

ADHERENCE COUNSELLING IMPROVES ADHERENCE TO ANTIRETROVIRALS

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Assignment submitted in partial fulfilment of the requirement for the degree of Master of
Philosophy (HIV/AIDS Management) at Stellenbosch University.



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MARCH 2010

AKNOWLEDGEMENT

I would like to thank God in the name of Jesus Christ for holding my hand, till the completion of this study. This is dedicated to all the beloved who made it possible for the success of the study and to my late beloved friends, colleagues, relatives and clients.

To my parents, my aunts and uncles and all my family worldwide. My study leader Dr Thozamile Qubuda, the Management at Pretoria West Hospital and University of Stellenbosch. Thank You. May God bless all of you.

DECLARATION

By submitting this assignment electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

February 2010

ABSTRACT

The study investigate if adherence counselling improves adherence to antiretrovirals. The aim of the study is to improve adherence to antiretrovirals and reduce morbidity and mortality rate due to HIV/AIDS. The study used One Group Post Test -only design. The participants in the study were measured on adherence to antiretrovirals after they have received three sessions of adherence counselling.

The objectives of the study was to :

To explore the adherence behaviour of patient on antiretrovirals

To determine the adherence rate of patient on antiretrovirals

To determine the impact of adherence on adherence counselling

To explore relationship between different demographic variables and adherence

To explore relationship between different adherence measures

The study brings to the front the HIV/AIDS picture. The crippling of the parts of the society by HIV/AIDS. The prevalence of HIV and the impacts HIV has on, nations, individuals ,household and industries are brought into perspective.

The study goes back to the origin of HIV/AIDS and further tackles issues related to HIV/AIDS and adherence, which are the anatomy, physiology, basic knowledge and description of HIV/AIDS. The study tackles antiretrovirals, their classes, regimen side effect and important consideration while on antiretrovirals. The effectiveness of the antiretroviral therapy in reducing morbidity and mortality is discussed as well as the efforts by different countries globally in the roll out of antiretrovirals to fight the pandemic.

The study explores the challenges to adherence to antiretrovirals and possible intervention. In this study adherence, adherence to antiretrovirals, predictors of adherence, barriers to adherence, adherence strategies and measures of adherence are explored. Assessment and intervention during adherence counselling are discussed. The study results supported our hypothesis, that adherence counselling improves adherence to antiretrovirals.

OPSOMMING

Die studie ondersoek of getrouheidsberading wel getrouheid tot antiretrovirale behandeling bevorder. Die doel van die studie is om te getrouheid tot antiretrovirale behandeling te bevorder en sieklikeid en mortaliteit koers wat aan MIV/Vigs verwant is te verminder. Die studie gebruik een groep na-toets -alleen ontwerp. Die deelnemers in die studie was gemeet op getrouheid tot antiretrovirale behandeling na hulle drie sessies berading ontvang het.

Die doelwitte van die studie was:

Om getrouheid van die pasiënt op antiretrovirale behandeling te bepaal

Om die koers van getrouheid van die pasiënt op antiretrovirale behandeling te bepaal

Om die impak van gebrouheid op getrouheidsberading te bepaal

Om die verhouding tussend verskillende demografiese veranderlikes en getrouheid te bepaal

Om die verhouding tussend verskillende getrouheidsmetings te bepaal

Die studie bring die MIV/Vigs situasie na vore. Die voorkoms van MIV en die impak wat dit op nasies, individue, huishoudings en nywerhede het, is in perspektief gestel.

Die studie gaan terug tot die oorsprong van MIV/Vigs en kyk na MIV/Vigs verwante kwessies soos anatomie, fisiologie, basiese kennis en beskrywing van MIV/Vigs. Die studie kyk na antiretrovirale behandeling, hul klasse en newe-effekte. Die effektiwiteit van die antiretrovirale behandeling word bespreek asook die pogings deur verskillend lande wêreldwyd in die uit rol van antiretrovirale behandeling om die pandemi te beveg.

Die studie ondersoek die uitdagings van getrouheid tot antiretrovirale behandeling en moontlike ingryping. Getrouheid tot antiretrovirale behandeling, voorspellers, hindernisse, strategieë en metings van getrouheid word in die studie bespreek. Die resultate van die studie ondersteun ons hipotese dat getrouheidsberading wel getrouheid tot antiretrovirale behandeling verbeter.

