MANAGEMENT AMONG HIV PATIENTS RECEIVING ANTIRETROVIRAL DRUGS IN DAR ES SALAAM REGION

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH (MPH) OF THE UNIVERSITY OF DAR ES SALAAM

SEPTEMBER 2005

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the University of Dar es Salaam a dissertation entitled: '*Determination of commonly reported side effects and their management among HIV patients receiving antiretroviral drugs in Dar es Salaam Region'* in partial fulfillment of the requirements for degree of Master of Public Health, of the University of Dar es Salaam.

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DECLARATION

I, Lucy Mlelwa declare that this dissertation is my own original work and that it has not been presented to any other University for a similar or any other degree award.

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ACKNOWLEDGEMENT

I am greatly indebted to thank my supervisor Dr. K.S. Mnyika for his valuable guidance, suggestions, criticisms, help and encouragement towards the production of this dissertation.

I would like to thank the Temeke, Kinondoni and Ilala district authorities, City Medical Officer for granting me permission to conduct this study in the district hospitals.

I would like to thank Prof E. P. Y. Muhondwa, Mr. Omari Minzi, and Mrs. Emma L. Msuya for their kind assistance, guidance, advice and encouragement during the development of the proposal and in the whole process of completing this work.

Thanks should also go to my classmates, MPH students at the School of Public Health and Social Sciences for their continuous encouragement that enabled me to finalize this course.

Many thanks to SIDA SAREC – in collaboration with the University of Dar es Salaam for sponsoring this important course and make it possible for me to acquire requisite skills and knowledge for the betterment of the profession and discharge of my duties.

I would also like to thank my beloved parents Mr. John Numanbi and Mrs. Mary P. John, my lovely husband Dr James Rwehabura and my children Joys and John for their moral support that enabled me to accomplish this course

Lastly, thanks should go to all patients and health care workers who provided consent to participate in this study, to all people who assisted me in one way or another to make my dissertation completed.

DEDICATION

I dedicate this work to my parents Mr. John Numambi and Mrs. Mary P. John who provided me with a good education foundation that brought me to where I am today, to my lovely husband Dr James E. Rwehabura whose moral support was vital for me to accomplish this work, and my children Joys and John.

ABSTRACT

The Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) pandemic poses one of the greatest challenges to global public health. Sub Saharan Africa is the world's most severely affected region. There were an estimated 34-46 million people living with HIV/AIDS globally in 2003. Two thirds of the global total number of people living with HIV/AIDS live in Africa. Tanzania is one of the countries affected severely by HIV/ AIDS epidemic in sub Sahara African countries. According to the World Health Organization (WHO), it was estimated that there were 1,810,000 people living with HIV in mainland Tanzania in the year 2003.

The introduction of HAART in developed countries has resulted in dramatic reduction in AIDS related morbidity and mortality among people living with HIV. However, ARV drugs are complicated and difficult for patients to follow as they can have serious side effects. Increased experience with HAART has led to detection of drug toxicities that may compromise adherence and necessitate discontinuation of treatment and alteration of effective regimens. In Tanzania, the experience with ART is very limited as there is yet no information that have been documented on patients' experience in terms of side effects

A cross sectional study was conducted in Dar es salaam region in the three district hospital of Mwananyamala, Temeke and Amana to determine the commonly reported side effects and their management among HIV patient receiving ARV

drugs. The study population involved a sample of 400 adults HIV outpatients on ARV drugs and 40 health care workers working in HIV clinics in the three district hospitals. A questionnaire consisting of open and closed ended questions was used to collect data. All HIV patients on ARV drugs and heath care workers were interviewed. Other information was collected from patient's record forms using a checklist.

Data were processed and analyzed using computer software programme Epi Info version 6. Data were analyzed by examination of distributions of frequencies of respondents' characteristics and variables, followed by examination of strength of association of dependent and independents variables using chi-squared test for contingency tables.

Results of this study revealed that the types of ARV drugs used by patients were based on standard treatment guideline. All types were first line drug regimens, however, second line drug regimens are not yet available. About 36% of HIV Patients on ARV drugs had experienced side effects. About 16% of patients experienced mild and moderate GIT side effects such as abdominal discomfort, nausea and vomiting. About 11% experienced mild moderate and severe hypersensitivity reactions presented by skin rashes, itching, and skin exfoliation. About 11% experienced peripheral neuropathy. Eighty percents of patients experienced mild and moderate CNS problems such as dizziness, insomnia nightmares. About 4% patients experienced mild and severe anemia. Few patients 5% experienced moderate and severe liver problems presented by elevation of

liver enzymes and jaundice. About 5% experienced other side effects such as high fever, lipodistrophy, swelling of face and limbs, pigmentation of nails, ear problems and chest tightening.

Exactly10% of patients, who had experienced side effects, had changed their ARV drug regimen. More than 67% of patients were aware of side effects associated with ARV drugs. Most health workers were aware on management of HIV patients.

This study recommends that MOH should make deliberate efforts to ensure that second line drugs are also available for alternative drugs in cases of severe side effects. Monitoring of HIV patients on ARV drugs should be improved in general for early detection of side effects and regular training should be conducted to raise health care workers' awareness on management of HIV patients. Further studies should be conducted to investigate long term and complicated side effects, treatment failure due to drug resistance as reasons for changing ARV drugs.

TABLE OF CONTENTS

ITEM ..... **PAGE**

Certification..... ii

Declaration iii

Copyright..... iv

Acknowledgement..... v

Dedication..... vi

Abstract..... vii

TABLE OF CONTENTS..... **x**

List of tables xiii

List of abbreviations..... xiv

CHAPTER ONE

1.0. INTRODUCTION..... 1

1.1. Background.....1

1.2. Statement of Problem..... 12

1.3. Research Questions..... 14

1.4. Rationale..... 14

1.5. Objectives.....15

1.5.1. Broad Objectives 15

1.5.2. Specific Objectives.....15

CHAPTER TWO

2.0. LITERATURE REVIEW.....17

CHAPTER THREE

3.0. METHODOLOGY 26

3.1. Description of Study Area..... 26

3.2. Study Design 26

3.3. Study Population..... 26

3.3.1. Study Setting.....26

3.3.2. Site Characteristics..... 27

3.4. Sample Size calculation.....29

3.5. Sampling Procedure.....30

3.6. Research Instrument.....31

3.7. Variables..... 31

3.8. Testing of Research Instrument.....32

3.9. Data Collection.....33

4.0. Data Processing.....33

4.1. Data entry 33

4.2. Data Analysis.....34

5.0. Ethical Clearance.....34

6.0. Informed Consent.....34

7.0. Study Limitations.....35

CHAPTER FOUR

4.0. RESULTS 36

CHAPTER FIVE

5.0. DISCUSSION..... 62

CHAPTER SIX

6.0. CONCLUSION AND RECOMMENDATIONS..... 74

6.1. CONCLUSION.....74

6.2. RECOMMENDATIONS 76

REFERENCES.....77

APPENDICES.....80

Appendix I: Informed Consent form.....80

Appendix II: Patient Questionnaire 82

Appendix III: Checklist of Questions 90

Appendix IV: Health workers Questionnaire 93

Appendix V: Informed Consent form (Swahili version).....96

Appendix VI: Patient Questionnaire (Swahili version).....98

LIST OF TABLES

Table 1: Distribution of the study population by socio demographic characteristics of HIV patients on ARV drugs 37

Table 2: Types of drugs used by HIV patients 40

Table 3: Distribution of types of ARV drugs used by HIV patients by sex.....41

Table 4: Side effects experienced by HIV patients on ARV drugs 42

Table 5: Side effects reported by HIV patients on ARV drugs 43

Table 6: Distribution of HIV patients on ART experienced side effects 44

Table 7: Distribution of HIV patients experienced side effects by ages 45

Table 8: Distribution of HIV patients who experienced side effects by .....46 types of ARV drugs used by HIV patients

Table 9: Patients' awareness on ARV drugs 47

Table 10: Monitoring of HIV patients on ARV drugs 49

Table 11: Investigations performed before and after initiation of ARV drugs 50

Table 12: Distribution of HIV patients who changed ARV drugs by sex 53

Table 13: Distribution of types of ARV drugs by HIV patients who changed ARV drug.....54

Table 14: Distribution of ARV drugs changed by alternative drugs prescribe....55

Table 15: Distribution of socio demographic characteristics of heath workers ...56

Table 16: Distribution of ages of health care workers by sex 57

Table 17: Distribution of health care workers cadre by sex 58

Table 18: Training on management of HIV patient and ARV drugs 59

Table 19: Monitoring of HIV patients on ARV drugs 59

LIST OF ABREVIATIONS

ABC	Abacavir
AIDS	Acquired Immunodeficiency Syndrome
AMMP	Adult Mortality and Morbidity Project
ARV	Antiretroviral
AZT	Zidovudine
CBC	Complete blood counts
CMB	Combivir (AZT + 3TC)
CNS	Central nervous system
CD4	Clustered Differential Antigen 4
ddI	Didanosine
DED	District Executive Director
DMO	District Medical Officer
EFV	Efavirenz
GIT	Gastro Intestinal Tract
HAART	Highly Active Antiretroviral Therapy
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
IDV	Indinavir
MOH	Ministry Of Health
MOI	Medical Officer In charge
MTCT	Mother to Child Transmission

MUCHS	Muhimbili University College Of Health Sciences
NACP	National AIDS Control Programme
NPAR	Neuropsychiatric Adverse Reactions
NRTIs	Nucleoside Reverse Transcriptase Inhibitors
NNRTIs	Non-Nucleoside Reverse Transcriptase Inhibitors
NVP	Nevirapine
PASADA	Pastoral Activities and Services for people with AIDS Dar es Salaam Archdiocese
PIs	Protease inhibitors
SQR	Saquinavir
STI	Sexually Transmitted infection
TB	Tuberculosis
UN	United Nations
UNGASS	United Nations General Assembly Special Session
WHO	World Health Organization
3TC	Lamivudine
D4T	Stavudine

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

HIV/AIDS situation globally

The Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) pandemic poses one of the greatest challenges to global public health. Sub Saharan Africa is the world's most severely affected region. In 2003, there were an estimated 34-46 million people living with HIV/AIDS globally. Two thirds of the global total number of people living with HIV/AIDS live in Africa. Today, about one adult in 12 African adults have HIV/AIDS (NACP, 2005).

HIV/AIDS situation in Tanzania

Since 1983 when the first cases of AIDS were reported in Tanzania, the HIV epidemic has spread rapidly to all districts and communities. HIV infection has spread throughout the country, affecting all sectors of the society (NACP, 2005).
A total of 18,929 AIDS cases were reported to the National AIDS Control Programme (NACP) from 21 regions during the year 2003. This resulted into a cumulative total of 176,102 reported cases since 1983 when the first 3 cases were identified in the country (NACP, 2003).

According to the World Health Organization (WHO), it was estimated that there were 1,810,000 people living with HIV; 840,000 males and 960,000 females in

mainland Tanzania in the year 2003. Four percent (754) of the AIDS cases reported were below 15 years of age and most of these were likely to have acquired infection through mother to child transmission (MTCT). The age group 20-49 years was the most affected for both sexes. The observed clustering of cases in the age group was thought to suggest that majority of infection occurred during adolescence. Data indicated high risk of infection among youth and higher vulnerability to infection among women. The predominant mode of transmission was heterosexual intercourse (76.8%) of all reported AIDS cases in the year 2003 (NACP, 2003).

Impact of HIV/AIDS

The impact of the HIV epidemic has been profound and has affected all sectors of the society. Today, HIV/AIDS is recognized not only as a major public health concern but also a social, economic and developmental problem in Tanzania as in most sub Saharan African countries (NACP, 2005).

Health impact of HIV/AIDS

In Tanzania, data from Adult Mortality and Morbidity Project (AMMP, 2002) showed that HIV/AIDS and Tuberculosis (TB) were leading causes of mortality in Hai, Temeke and Morogoro rural district. HIV/AIDS epidemic has interacted with other underlying public health problems; most notable Tuberculosis. TB remains one of the principle causes of death in persons with HIV infection worldwide. National TB rates have escalated over the past decade in sub Saharan Africa and South-East Asia (NACP, 2005).

Since the mid-1980s, in many African countries with well-organized programs, annual TB notification rates have increased fourfold, reaching peaks of more than 400 cases per 100,000 individuals. In some countries, up to 70% of patients with sputum smear–positive pulmonary TB are HIV-infected. It is reported that in countries of sub Saharan Africa most admissions are due to HIV related conditions including TB. Most urban, district and regional hospitals in Tanzania report a bed occupancy rate of up to 70% for HIV related conditions (NACP, 2005).

The HIV pandemic has reduced resources available for other health problems thus adversely affecting quality of health care services delivered in these countries. In addition, health personnel are affected as well by the pandemic resulting in human resource crises in hospitals at a time that more resources than ever needed to start care and treatment programs (NACP, 2005).

Economic impact of HIV/AIDS

HIV/AIDS negatively affects economic growth on one hand. On the other, a weak economy makes it difficult for nations and individuals to mount adequate and comprehensive responses to the epidemics. Reports show that poverty is a powerful co-factor for the spread of HIV/AIDS. The economically and socially disadvantaged women, youth and other marginalized groups in the society, are disproportionately affected by HIV/AIDS. Ill health and death due to AIDS are reported to have reduced agricultural labour force, productivity and disposable incomes in many families and rural communities. Data from Kagera, one of the

regions most severely affected by HIV/AIDS in Tanzania, indicate that the annual Gross Domestic Product (GDP) declined from USD 268 to 91 between 1983 and 1994 (NACP, 2005).

Social impact of HIV/AIDS

AIDS is widely spread in both urban and rural communities and mostly affects persons at the peak of their sexual and economic activity. Death of young adults often means loss of a father, mother, or both and family's income generator. Studies conducted in Arusha, Kagera and Mwanza region show a serious and growing breakdown of social network, which have hitherto sustained to African societies. Materialistic practices are on the increase; orphans are not only subjected to material, social and emotional deprivation, but also lack of opportunities for education and health care. Widows and orphans are deprived of their inheritance rights by relatives through the application of outdated traditional and customary laws. Both widows and widowers are often blamed for the premature deaths of their spouse (NACP, 2005).

Scaling up antiretroviral drugs in poor resource settings

It has been reported that the advent of potent antiretroviral (ARV) drugs in 1996 has changed the way people in the world's richest countries view HIV /AIDS. Although these treatments are not a cure and present new challenges of side effects and drug resistance, they have dramatically reduced rates of mortality and morbidity, improved quality of life and revitalized communities (WHO, 2003).

Unfortunately most of 42 million people in the world living with HIV /AIDS reside in the developing world and do not share this vastly improved prognosis. WHO estimated that about 6 million people in developing countries are in need of sustaining ARV therapy, but only about 350,000 persons are being treated and one third of these live in Brazil (WHO, 2003).

In the wake of the International AIDS Conference in Durban 2000 and United Nations General Assembly Special Session (UNGASS) in 2001, the issue of disparity between treated and untreated, rich and the poor was addressed and came up with the resolution of expanding access of antiretroviral drugs to people living with HIV /AIDS (WHO, 2003).

The world recognized the pressing morals, social, political and economic imperatives to expand access to antiretroviral drugs to many more millions of people living with HIV /AIDS as soon as practicable, and began to mobilize the great global alliance which United Nations (UN) Secretary General had called for to achieve the UNGASS goals. The first edition of WHO recommendations were published in 2002 and updated in 2003 because of new scientific data and the increasing reality of ART scale-up in many countries (WHO, 2003)

Updated and simplified guidelines were meant to be a cornerstone of the WHOs' 3 x 5 plans which seeks to bring about 3 million persons into treatment by the year 2005.

The topics addressed in these guidelines include Antiretroviral Therapy (ART) and what regimens to continue if treatment needs to be changed. It also addresses how treatment should be monitored with specific reference to the side effects of ART and specific recommendations for certain patient groups (WHO, 2003).

Management of HIV patients using ARV drugs in Tanzania

After a decade of slow progress in treatment of HIV infection, there have been dramatic advances in the development of ARV drugs in the last few years. This now offers extended patient survival and improved quality of life.

Tanzania now has a Care and Treatment plan for people living with HIV/ AIDS as in the strategies in the health sector response to HIV/AIDS epidemic. The goal is to ensure that about 400,000 people living with HIV/AIDS get ARV drugs by the year 2005 (NACP, 2005).

Types of ARV drugs

The current ARV drugs used fall into three categories;

1 Nucleoside Reverse Transcriptase Inhibitors (NRTIs), Zidovudine (AZT), Lamivudine (3TC), Didanosine (ddI), Stavudine (d4T), Abacavir (ABC), Tenofovir (TNF).

2 Non Nucléoside Reverse Transcriptase Inhibitors (NNRTIs), Niverapine (NVP), Efavirenz (EFV).

3 Protéase Inhibitors (PIs), Saquinavir (SQR), Indinavir (IDV) Retinovir (RTV) (NACP, 2005 ; Montessori et al, 2004).

Recommended ARV drugs in Tanzania

The use of single drugs in the treatment of HIV infection is not recommended in Tanzania and indeed in other countries all over the world. New and follow up patients use combinations of drugs. A triple therapy consisting of two NRTIs combined with one medication from either of the two remaining classes of NNRTIs or the PIs are used (NACP, 2005; WHO, 2003).

Recommended first line ARV combination regimen for adults and adolescents

MOH recommends four different combinations of drugs

1. D4T + 3TC + NVP Fixed dose combination Triomune 30 or 40 depending on body weight less than or above 60 kg respectively.

Unless contraindicated, all patients will commence therapy on

D4T + 3TC + NVP.

However, patients can start on

2. AZT +3TC +NVP If there is peripheral neuropathy.
3. D4T +3TC +EFV If there is TB and anaemia (Hb < 7.5gm/dl)
4. AZT + 3TC + EFV If there is TB and no anaemia (NACP, 2005).

Recommended second line ARV drug regimen for adults and adolescents.

1. Abacavir 300 twice daily / Lopinavir / Ritonavir 133.3/33.3mg (Kaletra) twice a day and didanosine 200mg two tablets a day on an empty stomach.

2. Abacavir 300mg twice daily / Saquinavir / Ritonavir (SQV 1000 b.d mg plus RTV one100mg cap b.d.

Antiretroviral therapy for individuals with tuberculosis co- infection

WHO recommends that people with TB / HIV co- infection complete their TB therapy prior to beginning ARV treatment.

- Unless there is a high risk of HIV disease progression and death during the period of TB treatment i.e. CD4 cell count < 200/mm^3 or disseminated TB is present.
- Pulmonary TB and CD4 cell count < 50 / mm^3 or extra pulmonary TB, Start TB therapy and ARV regimen simultaneously. (D4T or AZT + 3TC + EFV).
- Pulmonary TB and CD4 cell count 50- 200 / mm^3 or signs of clinically advanced HIV infection. Start TB and ARV regimen after completing 2 months of TB therapy. (D4T or AZT + 3TC + EFV).
- Pulmonary TB and CD4 cell count > 200 / mm^3 or total lymphocyte count > 1200 / mm or sign of clinical advanced HIV infection. Treat TB monitor CD4 cell count if available. Start ART after completion of TB treatment (WHO, 2003; NACP, 2005)

Criteria for initiating ARV therapy in adults and adolescents

There are 3 classes of individuals who are clinically eligible to begin treatment

- WHO Stage IV disease irrespective of CD_4 cell counts.
- Advanced WHO Stage III disease.
- WHO stage I, II or III with CD4 cell count < 200 / mm^3 (WHO, 2003; NACP, 2005; Saag, 2004).

Monitoring of patients on ART

In Tanzania, CD4 + T- lymphocytes count is a gold standard method used to determine the time for initiation and change of therapy. Each patient should have a baseline CD_{4+} T- Lymphocytes count and (viral load if possible) done before initiating treatment. CD4 + T- Lymphocytes count should then be repeated at least every 6 months. Treatment will in most cases be associated with weight gain and reduced morbidity from opportunistic infections and improvement in the quality of life. Appearance or persisting opportunistic infections, or lack of weight gain, may indicate treatment failure and so the need to consider changing regimens.

Treatment is to be considered successful if the viral load decreases by 10 to 100 fold from the baseline level. However, in most cases CD4 cell count will be used instead of viral load thus a rise in CD4 + T- lymphocyte count will indicate success. Treatment failure will be indicated by a 30% fall in CD4 + T- lymphocyte count (NACP, 2005).

Clinical and laboratory monitoring of patients

Patients will attend the clinic monthly to collect medication and to be seen by clinicians (medical officers, clinical officers or assistant medical officer) to monitor drug tolerance, advent events and adherence. All patients should be seen by clinicians at 2 weeks after ARV initiation to check for adverse events, do more blood tests and to escalate the NVP dose. Clinicians should see patients at 4, 8 and 12 weeks and 3- monthly thereafter if well. If not well, patients would need to be seen more frequently as determined by the treating clinician. Blood samples are to be taken as per schedule. CD4 count will be done 6- monthly while patients are on the first line regimen (NACP, 2005; Montessori at al 2004).

Changing of ART

ART should be stopped and or changed when there is evidence of

- Toxicity or intolerance to one or all drugs.
- Treatment failure as evidenced by the patient becoming symptomatic and progressive decline of CD4 cell count and rise of viral load or both despite of good adherence to antiretroviral treatment
- Pregnancy, during the first trimester of pregnancy (NACP, 2005; WHO, 2003).

Changing of ART because of toxicities

The general recommendation is that when changing a patient regimen due to toxicity, only the toxic drug(s) should be replaced (NACP, 2005; WHO, 2003).

Side effects of ARV drugs and their management

Side effects or toxicities caused by ARV drugs are classified into 3 categories.

First category

Symptoms are mild and transient which often require patient assurance that these symptoms are common and will decrease over time. ARV interruption is seldom indicated in this situation. These can be mild headaches, mild gastric upset, nausea, fatigue and the central nervous system disturbances seen with Efavirenz (NACP, 2005; Montessori et al 2004).