DEFINITION OF TERMS AND ACRONYMS

ADCC-Antibody Dependant Cellular Cytotoxicity

AIDS-Acquired Immune Deficiency Syndrome

ARV's-Antiretrovirals

BSL 3-Biosafety Level 3

CARES-China AIDS Response

CBO-Community Based Organization

CCMT-Comprehensive Plan for HIV and AIDS Care,Management and Treatment

CDC- Centre for Disease Control

DNA-Deoxy Ribonucleic Acid

DOH-Department of Health

DREAM-Drug Resource Enhancement against AIDS and Malnutrition.

EIA-Enzyme Immuno Assay

FBO-Faith Based Organization

FDA-Food and Drug Adminisrtation

HAART-Highly Active Antiretroviral Therapy

HEART-Help Enhance Adherence to Antiretroviral Therapy

HIV-Human Immune Deficiency Virus

IFA-Immunofluorescence Assay

MC- Male Circumcission

NGO-Non –Governmental Organization

PCR-Polymerase Chain Reaction

PCP-Pneumocystis Carinii Pneumonia

PEP-Post Exposure Prophylaxis

PLWA-People Living With HIV/AIDS

PMTCT-Prevention of Mother to Child Transmission of HIV/AIDS.

RNA-Ribonucleic Acid

SAAVI-South African AIDS Vaccine Initiatives

SAHIVSOC-South African HIV Society of Clinicians

STI-Sexually Transmitted Infection

UNAIDS-Joined United Nation Programme on AIDS

VCT-Voluntary Counselling and Testing

WHO-World Health Organization

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CHAPTER 1

1.1 INTRODUCTION TO THE STUDY

HIV/AIDS pandemic is a challenge Worldwide to individuals, families, industries and nations. Worldwide 2.0 millions lost their lives due to HIV/AIDS in 2007 and 33 million are living with HIV/AIDS. Mortality and morbidity due HIV/AIDS, left the world in distress. The people are grieving for their loved ones and at the same time, dealing with the burden of HIV/AIDS.

Countries worldwide are making urge effort to combact the pandemic. The effort is focused on prevention, treatment, care and support, human rights, monitoring and evaluation and more research to impact the epemic (UNAIDS, 2008).

We believe countries effort in education in order to reduce discrimination are succesfull, as globally individuals tends to accept those who are living with HIV/AIDS. However there are still people who discriminate against those who are living with HIV/AIDS. It is very discouraging to know that in this day in time there are still people who are involved with such acts. HIV affects also of us, if it does not infect us. People living with HIV/AIDS are humans ,they need support, motivation and love like any other person.

In 2003 November the South African Cabinet approved the national operational plan for the comprehensive HIV/AIDS, Care, Management and Treatment (CCMT). Therefore CCMT were accredited to issue antiretrovirals (DOH, 2007).

Antiretrovirals are the drugs used to supress the viral replication in order to prolong the lives of those who are living with HIV/AIDS. Antiretrovirals are life long treatment they have side effects and toxicity. They are to be taken as they are prescribed. This is called adherence, which also includes changes in with life styles that are contrary with adherence to medication. In order for the treatment to be effective, thus suppresing viral replication, adherence rate has to be $\geq 95\%$. However there are other classes of antiretrovirals which achieve viral suppression with adherence of lower than 95%.

Studies in the United state report average adherence among patient on antiretrovirals to be 70%. Non – adherence to antiretroviral put the patient at risk of developing drug resistance. Drug resistance is likely to be followed by morbidity and mortality (Machtinger, 2008).

1.2 STATEMENT OF THE PROBLEM

Adherence requires medication to be taken as prescribed, the keeping of appointment, the changing of lifestyles and behaviour which are not appropriate to adherence. Adherence to antiretrovirals prolong life of those who are on antiretrovirals. It requires an adherence of \geq 95% for the full suppression of the virus (Machtinger, 2008).

Non adherence to antiretrovirals may result with the development of drug resistance. The resistance strain can be transmitted to the next person. The drug resistance to antiretrovirals reduces the treatment options of those who are affected.

Adherence to antiretrovirals is a challenge to people living with HIV/AIDS. There are many patients reported to be defaulting to antiretrovirals in the public sectors. A study in Johannesburg reported that one in every six patient who were on antiretrovirals defaulted treatment over a 15 months period (UNAIDS, 2008).

1.3 THE SIGNIFICANCE OF THE STUDY

According to Brink (1999) the study is significant if its findings will be beneficial, increase the knowledge and help in the improvement of policies. The study will increase knowledge of health care professionals on adherence to antiretrovirals and issues related to adherence. It will further assist in developing and improving policies on adherence and adherence counselling.

1.4 RESEARCH QUESTION

What is the effect of adherence counselling on adherence to antiretrovirals?