Second category

Symptoms are more severe and often respond to some medical intervention. These include more severe gastric upset with nausea and vomiting, more severe headaches and mild peripheral neuropathy. These symptoms can often be successfully treated with anti-emetic, anti–diarrhoea medicines, analgesics, neuroleptic (amitriptyline) and other medicines. ARV interruption is usually not indicated in this situation and often-symptomatic treatment is only temporary (NACP, 2005; Montessori et al 2004).

Third category

Severe symptoms in which, ARV drug regimen must be stopped and replaced by alternative drugs. These include anaemia (hemoglobin < 7.5gm/dl or a falling hemoglobin, (drops by 2gm/dl) as can occur with the use of AZT. Severe symptoms noted in the first two categories, can sometimes lead to the stopping

ARV drug due to severe toxicities such as, nausea with severe discomfort and minimal intake for 3 or more days, vomiting all intake in 24 hours or dehydration due to vomiting, severe headache not responsive to non narcotic analgesics or fatigue reducing activity by more than 50%. In this situation one or more ARV drugs are replaced by another (NACP, 2005; Montessori et al 2004)

1.2. Problem Statement.

The introduction of Highly Active Antiretroviral Therapy (HAART) has resulted in dramatic decline in morbidity and mortality among patients infected with HIV. This is largely because ARV combination therapy can suppress plasma HIV viral load below detectable limits and cause gradual elevation in CD4 cell counts resulting in improved immune status for responsive patients who are compliant with therapy. These drugs however are not without side effects (Lewis, 2003).

ARV drugs are complicated and difficult for patients to follow as they can have serious side effects. All ARV drugs can have both short –term and long-term side effects. The risk of specific side effects varies from drug to drug, class to class and from patient to patient (Dietrich, 2003).

Furthermore, prolonged treatment with ARV combination regimen can be difficult to sustain because of problems with adherence and toxic effects. Increased experience with HAART has led to detection of drug toxicities that may compromise adherence and necessitate discontinuation of treatment and alteration of effective regimens (Dietrich DT, 2003).

Up to 25% of HIV, patients discontinue their initial HAART regimen because of treatment failure i.e. inability to suppress HIV viral replication to below the current limit of detection, 50 copies / ml. Toxic effects or non-compliance occur within the first 8 weeks of therapy (Montessori *et al* 2004).

In Tanzania a programme of providing free ARV drugs to people infected with HIV has been introduced recently. The experience with antiretroviral drugs is limited and there is yet no information that has been documented about the patient's experience in terms of side effects.

Patients may be taking drugs in spite of their serious side effects or they may decide to do some other modifications in order to cope with the situation because they value the drugs. This study was conducted to determine patient's experiences in terms of side effects and the types of antiretroviral drugs used by patients.

This study was conducted to determine whether side effects are reported and acted upon by their doctors, which should be reflected in changes in medication.
The study was conducted to determine the extent of monitoring of patients receiving ARV drugs.

Patients need to be counselled in detail on the potential side effects so that they are in the position to recognize side effects and to consult physician in time. This can save lives and irreversible damages caused by side effects can be prevented

through early diagnosis. Therefore, this study also was conducted to determine patients' awareness on ARV drugs.

1.3. Research questions

The study addressed the following research questions:

What were the socio-demographic characteristics of HIV patients receiving antiretroviral drugs?

What types of ARV drugs did HIV patients use?

What side effects did HIV patients receiving ARV drug experience?

What follow up systems were in place for monitoring HIV patients receiving ARV drugs?

What was the level of HIV patients' awareness on the use of ARV drugs?

What were reasons for changing ARV drug regimen?

What was the level of health workers' awareness on management of HIV patients?

1.4 Rationale

Documentation of side effects would enable the Government to select appropriate first line and second line drugs regimen when revising treatment guideline in future in cases of severe side effects and treatment failure.

The study would help physicians gain a working knowledge of ARV side effects and their management with ultimate goal of improving tolerability and

effectiveness of HIV/AIDS treatment, promoting early recognition and reversal of potentially serious side effects

An understanding of the drug specific, class specific and general toxicities and side effects of antiretroviral drugs would help the physicians to select appropriate treatment regimen to individual patients.

Results of monitoring of HIV patients on ARV in routine clinical practice would provide important information that can be used to improve the management of HIV/AIDS patients receiving ARV therapy

1.5. Study Objectives.

1.5.1. Broad Objective.

To determine commonly reported side effects and their management among HIV/AIDS patients receiving ARV drugs in Dar es Salaam.

1.5.2. Specific Objectives.

1. To determine types of ARV drugs used by HIV patients
2. To determine side effects experienced by HIV patients receiving ARV drugs
3. To determine the proportion of HIV patients receiving ARV drugs who experienced side effects.
4. To determine HIV patient's awareness receiving ARV drugs.
5. To examine monitoring systems of HIV patients receiving ARV drugs.

6. To determine management of side effects reported by HIV patients receiving ARV drugs.
7. To determine proportion of HIV patients who had changed ARV drug regimen due to side effects.
8. To determine heath care workers' awareness on management of HIV patients.

CHAPTER TWO

2.0. LITERATURE REVIEW

The introduction of HAART has resulted in dramatic declines in morbidity and mortality among people living with HIV. This is largely because ARV combination therapy can suppress plasma HIV viral load below detectable limits and cause gradual elevation in CD_4 cell counts resulting in improved immune status for responsive patients who are compliant with therapy. These drugs however are not without side effects (Lewis, 2003).

A study done by Saag, 2004 reported that available data continue to support the practice of not starting therapy for asymptomatic patients who have CD4 cell count above 350/ml. Initiation of antiretroviral therapy is considered below CD4 cell count 350/ml, but before the CD4 cell count drops to 200/ml.

One of the drug classes used in HAART is NRTIs, which commonly forms the backbone of ARV cocktail; this class includes zidovudine (AZT), lamivudine (3TC), didanosine (ddi) stavudine (D4T), abacavir (ABC) and the newly released nucleotide analogue tenofovir (TVR).

Two NRTIs are often combined with 1 medication from either of the 2 remaining classes, the NNRTIs and the (PIs).

The NNRTIs class comprises Nevirapine (NVP) and Efavirenz (EFV).

Protéase inhibitors comprises of Indinavir (IDV), Saquinavir (SVR), and Retinovir (RVR) (NACP, 2005 ; Montessori *et al,* 2004).

Each of 3 traditional classes of ARV drugs (NRTIs, NNRTIs and PIs) has therapeutic set of toxicities that are not found with the other drug classes. On the other hand, lipodystrophy, which was thought to be specific to PIs, is now known to be common to all three classes of drugs. An understanding of drug specific, class specific and general toxicities and side effects of antiretroviral drugs will help the clinicians tailor treatment regimens to individual patients (Rawrings, 2004).

A study conducted by Carry, 2000 reported that ARV toxicity is an increasingly important issue in the management of HIV infected patients. With the sustained major declines in opportunistic complications, HIV infection is a more chronic disease and so more drugs are being used in more patients for longer periods. Side effects associated with ARV drugs include mitochondrial toxicities, hypersensitivity and lipodystrophy.

Up to 25% of HIV patients discontinue their initial HAART regimen because of treatment failure, i.e. inability to suppress HIV viral replication to below the current limit of detection, 50-copies/ ml of viral load. Toxic effects or non compliance occur within the first 8 weeks of therapy (Montessori *et al* 2004).

A study conducted by Montessori *et al*, 2004 on adverse effects of antiretroviral therapy for HIV infection reported that, ART can have a wide range of adverse effects on the human body. Common but mild adverse effects occurring early in most antiretroviral regimens include gastrointestinal effects such as bloating, nausea and diarrhea, which may be transient or may persist throughout therapy. Other common nuisance adverse effects reported are fatigue and headache caused by Zidovudine and nightmares associated with Efavirenz (NACP, 2005).

Several uncommon but more serious adverse effects associated with antiretroviral therapy include AZT associated anemia and D4T associated peripheral neuropathy.

PIs are associated with retinoid toxicity and NNRTIs are associated with hypersensitivity reactions (NACP, 2005; Montessori *et al,* 2004).

However, the serious nature of adverse effects includes lactic acidosis, hepatotoxicity, hyperglycemia, hypercalcemia, fat maldistribution, hyperlipidemia bleeding disorders, osteoporosis and skin rash (Montessori *et al,* 2004).

Rash is a common adverse effect of the NNRTIs, particularly NVP. Approximately 16% of patients taking this agent experience a mild to moderate maculopapular rash, with or without pruritus, on the trunk, face and extremities within the first 6 weeks on therapy. Although most rashes are self-limited, NVP should be discontinued if rash is severe or accompanied by constitutional symptoms. Severe rashes occur in about 7% of NVP treated patients, mainly in

the first 4 weeks of treatment including Stevens Johnson Syndrome and toxic epidermal necrosis in less than 1% of all patients treated with NVP (NACP, 2005; Montessori et al 2004).

Routine laboratory monitoring should be done approximately every 3 months to determine whether the patient has asymptomatic abnormalities. Monitoring laboratory tests include complete and differential blood counts and measurement of electrolyte, createnine, liver transaminase, bilirubin and amylase levels. Patients should be monitored at regular intervals (approximately every 3 months) for dyslipidemia, diabetes and lipoatropy (NACP, 2005; Montessori et al 2004).

A study conducted by Lochet, 2003 to assess the outcome of neuropsychiatric adverse reactions (NPAR) that develop after initiation of Efavirenz (EFV) therapy, the late NPAR after a three month treatment period and the impact of NPAR on patients' quality of life in a real life population revealed that, the main late NPAR were sleep disorders, abnormal dreams 24%, nocturnal waking 19.6%, insomnia 17.8%, cognitive disorders; memory disorders 23%, impaired concentration 18.9%, anxiety 15.5%, mood disorders such as sadness 19.3% and suicidal ideations 9.2%. Global neuropsychiatric discomfort was moderate to severe in 23% of patients after a 3-month treatment period. It was concluded that, NPAR occur mainly during the first month of EFV therapy but often persist thereafter. A significant percentage of patients reported suicidal ideations at the

time of the study. It was suggested that there is a need for routine screening for NPAR among patients receiving EFV therapy and better management.

Another study conducted in German by Lesho, 2003 on managing issues related to ART reported similar results that, ARV regimens are complicated and difficult for patients to follow and they can have serious side effects such as osteonecrosis and bone demineralization. PI's therapy has been associated with hyperlipidemia, hyperglycemias, gastrointestinal symptoms, and body fat distribution abnormalities while NNRTI's can cause rashes and hepatotoxicity. NRTIs can cause lactic acidosis, hypersensitivity reactions, neuropathies, pancreatitis, anaemia and neutrogena. Malabsorption of drugs can occur if antiretroviral agents are taken improperly with regard to meals or if they are taken with certain other drugs or herbal remedies. Some common prescribed drugs can cause dangerous drug toxicities if they are taken together with ARV medication (Lesho, 2003).

A study conducted by Dietrich DT, 2003 reported that HAART has resulted in dramatic decline in morbidity and mortality among patients infected with HIV. Increased experience with HAART has led to detection of drug toxicities that may compromise adherence and necessitate discontinuation of treatment and alteration of otherwise effective regimens. The major long-term complications associated with NRTI use are, lactic acidosis, and hepatic steatosis. Others are hepatotoxicities, pancreatitis, lipodistrophy, neuropathy and hematological toxicities.

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A Study done by Dietrich, 2003 on managing ARV associated liver disease reported that, the use of all potent drugs is associated with toxicities and antiretroviral drugs are no exception. ART associated hepatic toxicity is of increasing concern in the management of patients with HIV/AIDS. Liver toxicity has been reported in some HIV infected patients being treated with drugs from all these classes of ARV drugs i.e. PIs, NRTIs and NNRTIs. Although the majority of cases involve asymptomatic elevation of liver enzymes, severe and in a minority of cases, life threatening, and liver disease has been reported in patients treated with ARV drugs. Knowledge of the possible cause of liver toxicity, and ways to avoid it should reduce the risk of developing hepatotoxicity (Dietrich, 2003).

A study conducted by Nunez *et al*, 2005 reported that hepatotoxicity is a relevant adverse effect derived from the use of ARV drugs that may increase the morbidity and mortality among treated HIV – infected patients and challenges the treatment of HIV infection. Although several ARV drugs have been reported to cause fatal acute hepatitis, most often cause an asymptomatic elevation of transaminase levels. Liver toxicity is more frequent among subjects with chronic Hepatitis C virus (HCV) and Hepatitis B virus (HBV) co infections and alcohol users. The incidence of liver toxicity is not well known for most of the ARV drugs. Fatal cases of acute hepatitis linked to the use of HAART have been reported across all families of ARVs. Acute hepatitis is related to hypersensitivity reactions in the case of NNRTIs to mitochondria toxicity in the case of nucleoside analogues. Alcohol intake and use of other drugs are other co-factors that increase the

incidence of transaminase level elevation among HIV- infected patients. The management of liver toxicity is based mainly on its clinical impact, severity and pathogenic mechanism. Although low grade HAART- related hepatotoxicity most often spontaneously resolves, severe grades may require discontinuation of the ARVs, for example when there is liver decompensation, hypersensitivity reaction or lactic acidosis (Nunez, 2005).

A study conducted by Roca et al, 2000 to evaluate adherence, side effects and efficacy of a modality of HAART in HIV- infected patients involved 65 patients receiving stavudine and lamivudine plus nelfinavir. Fifty-three participants (81%) had history of IV drug use. Patients were evaluated at 3 months intervals. Number of patients who stopped ARV regimen and adverse effects to drugs were assessed after a median follow up of 12 months and results showed that discontinuation of treatment took place because of refusal to take medication in 11 participants (17%) and because of side effects in 7 participants (11%). It was concluded that refusal to take medications and side effects were reasons to stop therapy (Roca *et al,* 2000).

A study conducted by Hartmann *et al,* 2005 to examine characteristics of Efavirenz and Nevirapine – associated rashes reported that Efavirenz and Nevirapine are frequently used drugs in ART and rashes are common side effects of these drugs. The study involved 662 HIV – infected patients (Efavirenz: 325, Nevirapine: 337) to determine incidence, duration, cross – reactivity, and outcome upon exposure. Results showed that, of the treated patients, 4.5% (n=30)

developed rashes (Nevirapine: 2.4% and Efavirenz: 6.4%). In four patients, treatment was not interrupted. Three patients were exposed to the initial drugs without any side effects. However, it was concluded that therapy with Nevirapine or Efavirenz does not have to be interrupted if rashes exhibit no blistering, mucosal manifestation, or systemic side effects (Hartmann *et al,* 2005).

A study conducted in Ethiopia by Habtegiorgis, 2003 on evaluation of antiretroviral treatment in two private medical centers involved 33 patients receiving ARVSs for a mean duration of about 4 months. Twenty-three (69.7%) were males and 10 (30,3%) were females and mean age was 38 years. Fifteen (45.5%) were married, fourteen (40.7%) were single, one (3%) divorced, and there was no record for the other three (9.1%). Fifteen (45.5%) were businessmen, seven (21.2%) were private employees, four (12.1%) civil servants and in the remaining seven (21.2%) their occupation was not recorded. The decision to initiate ARV therapy was entirely based on the presence of symptomatic HIV disease. CD4 + lymphocyte count was done in 24 (72.7%) and basic hematological tests were done for all. However, biochemical investigations were incomplete in all forms. Triple therapy was started for all patients and the cost was covered by their family in eleven (33%), by the patients in twenty-two (66.7%) side effects of the drugs were noted in ten (30.3%) that resulted in change of the regimen in the two and drug interruption in one. Twenty-three patients (69.7%) were noted to improve while nine (27.3%) remained the same and death occurred in one (3%). Standard triple therapy was used in all patients in this study and symptomatic HIV disease was the reason for initiation of treatment. The

improvement observed was not substantiated by immunologocal or virological parameters. Thus, the impacts of ARVs could not be measured and the response documented in the study could be due to effective treatment of opportunistic infections. Hence a standard protocol should be developed based on the minimum set-up required for initiation of ARV therapy.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area

The study was conducted in Dar es Salaam region in the three districts of Ilala, Kinondoni and Temeke

3.2 Study Design

A cross sectional study was undertaken involving HIV out patients receiving ART and health care workers working in HIV clinics in the three district hospitals of Dar es Salaam region.

3.3 Study Population

The study population involved HIV out patients receiving ARV drugs (adults and adolescents, both females and males) and health care workers working in HIV clinics (Doctors, Nurses, Pharmacists and Lab technicians) in the three district hospitals

3.3.1 Study Setting

The study was conducted in public hospitals in the three district hospitals (Temeke, Amana and Mwananyamala). These hospitals were able to provide free ARV drugs to patients infected with HIV under supervision of health care workers.

3.3.2 Site Characteristics

This study was conducted in Dar es Salaam city. This is the largest city in Tanzania and is the main business centre in the country. Dar es Salaam region has three districts of Ilala, Kinondoni and Temeke.

The city is situated along the Indian Ocean, bordered by the Coastal Region on the west, north, and south. Dar es Salaam is the second largest harbor along the eastern border of the Indian Ocean, after Durban harbor of South Africa. The city can be accessed through the ocean, airport, railways TAZARA, TRC and through Nyerere, Kilwa, Morogoro, and Bagamoyo roads.

The city has a total population of 2, 497, 940, of whom males are 1,261,077 and females are 1,236,863. Total household number is 596,264. Average household size is 4.2 and growth rate from 1988-2002 is 4.3% (Population Census, 2002). The city has a mixture of people mainly being Tanzanians of different tribes and foreigners who reside in Dar es Salaam.

Dar es Salaam is one of the most hit regions by HIV/AIDS in the country. It has AIDS case rate of 88.9 /100,000 population for the year 2003 being the third, the first is Kagera, followed by Arusha. It has a cumulative AIDS case of 26,818 from 1993-2003 (NACP, 2003).

Kinondoni district

The area of Kinondoni is 531 square km covering both rural area and urban area. Its total population is 1,088,867, of whom males are 549,929, females are 538,938 (Population Census, 2002). Mwananyamala hospital has 1000 HIV patients attending HIV outpatient clinic and 350 patients are on ARV drugs. Daily clinic attendance is estimated to be 60-70 patients.

Ilala district

Its total population is 637,573, of whom males are 321,903, females are 315,255 (Census, 2002). Amana hospital has 900 HIV patients attending HIV clinic and 350 patients are on ARV drugs. Daily clinic attendance is estimated to be 40-50 patients.

Temeke district

Its total population is 771,500, of whom males are 389,245; females are 382,255 (Population Census, 2002). It has a total number of 553 HIV patients attending HIV clinic and 271 patients are on ARV drugs. Daily clinic attendance is estimated to be 50-60 patients.

Each of the three district hospitals has 4 doctors, 8 nurses, 2 laboratory technicians and 2 pharmacists working in HIV clinic Health care delivery system in Dar es Salaam comprises of both formal and informal sectors. Formal sector include both public and private health facilities.

Public health facilities in Dar es Salaam include Muhimbili National hospital, specialized hospitals (Ocean road cancer institute, Muhimbili orthopaedic institute), district hospitals (Amana, Temeke and Mwananyamala), Lugalo military hospital, health centers and dispensaries. In Dar-es Salaam there are six hospitals selected by the MOH to provide ARV drugs to HIV patients (Amana, Temeke, Mwananyamala, Muhimbili National Hospital, Lugalo military hospital and PASADA (Non Governmental Organization owned by Roman Catholic Church.) It is located in Chang'ombe in Temeke district.

3.4. Sample Size calculation

Sample size was calculated as follows:

$$n = \frac{4\,p\,(100- p)}{\varepsilon^2}$$

Where n = sample size

Since the proportion of HIV patients receiving ARV drugs who experienced side effects was not known, the proportion was assumed to be 50%

ε^2 = margin of error = 5%

Therefore: $n = \frac{4 \times 50\,(100 - 50)}{5^2}$

$n = 400$

Thus, a sample of 400 HIV patients on ARV was included to participate in the study.

3.5 Sampling Procedure

Sampling of study sites

The study sites involved public hospitals (three district hospitals), which were selected on the basis that they are included in the MOH programme of providing free ARV drugs to HIV patients in the city of Dar es Salaam. Majority of people in Dar es Salaam attend public hospitals rather than private hospitals due to low income whereby they cannot afford to pay for health services in private hospitals, therefore, it was easier to obtain the required sample size in a short period of time.

Sampling of HIV Patients

Daily clinic attendance of HIV patients on ARV drugs was estimated to be 10-20 patients for each hospital. A convenient sample of 400 patients receiving ARV drugs was obtained from the three district hospitals. All HIV patients on ARV drugs who attended clinic during the days of data collection were interviewed. A total sample of 400 HIV patients were recruited, i.e. Mwananyamala hospital (150), Amana hospital (100) and Temeke hospital (150).

Sampling of health workers

There were 51 health care workers working in HIV clinics in the three district hospitals, for each hospital, (4 doctors, 8 nurses, 2 laboratory technicians, 2 pharmacists and 1 attendant). A sample of 40 health care workers working in HIV clinics who were on duty during days of data collection were interviewed.

3.6. Research Instrument

Data were collected using a questionnaire, which was translated in Swahili that focused on dependent and independent variables. These included, socio-demographic characteristics of HIV patients receiving ARV drugs, types of antiretroviral drugs used by HIV patients, follow up systems put in place for monitoring HIV patients receiving ARV drugs, side effects experienced by HIV patients receiving ARV drugs, patients awareness on ARV drugs, reasons for changing ARV drug regimen and health workers' awareness on management of HIV patients.

A checklist of questions was also used to collect data from patients' record forms on;

- Types of ARV drugs used
- Monitoring of patients before and after initiation of ART.
- Information of side effects reported by patients on ARV drugs
- Management of side effects reported by patients

3.7. Variables

Independent variables.

Social demographic characteristics

Age

Sex

Education level

Marital status

Residence

Occupation.

Religion

Type of antiretroviral drugs used by the HIV patients

Follow up systems for monitoring HIV patients receiving ARV drugs

Management of side effects experienced by HIV patients receiving ARV drugs

Patients' awareness on ARV drugs.

Health care workers' awareness on management of HIV patients.

Dependent variable

Side effects experienced by HIV patients receiving ARV drugs

Changing ARV drug regimen because of side effects.