1.5 RESEARCH OBJECTIVES

To explore the adherence behaviour of patients on antiretrovirals

To determine the adherence rate of people on antiretrovirals

To determine the impact of adherence on adherence counselling

To explore relationship between different demographic variables and adherence

To explore relationship between different adherence measures

1.6 OPERATIONAL DEFINITION

Adherence Counselling- This is the discussion with the clients on information regarding, the basic knowledge of HIV/AIDS, antiretrovirals drug literacy, adherence strategies, dietary information, coping strategies and the importance of following doctor's prescription. Antiretrovirals- these are the drugs that inhibit the viral replication. They antagonize the virus. They control the HIV, by suppressing viral load and improve the immune system.

1.7 FORMULATION OF THE HYPOTHESIS

According to Burns (2001) hypothesis is the statement of the expected relationship or relationships between variables. Hypothesis predicts the outcome of the study. In our study the hypothesis is Adherence counseling increases, adherence to antiretrovirals.

CHAPTER 2

2. RESEARCH METHODS

2.1 RESEARCH DESIGNS

One group post Test –Only Design is used. The single group of participants will be measured on the dependant after treatment condition. In our case the one group of participants from the Pretoria West Hospital Comprehensive, Care, Management and Treatment of HIV will be measured on the dependant variable which is adherence counselling (Christensen, 2002).

2.2 SAMPLING DESIGN

Random sampling technique was used in selecting the subject, to participate in the study. Systematic Interval Sampling will be used. This means the selecting of the at equal intervals, for an example every 3rd, 5th, 6th element. The number of the population was divided by the sample size to get the sampling interval. In cases the sampling interval is two, every 2nd person within the total population for that day participated in the study (Brink, 1999).

Data was collected at Pretoria West Hospital, in Gauteng Province South Africa. The Hospital is situated at the Western part of Pretoria in area called Phillip Nel. Its Catchment Area is Danville, Lotus Garden, Daspoort, Karen Park, Proclamation Hill and Laudium. It provides maternity, family planning, Laboratory Services, curative and HIV/AIDS services. The HIV/AIDS services include Prevention of Mother to Child Transmission of HIV/AIDS (PMTCT), TB/HIV collaboration, Voluntary Counselling and Testing and Comprehensive, Care, Treatment, Management of HIV/AIDS (CCMT).

The participants in the study will be both males and females with ages ranging from 15 years and upwards, who received three sessions of adherence counselling prior initiation with antiretroviral and have been on treatment for ≥ 6 months.

2.3 DATA COLLECTION INSTRUMENT

The data was collected using Morisky Scale, Visual Analogue Scale, Pill Count, Last three days methods, and the evaluation of CD4 count and viral load results to assess adherence to antiretroviral.

2.4 ETHICS

Anonymity, Confidentiality and Privacy was ensured .Access to information about the participants was controlled and was not revealed to anyone outside the research group. Informed consent was revealed from the participants before commencing with the study. Pretoria West Hospital gave the permission for conducting the study (Christensen, 2002).

2.5 PILOT STUDY

Pilot study is a small scale study which is collected before the actual study, a small number of participants from the same population which of the study in used in pilot study. The problems are identified early and dealt with. The pilot study also assess the feasibility of the study (Brink, 1999). The pilot study was conducted at Pretoria West Hospital with eight patient, who received three sessions of adherence counselling prior to initiation with Antiretrovirals. Problems were identified and dealt with, hence the data collection with the actual study was smooth and easy.

2.6 DATA ANALYSIS

Data was analysed using SAS, which is Statistical Analytic Software .

CHAPTER 3

3. LITERATURE REVIEW

3.1 THE PREVALENCE OF HIV/AIDS

Globally, there is an estimation of 33 million living with HIV. The annual number of new infections has decreased from 3.0 million in 2001 to 2.7 million in 2007. The annual number of HIV infection is declining in countries as Asia, Latin America and Sub-Saharan Africa. In 2007 2.0 million people worldwide died of HIV, compared with 1.7 million in 2001 (UNAIDS, 2008).

Sub-Saharan Africa in 2007 had a new infection rate 1.9 million in 2007. Sub-Saharan Africa is the home of 67% of people living with HIV/AIDS. In the same year adult prevalence has exceeded 15% in seven Sub-Saharan African countries and above 5% in other seven countries. However the pandemic in Sub-Saharan Africa seems to have stabilized. Data collected from South African countries as Zimbabwe indicate that the HIV prevalence among pregnant women attending antiretroviral clinic fell from 26% in 2002 to 18% in 2006 and a decline of 25% in 2001 to 18% in 2006 was noticed in Botswana. It must be noticed that data from pregnant women gives an indication of epidemiological trends (UNAIDS, 2008). South Africa in 2007 had 35% HIV infection and 38% of HIV death. Nearly six million South Africans are living with HIV/AIDS (The star, 2008).