3.8. Testing of Research Instrument

Pilot testing of the study instrument was conducted in the first week of June 2005 in Muhimbili National Hospital, which was not included in the study. Both health care workers working in HIV clinics and patients on ART were interviewed and information obtained was recorded in the questionnaires. Other information was collected from patient's files record forms using a checklist. The aim of pre-testing was to test to what extent the target audience would understand the tool and if the information required would be obtained.

3.9. Data Collection

Data was collected in June and July 2005 using a questionnaire comprising of open and close-ended questions and a checklist. Research assistants were recruited and trained by the principal investigator for one day on the use of the questionnaires and checklist for data collection.

Three trained research assistants together with the principal investigator interviewed 400 HIV patients on ARV drugs and 40 health workers and information obtained was recorded in the questionnaires. The interview was conducted during the daytime from Monday to Friday.

Other information was collected from patients' record forms, results of laboratory investigation forms and treatment forms using a checklist.

4.0. Data Processing

4.1. Data entry

The principal investigator checked the quality of data daily and then questionnaires were coded. A data entry clerk was hired to enter the data into the computer using software Programme Epi Info version 6.0. Out of range entries were also checked after initial running of frequencies of variables. Data cleaning was done after running initial frequencies of variables.

4.2. Data analysis

The principal investigator analyzed quantitative data entered into the computer using a computer Epi Info version 6. The analysis employed descriptive statistics. The first level of analysis involved initial running of frequencies of variables, followed by examination of frequency distribution of respondents' characteristics The second level involved cross tabulations of variables to examine the relation between independent and dependent variables. Chi-square and p-values were computed for contingency tables

5.0. Ethical Clearance

Ethical clearance was obtained from Directorate of Research and Publication of Muhimbili University College of Health Sciences.

Permission to conduct the study in the three district hospitals was obtained from the District Executive Director (DED), Regional Medical Officer (RMO), District Medical Officer (DMO) and Medical Officer In-charge (MOI) of district hospitals. Permission to collect data from patient's files was also obtained from the MOI of district hospitals.

6.0. Informed Consent

Verbal informed consent was obtained from all participants. The purpose and usefulness of the study was explained to participants. Participants were assured of confidentiality that any information provided would be strictly confidential between researchers and respondents. Names of respondents were not used except

their registration numbers that were used to represent the information required. Decision of respondents to participate in the study was voluntary and they had liberty to withdraw from the study at any time. Respondents were free to answer or not to answer any question, and were free to ask any question to the person who conducted interview.

7.0. Study Limitations

Since this study was addressing a sensitive issue touching individuals' life, in some cases respondents were not willing to provide required information. Some of the information collected from patient's files was missing such as laboratory results. Recall bias among patients was another source of study limitation. In order to overcome these limitations the purpose and benefits of the study was clearly explained to the respondents and they were assured that the information provided would be strictly confidential.

CHAPTER FOUR

4.0. RESULTS

The study sample involved 400 HIV outpatients receiving ARV drugs and 40 health care workers working in HIV clinics in the three district hospitals, i.e. Temeke, Amana and Mwananyamala.

Both HIV patients and health care workers were interviewed. Other information was obtained from patient's files using a checklist of questions.

Information on socio demographic characteristics of the HIV patients receiving ARV drugs is summarized in table 1 overleaf.

Table 1: Distribution of the study sample by socio - demographic characteristics of HIV patients on ARV drugs

Characteristics	No	%
Sex		
Women	288	72.0
Men	112	28.0
Total	**400**	**100**
Age		
I - 20	2	0.5
21- 40	260	65.0
41- 60	130	32.5
> 60	8	2.0
Total	**400**	**100**
Residence		
Kinondoni	166	41.5
Temeke	124	31.0
Ilala	91	22.8
Others	19	4.8
Total	**400**	**100**
Marital status		
Single	94	23.5
Married	107	26.8
Separated	40	10.0
Cohabiting	31	7.8
Divorced	45	11.3
Widow/Widower	83	20.8
Total	**400**	**100**

Table 1 continued

Education level	No	%
No formal education	24	6.1
Primary school education	231	57.8
Secondary school education	112	28.0
College education	28	7.0
University education	5	1.3
Total	**400**	**100**
Occupation		
No employment	19	4.8
Self employment	163	40.8
Public/government employee	47	11.8
Private sector employee	41	10.3
House wife	118	29.5
Others	12	3.0
Total	**400**	**100**
Religion		
Christian	194	48.5
Muslim	172	43.0
Lutheran	27	6.8
Others	7	1.8
Total	**400**	**100**
Hospital		
Mwananyamala	151	37.7
Temeke	148	37.0
Amana	101	25.3
Total	**400**	**100**

Out of 400 HIV patients on ARV drugs interviewed, 37.7 % of respondents were from Mwananyamala hospital, 37% were from Temeke hospital and 25 % were from Amana hospital.

Majority of respondents 72% (288) were women and 28% (112) were men. Respondents' age ranged from 17 – 70 years, 65% (260) were aged 21-40 years,

followed by 32.5% (130) who were aged 41-60 years. Only 0.5% (2) were of age 17 and 19 years respectively.

About 42% (166) of respondents were from Kinondoni district, 31 % (124) respondents were from Temeke district and 22.8% (19) were from Ilala district. The rest 4.8% (19) were from out side Dar es Salaam region.

Out of 400 respondents, 26.8% (107) were married, 23.5 % (94) were single, 20.8 % (83) were widowed /widower, 11.3% (45) were divorced, 10 % (40) were separated and the rest 37.8% (31) were cohabiting.

Majority of respondents 57.8% (231) had primary school education, followed by 28.0% (112) who had secondary school education. About 6.% (24) did not have formal education and only 1.3% (5) had university education.

Majority of the study sample were self-employed 40.8% (163), followed by housewives, 29.5% (118). Twelve percents (47) were public employees, 10.3% (41) were private sector employees, 4.8% (19) had no employments and 3% (12) had other employments.

Most of respondents were Christians, 48.5 % (194) followed by Muslims, 43.0% (172). About 6.8% (27) were Lutherans and 1.8% (7) of respondends were other religions (Pentecostal and seventh day prayers).

Information on types of ARV drugs used by HIV patients obtained from patients' record forms using a checklist is summarized in table 2

Table 2: Types of ARV drugs used by HIV patients.

Types of ARV drugs	No	%
CMB/EFV	47	11.8
CMB/NVP	45	11.3
D4T/3TC/EFV	13	3.3
TRIOMUNE - 30	205	51.3
TRIOMUNE - 40	62	15.5
TRIOMUNE 30/D4T/3TC	28	7.0
Total	**400**	**100**

According to table 2 above, 51.3% (205) of respondents were on TRIOMUNE – 30, followed by 15.5% (62) who were on TRIOMUNE - 40. Seven percents (28) were on ART initiation (TRIOMUNE 30/D4T/3TC). About 12% were on CMB/EFV and CMB/NVP respectively. A few of respondents 3.3% were on D4T/3TC/EFV.

Table 3: Distribution of types of ARV drugs used by HIV patients by sex

Types of ARV drugs	Sex		
	Women	**Men**	**Total**
CMB/EFV	11.5 %(33)	12.5%(14)	11.8%(47)
CMB/NVP	10.1%(29)	14.3%(16)	11.3%(45)
D4T/3TC/EFV	2.7.8%(7)	5.4 %(6)	3.3%(13)
TRIOMUNE- 30	5.2%(15)	48.2%(54)	51.3%(205)
TRIOMUNE 30/D4T/3TC	8.3%(24)	3.6%(4)	7%(28)
TRIOMUNE - 40	15.3%(44)	16.1%(18)	15.5%(62)
Total	72%(288)	28%(112)	400

Chi square = 11 Degree of freedom = 7 P value = 0.14

Table 3 above shows that, more men 48.2% (54) were on TRIOMUNE - 30 than women 5.2% (15).

Table 4: Side effects experienced by HIV patients on ARV drugs

Side effects experienced	No	%
Nausea/vomiting	65	16.3
Headache/fatigue	43	10.8
Skin rashes/itching	44	11.0
Liver problems	5	1.3
Peripheral neuropathy	42	10.8
Dizziness	28	7.6
Anemia	14	3.5
Others	18	4.5
Total	**400**	**400**

Table 4 above shows side effects experienced by HIV patients on ARV drugs in 2 -54 weeks

Out of 400 respondents, 16.3% (65) experienced gastrointestinal side effects such as abdominal discomfort, nausea, vomiting and diarrhoea. About 10.8% (43) experienced headache and fatigue. About 11% (44) experienced hypersensitivity reactions such as, skin rashes, itching and skin exfoliation. Few of respondents 1.3% (5) experienced liver problems such as, jaundice and elevation of liver enzymes. About 11% (42) of respondents experienced peripheral neuropathy.

Twenty-nine respondents 7.6% experienced central nervous system problems such as dizziness, insomnia and nightmares.

Fourteen respondents 3.5% experienced anemia and 4.5% experienced other side effects such as high fever, lipodistrophy, swelling of face and limbs, pigmentation of nails, ear problems and chest tightening.

Table 5: Side effects reported by HIV patients (from records)

n = 400

Side effects reported	No	%
Nausea/vomiting	78	19.5
Headache/fatigue	51	12.8
Skin rashes/itching	46	11.5
Hepatotoxicity	7	1.8
Anemia	18	4.5
Diarrhea	8	2.0
Numbness	46	11.5
Dizziness	25	6.3
Others	7	2.7
Total	**400**	**400**

Table 5 above summarizes information on side effects reported by HIV patients. Information was obtained from patients' records.

Majority of respondents 19.5% (78) reported to have experienced gastrointestinal problems (nausea, vomiting, abdominal discomfort and diarrhea), followed by 12.8% (51) respondents who reported to have experienced headache and fatigue. Forty-six 11.5% reported to have experienced hypersensitivity reactions such as itching and skin rashes. About 11.5% (46) reported having experienced peripheral neuropathy. The rest reported having experienced liver problems, anaemia, dizziness and other side effects

Table 6: Distribution side effects experienced by sex

Side effects experienced	**Sex**		
	Women	**Men**	**Total**
Yes	35.4% (102)	36.6% (41)	35.8% (143)
No	64.6% (186)	63.4% (71)	64.4% (257)
Total	**288**	**112**	**400**

Chi square = 0.45 Degree of freedom = P Value = 0.79678

Table 6 above shows that, out of 400 respondents 35.8% (143) experienced side effects. More men 36.6% (41) experienced side effects than women 35.8% (102), but the difference was not statistically significant ($p > 0.05$)

Table 7: Distribution of side effects experienced by age

Age	Side effects experienced n = 400		
	Yes	**No**	**Total**
1 - 20	0.0%	100% (2)	0.5% (2)
21 - 40	38.1%(99)	61.9% (161)	65% (260)
41 - 60	32.3%(42)	67.7% (88)	32.5% (130)
> 60	25%(2)	75% (6)	2% (8)
Total	**35.8%(143)**	**64.25%(257)**	**100%(400)**

Chi square = 2.8 Degree of freedom = 3 P value = 0.424

Table 7 above shows that the majority of those who experienced side effects 38.1%(99) were in the 21-41 years age group, followed by 32.3% (42) who were in the 41-60 years age group. Only two respondents were above 60 years.