370,000 children under the age of 15 became infected with HIV in the year 2007. The number of the children living with HIV under the age of 15 increased from 1.6 million in 2001 to 2.0 million in 2007. 90% of these who are infected with HIV live in Sub-Saharan Africa. 270,000 of children infected with HIV died in 2007. HIV is the reason for the death of over one third of the children under the age of five. Globally the percentage of people living with HIV remains at 67% (UNAIDS, 2008).

3.2 THE IMPACT OF HIV/AIDS

HIV/AIDS impacts are the effects the pandemic is having on the society. According to Barnett and Whiteside (2002) impacts lead societies to take paths that it would have not taken; without the impacts of microbes originating in Europe which wiped 95% of the

population, America would have a different population composition ,culture,economy,and political system.

HIV/AIDS impacts demography, economy, individuals,household and the other sectors of the government as the education, social and health. In measuring impacts countries conducts census and survey, to measure key demographic indicators. This and household indicators are used to calculate other indicators as total fertility rate, growth, dependancy, age, structure, life expectancy, infant, child and martenal mortality rate (Whiteside, 2002).

The Impacts of HIV/AIDS on the Demography

Demoraphy deals with the population dynamics. It looks at the number,growth and the structure of the population and the indicators which are birth, death, fertility, life expectancy, infant and child mortality rate (Barnett et al., 2002).

The Impact of HIV/AIDS on Mortality Rate

HIV/AIDS increases mortality rate worldwide. A meta –analysis study discovered that mortality in Africa has risen in the 1990’s. It was found out that death rate among adults aged 15-44 in Abidjan, Cote d’Ivoire was due to HIV, same applied to death in Tanzania among adult aged 15-59. A study done in Uganda reported that death was more prevalent among HIV positive individuals, than their peers who were HIV negative.

The Impacts of HIV/AIDS on Life Expectancy

According to Barnett et al., (2002). life expectancy is the describtion of the level of mortality measured in years, with specification of the population and time.

According to the United Nations Development Programme, human development reports and bereau of the census, it was estimated that life expectancy in South Africa was 63.2 in 1993 as compared to 35.5 in 2010 and the life expectancy in Kenya was estimated to be 55.5 in 1993 as compared to 44.3 in 2010 (Whiteside 2002). According to DOH (2004) mortality rate in 1990 suggested that the 15 year old had a 29% chance of dying before the age of 60, but the mortality rate in 2006 suggest that a 15 year old had a 56% chance of dying before the age 60.

The Impacts of HIV/AIDS on Infants and Child Mortality Rate

According to the South African National Strategic Plan, the under 5 mortality has increased from 65 death per 1000 births in 1990 to 75 death per 1000 in 2006. Mother To Child Transmission of HIV increases infant mortality rate. Rakai Cohort study found that mortality was 225 per 1000 for children born to HIV positive mothers and 97.7 for children born to HIV negative mothers. Many infants will leave beyond their first birthday, but few will survive beyond their fifth (Whiteside, 2002).

The impacts of HIV/AIDS on infant and child mortality is contrary to the international development goals set by the Developmental Assistance Committee of the OECD to reduce infant and child mortality by two thirds by 2015, thus Sub-Saharan Africa need to move from 1990 rate of 101 per thousand to 33 in 2015 (Whiteside, 2002).

The Impacts of HIV/AIDS on Fertility

Number of births will absolutely be affected if women die before reaching the end of their childbearing age. In Africa one third of lifetime births occur to women over the age of 30 years. HIV reduces fertility. In Masaka it was found out that fertility rates were 20-30% less among HIV infected women (Whiteside, 2002).

The Impacts of HIV/AIDS on Population Size and Growing

It is envisaged that HIV will reduce the number of population, thus the population will be smaller than it would have been without AIDS. Various studies estimated that by the year 2003, Botswana, Zimbabwe and South Africa will experience a negative population growth a down to -0.1 to -0.3 from 1.1 to 2.3 in the absence of AIDS (Whiteside, 2002).

The Impacts of HIV/AIDS on Dependency Ratio and Orphans

This is the number of dependants, which is the children under the age of 15 and adults above the age of 64 per 100 adults aged 15-64 by years of productive age. The dependency ratio is adversely affected by HIV/AIDS, because AIDS increases mortality among young adults and children (Whiteside, 2002).