Table 8: Distributions of side effects experienced by types of ARV drugs.

	Side effects experienced		
Types of ARV drugs	**Yes**	**No**	**Total**
CMB/EFV	38.3% (18)	61.7 %(29)	11.8% (47)
CMB/NVP	42.2% (19)	57.8% (26)	11.3% (45)
D4T/3TC/EFV	53.9% (7)	46.2% (6)	3.3% (13)
TRIOMUNE - 30	30.7% (63)	69.3% (142)	51.3% (205)
TRIOMUNE 30/D4T/3TC	46.4% (13)	53.6% (15)	7% (28)
TRIOMUNE - 40	37.1% (23)	62.9% (39)	15.5% (62)
Total	**35.8% (143)**	**64.3% (257)**	**400**

Chi square = 9.7 Degree of freedom = 7 P value = 0.21

Type of ARV drugs D4T/3TC/EFV was found to be associated with more side effects 53.9% (7) than other types of ARV drugs, followed by TRIOMUNE - 30/D4T/3TC 46.4% (13). However the association was not statistically significant ($p > 0.05$)

Table 9: Patients' awareness on ARV drugs

Knowledge on ARV drugs	Yes n= 400	No n = 400
ARV/ GIT	82.0%(328)	18.0%(72)
ARV/CNS	78.8%(315)	21.3%(85)
ARV/ALCOHOL	5.5%(22)	94.5%(378)
ARV/FOOD	27.3%(109)	72.8%(291)
ARV/HERBS	77.5%(310)	22.5%(90)
ARV/ANEMIA	67.0%(268)	33.0%(132)
ARV/STOP USING	97.5%(390)	2.5%(10)

Majority of respondents 82.0% (328) were aware that ARV drugs could cause gastrointestinal problems such as abdominal discomfort, diarrhea, nausea and vomiting. Seventy-two respondents 18% were not aware.

About 78.8% (315) of respondent were aware that ARV drugs could cause central nervous system problems such as dizziness, depression, insomnia, and nightmares. About 21.3% (85) were not aware.

Majority of respondents 94.5% (378) were aware that if ARV drugs are taken together with alcohol could cause problems. Twenty-two respondents (5.5%) were not aware.

About 72.8% (291) of respondents were aware that ARV drug has to be taken with adequate and nutritious food. The rest 27.3% (109) were not aware.

Majority of respondents 310 (77.5%) were aware that if ARV drugs are taken with herbal remedies and other drugs might cause problems such as malabsoption. Only 22.5% (90) were not aware.

About 67% (268) of respondents, were aware that some of ARV drugs could cause anemia. Thirty-three percents (132) were not aware.

Majority of respondents 97.3% (389) were aware that it is not advisable to discontinue treatment without any reason. Only few of respondents 2.5% (10) were not aware.

Respondents were interviewed about whether they were counselled before and after initiation of ART.

Majority of respondents 96.8% (387) received counselling before and after initiation of ART by counsellors. About 22% (88) of respondents had received counselling by doctors and nurses. Majority of respondents 91% had received information on ARV drugs.

Table 10: Monitoring of HIV patients on ART

Collection of medication	**No**	**%**
	334	83.6
Once / month	66	I6.4
Three / month	0	0
Total	**400**	**100**
Patients clinic attendance		
Once / month	284	71.2
Twice / month	113	28.3
Three / month	3	0.8
Total	**400**	**I00**
Repeated CD4 testing		
After 1 month	8	2.0
After 3 month	95	23.8
After 6 month	17	4.3
Not yet	247	61.8
Others	33	8.3
Total	**400**	**100**

Collection of medications

Table 10 above shows that majority of respondents 83.6% (334) collect their medication once per month and 16.4% (66) collect their medication twice per month.

Clinic attendance

Out of 400 respondents, 71.2% (284) attend clinic once per month and (28.3% 113) attend clinic twice per week

CD4 cell count testing

Majority of study sample 61.8% (247) had not repeated testing CD4 cell counts after initiation of ART. Only 23.8% (95) had repeated testing their CD4 cell counts after three months. Few respondents had repeated testing CD4 cell count in 6 month.

Table 11: Investigations performed before and after initiation of ARV drugs (from records)

Test	Before n = 400	After n = 400
Kidney function	43.5% (266)	9.8% (39)
Liver function	99.8% (399)	91.3% (365)
CD4 Count	100% (400)	32.0% (128)
Hemoglobin	95.5% (382)	88.5% (354)
Chest x-ray	98.0% (392)	5.3% (21)
Others	62.55% (250)	2.5% (10)

The information on investigations performed was obtained from patient record forms. Results of investigations performed before and after initiation of ART drugs are summarized in table 12 above. All respondents had tested their CD4 cell counts before initiation of ART. Only 32% (128) had repeated CD4 cell count testing. Majority of respondents had tested liver function 99.8% (399) before and after initiation of ART, More than 90% of respondents ha tested hemoglobin before and after initiation of ART. Only 9.8% had repeated kidney function test.

Information on management of side effects reported by HIV patients was obtained from patients' record forms using checklist.

Majority of respondents 16.3% (65) experienced mild and moderate GIT side effects such as nausea and vomiting whereby treatment was not indicated. Management was mainly by nutritional counseling. Few of respondents experienced mild and moderate diarrhoea, ORS and anti diarrhea drugs were prescribed. Those patients who had experienced severe diarrhoea, nausea and vomiting, IV fluids and multvitamins were prescribed.

Forty- three (10.8%) respondents reported to experience mild and moderate headache and fatigue where counselling and treatment was indicated. Analgesics (paracetamol and diclofenac tabs) were prescribed for symptomatic treatment Multivitamins tabs were prescribed for fatigue and body weakness.

Forty-four (11%) reported to experience hypersensitivity reactions presented by itching, skin rashes and skin exfoliation. Most of respondents experienced mild and moderate skin rashes and itching whereby antiallegy drugs such as piriton tabs, cetrizine tabs, calamine lotion, hydrocortisone cream, gentalene c- cream and antiseptic soaps were prescribed. Few of respondents had experienced severe skin rashes and itching, discontinuation of treatment and change of ARV drugs were indicated.

About 1.3%(5) of respondents experienced liver problems presenting either as jaundice or elevation of liver enzymes. In case of severe hepatic toxicity discontinuation and change of ARV drug regimen were indicated.

Forteen (3.5%) respondents experienced anemia. Those who experience mild and moderate anemia, haematinics drugs such as (Fefol caps, haemovit caps /syrup, HB tone, ferrous sulphate and folic acid tabs were prescribed. Few of respondents experienced severe anemia whereby discontinuation of ARV drugs was indicated followed by blood transfusion and change of ARV drug regimen.

Forty-two (10.8%) of respondents experienced mild and moderate peripheral neuropathy. Vitamin B complex tabs, neurobion tabs and amitryptylline tabs were prescribed. Few respondents who experienced severe neuropathy discontinuation of ARV drugs was indicated followed by change of ARV drugs.

Twenty-eighty (7.6 %) respondents experienced CNS problems such as dizziness, no treatment was indicated, and respondents were just advised to rest.

Few respondents 4.5% experienced other side effects such as high fever, lipodistrophy, nightmares, swelling of face and limbs, loss of appetite, pigmentation of nails, ear problems, insomnia, and chest tightening. Treatment and discontinuation of ART was indicated in cases of sever side effects.

Table 12: Distributions of HIV patients who changed ARV drugs by sex

Patient / changed ARV drugs	Sex		
	Women	**Men**	**Total**
Yes	10.4% (30)	8.9% (10)	10% (40)
No	89.6% (258)	91.1% (102)	90% (360)
Total	100% (288)	100% (112)	100% (400)

Chi square = 0.2 P value = 0.66

According to table 12 above out of 400 respondents, 10% (40) of HIV patients had changed ARV drugs regimen. More women 10.4% (30) had changed ARV drug regimen than men 8.9% (10).

Table 13: Distribution of types of ARV drugs by HIV patients who changed ARV drugs

Types of ARV drugs	HIV patients / changed ARV drugs		
	Yes	No	Total
CMB/EFV	12.8% (6)	87.2% (41)	11.8% (47)
CMB/NVP	6.7% (3)	93.3% (42)	11.3% (45)
D4T/3TC/EFV	23.1% (3)	76.9% (10)	3.3% (13)
TRIOMUNE - 30	9.8% (20)	90.24% (185)	51.5% (205)
TRIOMUNE 30/D4T/3TC	3.6% (1)	7% (27)	7% (28)
TRIOMUNE - 40	11.3% (7)	88.7% (55)	15.5% (62)
Total	**10% (40)**	**90% (360)**	**100% (400)**

Chi square = 5.74 Degree of freedom = 7 P value = 0.57

Majority of respondents 23.1% who had changed ARV drugs were on D4T/3TC/EFV, followed by 12.8% who were on CMB/EFV and 11.3%(7) were on TRIOMUNE - 40. However, statistically the association was not significant ($p > 0.05$)

Information on reasons for changing ARV drugs was obtained from patients' record forms.

Results revealed that main reasons for changing ARV drugs were, severe side effects, treatment failure, treatment success, and ARV drugs used by patients not available.

Majority of respondents had changed drug regimens because of side effects presenting as severe anemia, peripheral neuropathy, nausea and vomiting, nightmares, liver problems and chest tightening. Those who changed drugs because of treatment failure presented with decline of CD cell counts, weight loss, increase of viral load and drug résistance. Those who had changed drugs because of treatment success presented with increase of CD4 cell counts, weight gain, and decline of viral load.

Table14: Distribution of ARV drugs changed by alternative drugs prescribed

ARV drugs changed	No	Alternative ARV drugs prescribed
TRIOMUNE -30	1	ANT TB/CMB/EFV
TRIOMUNE -30	4	CMB/EFV
TRIOMUNE --40	1	CMB/EFV
CMB/NVP	3	D4T/3TC/EFV
TRIOMUNE -30	1	D4T/3TC/EFV
TRIOMUNE- 40	1	CMB/NVP
CMB/EFV	6	TRIOMUNE -30
NEVIRAPINE	1	EFV
TRIOMUNE- 40	7	TRIOMUNE -30
TRIOMUNE -30	3	TRIOMUNE -40
D4T/3TC/EFV	3	TRIOMUNE -3O
Total	**31**	

According to table 14 patients who were on TRIOMUNE - 30 had changed ARV regimen to CMB/EFV, D4T/3TC/EFV and TRIOMUNE - 40. Those who were on TRIOMUNE- 40 had changed ARV regimen to CMB/EFV. Those who were on CMB/NVP had changed ARV regimen to D4T/3TC/EFV. Those who were on CMB/EFV had changed ARV regimen to TRIOMUNE -30. Those who were on D4T/ 3TC/ EFV had changed ARV regimen to TRIOMUNE -30.

Table 15: Distribution of the study sample by socio demographic characteristics of health care workers.

Hospital	**No**	**%**
Mwananyamala	15	37.5
Temeke	15	37.5
Amana	10	25
Total	**40**	**100**
Sex		
Women	31	77.5
Men	9	22.5
Total	**40**	**100**
Age		
25 - 35	15	37.5
36 - 45	17	42.5
> 45	8	20.0
Total	**40**	**100**
Professions		
Doctor	8	20.0
Nurse	9	22.5
Pharmacist	4	10.0
Lab technician	3	7. 5
Counsellors	11	27.5
Others	5	12.5
Total	**40**	**100**

Out of 40 health care workers interviewed, majority were from Mwananyamala hospital 37.5% (15) and Temeke hospital, 37.5% (15) while few of respondents

25 % (10) were from Amana hospital. Majority of respondents were women 77.5% (31), the rest were men 22.5% (9).

Majority of health care workers were councillors 27%(11), followed by nurses 22.5%(9).

Table 16: Distributions of age of health care workers by sex

Age	Sex		
	Women	**Men**	**Total**
25 - 35	76.5%(13)	23.5%(4)	42%(17)
36 - 45	84.2%(16)	15.8%(3)	47%(19)
> 45	50%(2)	50%(2)	10%(4)
Total	**77.5%(31)**	**22.5%(9)**	**40**

Chi square = 2.24 Degree of freedom = 2 P value =0.33

Majority of health care workers 84% (16) were women who were in the 36 – 45 years age group, followed by 76.5% (13) women who were in the 25 – 35 years age group.

Table17: Distributions of health care workers' cadre by sex

Professions	Sex		
	Women	**Men**	**Total**
Doctor	37.5% (3)	62.5%(50	8 (20%)
Nurse	88.9%(8)	11.1%(1)	9 (22.5)
Pharmacist	50.0%(2)	50%(2)	4 (10%)
Lab technician	66.7%(2)	33.3%(1)	3 (7.5%)
Counsellors	100%(11)	0%	11 (27.5%)
Others	16.1%(5)	0%	5 (12.5%)
Total	**31 (77.5)**	**9 (22.5%)**	**40 (100)**

Chi square = 1 4.59 Degree of freedom = 5 P value = 0.0123

Majority of health care workers were counsellors 27% (11) and all of them were women, followed by nurses 22.5% (9). Among doctors there were more men 62.5% (5) than women 37.5% (3). Majority of nurses were women 88.9% (8). About 16% (5) were other professions (phlebotomists, nutritional counselors, nurse assistants and pharmaceutical assistants).

Table 18: Training on management of HIV patients and ARV drugs

Training on management	**No**	**%**
Yes	38	95
No	2	5
Total	**40**	**100**
Training on ARV		
Yes	34	87.2
No	5	12.8
Total	**39**	**100**

Out of 40 health care workers interviewed, 95% (38) had received training on ARV drugs and on management of HIV patients. Only 2 respondents (5%) had not received any training.

Majority of respondents had received training for short duration (2 - 21 days). Only 2 respondents had received training for 30 days.

Table 19: Monitoring of HIV patients on ARV drugs

Monitoring procedures	**No**	**%**
Yes	39	100
No	0	0
Total	**39**	**100**
Procedures functioning		
Yes	38	100
No	0	
Total	**38**	**100**

Table 19 shows the summary of procedures put in place to monitor HIV patients on ARV drugs. Out of 40 health care workers interviewed, 39 respondents reported that procedures for monitoring patients were in place and satisfactory.

Patients on ARV initiation were scheduled to attend clinic every two weeks, those who were on follow up were schedules to attend clinic once per month and those with problems were advised to visit clinics at any time. Other procedures were, home-based care system to follow patients who did not attend scheduled clinics. Counselling on nutrition, ARV drug use and side effects. Laboratory investigations such as Haemoglobin, liver, Kidney and CD4 cell count

Most of respondents were aware of the side effects associated with ARV drugs reported by HIV on ARV drugs. Commonly reported side effects were, peripheral neuropathy, gastro intestinal side effects (such as loss of appetite, abdominal discomfort, diarrohea, nausea and vomiting), hypersensitivity reactions (such as skin itching, rashes and skin exfoliation), headache and fatigue, anaemia (low hemoglobin below 7gm/dl), liver problems (such as jaundice and elevation of liver enzymes.), CNS problems (such as dizziness, insomnia, depression and nightmares).

Most of respondents reported the following were main reasons for changing ARV drugs. Treatment failure presented, Treatment success, severe side. Other reasons were pregnancy; TB and ARV drugs used by patients were not available.

Majority of respondents reported the following advises they provide to patients in case of severe side effects. Patients were advised to attend clinics as scheduled for clinical examination, laboratory investigations, nutritional and ARV drugs counselling. For severe side effects ARV drugs should be stopped and ARV drugs suspected to cause side effects changed.

CHAPTER FIVE

5.0. DISCUSSION

Socio demographic characteristics of HIV patients on ARV drugs

Majority of respondents 65% were in the age group 21 – 40 years, followed by 32.5% who were in the age group 41 – 60 years. Only two respondents were 17 and 19 years respectively This finding is consistent with results of NACP, 2003 report whereby the age group 20 – 49 was the most affected by HIV infection for both sexes, and there were high risk of HIV infection among youth and higher vulnerability to infection among women in the year 2003.

Most of respondents 41.5% reside in Kinondoni district, 31% reside in Temeke district, and 22.8% respondents reside in Ilala district and the rest 4.8% were from outside Dar es Salaam region. According to Population Census, 2002, Kinondoni has a big population of about I, 088,867, followed by Temeke district, which has a population of 771,500, and Ilala has a population of 637,573. Therefore, these results could have been due to the reason that Kinondoni has a mixture of people with different cultures, behaviours, life style and beliefs that may contribute to high HIV infection.

Majority of study sample 26.8% were married, followed by those who were single 23.5%. About 20% of respondents were either widow or widower. Equal proportion 11% were found among respondents who were separated and divorced. The rest of respondents 7.8% were cohabiting.

Majority of respondents 59% had primary school education followed by secondary school education 20.3%. About 9.8% of respondents had college education and 0.7% had university education.

About 40.8% were self-employed mainly businesspersons, they tend to interact with different people; therefore they are at high risk of HIV infection. Housewives constituted 29.5%. About 11% were either public or private employees and the rest 3% had other types of employment such as peasants and fishermen. However few of respondents 4.8% had no employment. This finding is consistent with NACP, 2003 report that HIV epidemic has spread throughout the country affecting all sectors of the society. According to NACP, 2005 sickness and death due to AIDS reported to have reduced agricultural labour force, productivity and disposable income in many families and rural communities. This indicates that patients had lost employments because of HIV infection because of loss of ability to work. Those who were self-employed they had used most of their capitals for medical services because of sickness. Some of them had lost ability to work hence reduced productivity and source of income generation.

Results of this study revealed that, there were five types of ARV drug regimen, which were used by HIV patients, i.e. TRIOMUNE - 30/40, CMB/EFV, CMB/NVP, D4T/3TC/EFV and TRIOMUNE - 30/D4T/3TC. All types of ARV drugs used were first line drug regimens. Each type of ARV regimen consisted of a combination of three drugs from two classes of ARV drugs, NRTIs and

NNRTIs. Therefore, treatment of HIV patients is based on NACP, 2005; WHO, 2003 recommendations that, a triple therapy consisting of two NRTIs is combined with one medication from either of the two classes NNRTIs and PIs. However, none of the types of ARV drug used by HIV patients had combination therapy of drugs from PIs. In addition, types of ARV drug regimen used by patients did not consist of didanosine, abacavir and ternofovir from NRTIs. Therefore, results show that second line drugs are not yet available.

Majority of respondents were on fixed dose combination TRIOMUNE - 30 /40, depending on the body weight. Those who had body weight below 60 kg 51.3% (205) were on TROUMNE - 30. (D4T30/3TC/NVP). Those who had body weight above 60kg 15.5% (62) were on TRIOMUNE - 40 (D4T40/3TC/NVP). This finding suggest that selection of type of ARV drugs for patients to start with is based on NACP, 2005 recommendation that, unless contraindicated, all patients will commence therapy on D4T-30/ 40/3TC/NVP.

About 11.3 % were on CMB/NVP (AZT/3TC/NVP); this suggests that respondents had symptoms of peripheral neuropathy. NACP, 2005 recommends that patients can start on AZT/3TC/NVP if there is peripheral neuropathy.

About 11% were on CMB/EFV (AZT/3TC/EFV); this suggests that patients had TB and no anemia. NACP, 2005 recommend that patients can start therapy on AZT/3TC/EFV if there is TB and no anemia.

Those who were on D4T/3TC/EFV had TB and anemia. NACP, 2005 patients can start on D4T/3TC/EFV if there is TB and anemia.

Those who were on TRIOMUNE –30/40/D4T/3TC were on ARV initiation.

Results of this study revealed that out of 400 respondents, 35.8% (143) experienced side effects. This finding shows higher rates compared to results reported by Habtegiorgis A, 2003 whereby side effects were noted in ten (30.3%). Men 36% experienced more side effects than women 35.4% but the difference was not statistically significant. Those who experienced side effects 38.1% were in the 21- 40 years age group, followed by 32% who were in the 41 –60 years. Type of ARV drugs (D4T/3TC/EFV) was associated with more side effects 53.9% than other types of ARV drugs, followed by TRIOMUNE/D4T/3TC 46.4%.

Majority of respondents 16.3%(65) had experienced mild abdominal discomfort, diarrhea, nausea and vomiting in early ARV treatment. This finding is similar to results reported by Montessori et el, 2004 and NACP, 2005 that common but mild side effects occurring early in most ARV drug regimens include, gastrointestinal side effects such as bloating, nausea, vomiting and diarrhoea which may be transient or may persist throughout therapy, which often require patient assurerance that symptoms are common and will decrease over time. ARV interruption is seldom indicated. Few patients experienced severe GIT side effects such as diarrhea whereby treatment was indicated.

About 12% of respondents experienced mild hypersensitivity reaction such as skin rashes itching and skin exfoliation. This finding is similar to results reported by Lesho, 2003 that NNRTIs are associated with skin rashes. However this result shows higher proportion compared to results reported by Hartmann et al, 2005 that in patients treated with NVP or EFV, 4.5% (n=30) developed skin rashes. Nevirapine; 2.4% and EFV 6.4% however, it was concluded that therapy with Nevirapine or EFV does not have to be interrupted if rashes exhibit no blistering, mucosal manifestations or systemic side effects. Other patients experienced severe skin rashes and skin exfoliation whereby treatment and discontinuation of ART were indicated. According to Montessori et al, 2004 it has been reported that most rashes are common adverse effects of the NNRTIs, particularly NVP. This result shows lower proportion compared to Montessori et al, 2004 whereby approximately 16% of patients taking this agent experience a mild to moderate maculopapular rash, with or without pruritus, on the trunk, face and extremities within the first 6 weeks on therapy. Although most rashes are self-limited, NVP should be discontinued if rash is severe or accompanied by constitutional symptoms. Severe rashes occur in about 6.5% of NVP treated patients, mainly in the first 4 weeks of treatment including Stevens-Johnson Syndrome and toxic epidermal necrosis in less than 1% of all patients treated with NVP.

About 11% of respondents experienced mild and moderate headache and fatigue. This could have been due to AZT similar to what has been reported by Montessori et al, 2004.

About 11% of respondents experienced mild, moderate and severe peripheral neuropathy, therefore treatment and discontinuation **of** ART were indicated. The results are similar to findings reported by Montessori et al, 2004 that D4T is associated with peripheral neuropathy.

About 8% experienced CNS problems such as dizziness, insomnia and nightmares. According to Montessori, 2004, it has been reported that, nightmares are associated with EFV. This finding shows lower rates compared to results reported by Lochet, 2003 that the late NPAR (abnormal dreams) was 24%.

About 4% of respondents experienced mild, moderate and severe anemia, whereby treatment was indicated. This finding is similar to results reported by Lesho, 2003; NACP, 2005) that NRTIs, AZT is associated with anemia.

About (1%) respondents experienced liver problems such as jaundice and elevation of transaminase enzymes. In cases of severe side effects ARV drugs were stopped and changed. This finding is consistent with results reported by. Nunenz, 2005: Dietrich, 2003 that although several ARV drugs have been reported to cause fatal acute hepatitis, most often cause an asymptomatic elevation of transminase levels. Liver toxicity is more frequent among subjects with chronic HCV and HBV co-infection and alcohol users. Fatal cases of acute hepatitis are related to hypersensitivity reactions in cases of NNRTIs to mitochondria toxicity in cases of nucleoside analogues. Alcohol intake and use of other co- factors that

increase the incidence of transaminse level elevation among HIV- infected patients.

About 5% of respondents experienced other side effects such as high fever, lipodistrophy, swelling of face and limbs, pigmentation of nails, ear problems and chest tightening. This finding is similar to results reported by Carry, 2000 that side effects associated with ARV drugs include mitochondria toxicities, hypersensitivity and lipodistrophy.

More than 70% of respondents were aware that ARV drugs could cause side effects such GIT, CNS side effects and anemia. However, few respondents were not aware that alcohol might cause problems if taken together with ARV drugs. According to Nunez et al, 2005 alcohol intake and use of other drugs are other co-factors that increase the incidence of transaminase level elevation among HIV-infected patients.

Findings of this study on monitoring of patients on ARV drugs revealed that majority of respondents 83.6% were collecting their medication and attending clinic once per month. This suggests that these respondents were on ARV follow up. About 16.4% were collecting their medication and attending clinic twice per month. This suggests that these respondents were on ARV initiation. All patients had tested their CD4 cell counts before initiation of ART. However about 32% of patients had repeated testing CD4 cell counts after initiation of ART. Majority of

respondents had tested their haematological and biochemical tests before and after initiation of ART. These findings are similar to NACP, 2005 recommendations and results of Montessori et al 2004 that, CD4 cell count is a gold standard method used to determine the time for initiating therapy. Each patient should have a baseline CD4 /viral load if possible before initiation treatment. CD4 cell count should be repeated at least every 6 months

Management of side effects is very important as if patients are not treated can worsen the disease and if side effects are fatal they can cause death, hence increase morbidity and mortality. Majority of respondents 16.3% who reported to have experienced mild and moderate nausea and vomiting treatment was not indicated. Management was mainly by nutritional counseling. For severe nausea and vomiting intravenous fluids and multivitamins were prescribed. Management of GIT side effects was based on NACP, 2005 recommendations and Montessori et al, 2004 report that common but mild which may be transient or may persist throughout therapy side effects occurring early in most ARV drugs often require patient assurerance that symptoms will decrease over time. For severe nausea and vomiting intravenous fluids and multivitamins were prescribed. Eighty respondents (2%) experienced severe diarrhea, ORS and anti diarrhea drugs were prescribed. For severe diarrhea IV, fluids and Vitamin B complex injection were prescribed

Forty-six (11.5%) reported to have experienced hypersensitivity reactions presented by itching, skin rashes and skin exfoliation. Most of respondents

experienced mild and moderate skin rashes and itching whereby antiallegy drugs such as piriton, cetrizine, calamine lotion hydrcortisone cream, gentalene c cream and antiseptic soaps were prescribed. Few of respondents experienced severe skin rashes and itching discontinuation of treatment and change of ARV drugs was indicated.

Fifty one (10.8%) reported having experienced mild and moderate headache and fatigue, counselling and treatment were indicated. Treatment of headache was mainly by analgesics (paracetamol and diclofenac) and multivitamins were prescribed for fatigue and body weakness.

Forty six (10.8%) of respondents reported having experienced mild and moderate peripheral neuropathy. Vitamin B complex, neurobion and amitryptylline were prescribed for treatment. Few of them who experienced severe peripheral neuropathy, discontinuation of ARV drugs was indicated followed by change of ARV drugs.

Twenty-five (7.6%) respondents reported having experienced CNS problems such as dizziness, nightmares and insomnia no respondents were advised to rest, and treatment was indicated. However few respondents who experienced severe nightmares ARV drug interruption was indicated

Eighteen (3.5%) respondents reported having experienced anemia. Those who experienced mild and moderate anemia haematinics drugs were prescribed such as

Fefol , haemovit, HB tone, ferrous sulphate and folic acid. Few of respondents experienced severe anemia, discontinuation of ARV drugs was indicated, followed by blood transfusion and change of ARV drug regimen. This finding is consistent with NACP, 2005 that severe side effects in which ARV drug must be stopped and replaced by alternative drug include anaemia (hemoglobin < 7.5gm/dl or falling hemoglobin as can occur with the use of AZT.

Seven respondents (1.3%) reported having experienced hepatic toxicity presented either as jaundice or elevation of liver enzymes, discontinuation and change of ARV drug regimen was indicated in cases of severe side effects. Management of liver problems is similar to results reported by Nunenz et al, 2005 that management of liver toxicity is based on its clinical, severity and pathogenic mechanism. Although low grade HAART related hepatotoxicity most often spontaneously resolves, severe grades may require discontinuation of ARV drugs, for example when there is liver decompesation, hypersensitivity reaction or lactic acidosis.

Few respondents 4.5% reported having experienced other side effects such as high fever, lipodistrophy, swelling of face and limbs, pigmentation of nails, ear problems, and chest tightening. In cases of severe side effects discontinuation of treatment was indicated

Results revealed that 10% of respondents had changed ARV drug regimen. More women 10.4% had changed ARV drugs than men 8.9%. This finding is almost

similar to results reported by Roca et al, 2000 that patients who received stavudine, lamivudine plus nelfinavir, discontinuation of treatment took place because of refusal to take medication in 11 participants 17% and because of side effects in 7 participants 11%.

Majority of respondents 23.1% who had changed ARV drug regimen were on D4T/3TC/EFV, followed by 12.8% who were on CMB/EFV. These results suggest that they had changed ARV drugs most probably because of side effects associated with D4T, 3TC, EFVand AZT.

About 11% who changed ARV drugs were on TRIOMUNE – 40, this suggests that they had changed ARV drugs because of treatment failure. This result shows lower proportion compared to results reported by Montessori et al 2004 that, up to 25% of HIV patients on ARV discontinue their treatments because of treatment failure.

Results revealed that main reasons for changing ARV drugs were, severe side effects, treatment failure, treatment success and ARV drugs used by patients previously not available and in cases of TB. Change of ARV drug regimen was based on NACP, 2005 recommendations that, ART should be stopped when there is evidence of toxicity or intolerance to one or all drugs, treatment failure as evidenced by the patient becoming symptomatic and progressive decline of CD4 cell count and rise of viral load or both despite good adherence to antiretroviral treatment.

Majority of respondents had changed ARV drug regimens, because of severe side effects presented by severe anemia, peripheral neuropathy, nausea and vomiting, nightmares, liver problems and chest tightening. Those who changed drugs because of treatment failure presented with decline of CD4 cell counts, weight loss, increase of viral load and drug resistance. Those who had changed drugs because of treatment success, presented with increase of CD4 cell counts, weight gain, and decline of viral load.

Findings of this study revealed that majority of the health workers 77% were women. Most of them were counsellors and the dominant age group was 36 – 45. Majority of health workers had received training for 2 – 21 days; only 2 health workers had received training for 30 days.

Results revealed that procedures to monitor patients were in place; this finding is similar to NACP, 2005 recommendations. Majority of heath workers were aware of side effects of ARV drugs reported by patients and their managements of whether mild moderate or severe side effects. This is an indication of success for training they had received. Majority of respondents reported main reason for changing ARV drug regimen was side effects. Majority of respondents were competent enough to give management options and advise in case of severe side effects.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1. CONCLUSION

From this study, it was found that treatment of patients using ARV drugs was based on standard treatment guideline. The following types of ARV drugs were found to use by patients. TRIOMUNE - 30/40, CMB/EFV, CMB/NVP, D4T/3TC/EFV and TRIOMUNE - 30/D4T/3TC. All types of ARV drug regimens were first line ARV drug regimen, triple therapy consisting two drugs from NRTIs and one drug from NNRTIs. However, second line ARV drug regimens are not yet available in our country.

Findings of this study revealed that ARV drugs used by patients were generally found to be associated with different side effects. A significant proportion of HIV patient who were on ARV drugs experienced side effects.

The following were commonly reported side effects experienced by HIV patients. Gastrointestinal problems such abdominal discomfort, diarrhea, nausea and vomiting, hypersensitivity reactions such as itching, skin reactions and skin exfoliation. Other side effects were headaches and fatigue, peripheral neuropathy, CNS problems such as dizziness, insomnia, depression and nightmares. Few patients experienced anaemia and small proportion of respondents experienced liver problems such as jaundice and elevation of transamise levels.

Other patients experienced other side effects such as high fever, lipodistrophy, swelling of face and limbs, pigmentation of nails, ear problems and chest tightening.

Majority of patients were aware on the use of ARV drugs and side effects associated with ARV drugs except few of them.

Procedures for monitoring HIV patients were based on NACP guideline. Criteria for initiation of ART were based on CD4 cell count and symptomatic HIV disease. However, a significant proportion of patients had repeated testing CD4 cell counts in 6 months. Haematological tests and biochemical investigations were done for majority of patients before and after initiation of ART.

Management of side effects was based on whether side effects were mild, moderate or severe. Management of mild side effects was mainly by nutritional counselling. For moderate side effects counselling and treatment were indicated. In cases severe side effects ART interruption was indicated followed by change ARV drugs.

A small proportion of HIV patient who experienced side effects had changed their ARV drug regimen. Main reason of stopping and changing ARV therapy was side effects. Other reasons were treatment failure, treatment success, and TB cases.

Most of health care workers were aware of ARV drugs recommended for treatment and management of HIV patients in general, except few of them. However, majority of them had received training for short duration 2 –21 days on ARV drugs and management of HIV Patients.

6.2. RECOMMENDATIONS

According to finding s of this study, the following are recommended:

- The MOH need to put deliberately efforts to ensure that second line drugs are available for alternative drug regimens in cases of severe side effects or treatment failure.
- The MOH need to improve monitoring procedures in general for early detection and diagnosis of side effects.
- The MOH should conduct regular seminars to raise health care workers' awareness on management of HIV patients.

Further research.

Findings of this study points the following possible areas for further study. More research should be carried out in the following areas.

- To determine long term, severe and complicated side effects of ARV drugs.
- To investigate on treatment failure due to drug resistance and adherence as reasons for changing ARV therapy.

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