The Impacts of HIV/AIDS on Economy

HIV reduces income and increases expenditure. In cases where most workers especially skilled workers, are sick, absent from work or are dead. The economy becomes affected. The output of firms and impact measures as Gross domestic Products are affected (Whiteside, 2002). HIV can slowly reduce economic rate and is likely to reduce economic growth from 0.5% to 1.5% over 10-20 years in high prevalence areas (UNAIDS, 2008).

HIV/AIDS results in high morbidity and mortality rate. The work force is also affected. The situation reduces production. The sick workers will often absent themselves from the work due to poor health. The production of the company is affected severely, especially if the absent employee is the skilled worker who is responsible for the most of the corporation's product. The company can also be affected by the death of the skilled workers, as the death may indicate they have to hire and train other workers. The result is the loss of profit.

It is envisaged that the economic growth is much slower with AIDS than it is without AIDS and that over a 5 years period the economy could be up to 25 % than it would have been without AIDS. The low life expectancy reduces growth by 1.3%. In 1999 RSSC sugar (Swaziland) estimates death attributable to HIV/AIDS as 9.41/1000. In one of the companies in South Africa in the year 1999 the impacts of HIV/AIDS on salaries was 1.1 % of the operating profit, 3.4% of pretax profits and 4.6 of after tax profits. Again HIV could reduce the number of potential customers. Many markets which are depending on population size could be more vulnerable (Whiteside, 2002).

The Impacts of HIV/AIDS on Health

The quality of health service is affected. Hospitals as a result of HIV/AIDS admit many patient. At times they are unable to manage the number of the client they have admitted. Once the patient are stable, they are discharged, in order to accommodate critically ill patients. Health professionals are overworked, due to the large numbers of patient. In that case they provide poor quality of service, due to exhaustion. They absent themselves from work in order to rest. These results with the shortage of staff to provide the quality of care.

According to UNAIDS (2008) the pandemic results in more expenses to the government. In Zambia due the delivery capacity was reduced by 6.2%, labour cost increased by nearly 10%.

It is estimated that by 2010 the Botswana government will have to spend 7-18% of the budget. More will be on health, poverty alleviation and employment (Whiteside, 2002).

The Impacts HIV/AIDS on the Individual and Household.

Poverty, lack of education, reduced income and broken families may occur as a result of poverty. Due to the death of the parents, children may end up heading the family or we may have a broken family as children may stay with different relatives. The sick breadwinner may lose his/her job, or his/her salary spent on medical expenses. The family then leaves in poverty due to reduced income or no income at all. Parents with no income may fail to pay the educational expenses of their children or children may not concentrate at school due to bad circumstances at home.

According to UNAIDS (2008) the pandemic has impacts on households. In India the pandemic consumes 82% of the poorest annual income and 20% income of the wealthiest. In Botswana, the share of the household has increased to below the poverty line by 6%. HIV/AIDS will slow the annual rate of poverty reduction by 60% in Cambodia, 38% in Thailand and 23% in India between 2003 and 2010 or 12.

There are other impacts on HIV, on the educational and social sector. For example, with high numbers of teachers being infected with HIV/AIDS, children's education will be affected as teachers will be sick and absenting themselves from work or dying due to HIV/AIDS. The increased number of orphans will affect the social welfare.

3.3 WHAT IS HIV/AIDS

HIV is the abbreviation of Human Immunodeficiency Syndrome. HIV causes AIDS. AIDS stands for the Acquired Immune Deficiency Syndrome. The virus has different stages of which AIDS is the last stage. During this stage the client is infected with the opportunistic infection. The immune system cells which are the CD 4 count are not sufficient to protect the body against these opportunistic infections.

3.4 THE PROGRESSION OF HIV TO AIDS

The progression from HIV to AIDS differs with individuals. However, there are other factors such as the availability of treatment, pregnancy, stress, poor nutrition and poverty, which affect the progression from HIV to AIDS.

In cases where there is no intervention with treatment progression to HIV/AIDS tends to be faster than it would have been with treatment. According to Gert (2008) without intervention the individual dies after 7-10 years of infection.

Evian (2003) report that there are rapid progressors, slow progressors and non-progressors to HIV/AIDS. It may take 5-7 years for a rapid progress to develop AIDS. Some rapid progressors develop AIDS 3-4 after infection with HIV/AIDS. The slow progressors may be well for a long time with no disease and immune deficiency or little of those. They may remain well for 10-15 years or more. The non-progressor, which usually constitute 5% of those HIV infected people, may never progress to AIDS or any immune deficiency.

3.5 THE MODE OF THE SPREAD OF HIV

The Sexual Transmission of HIV/AIDS

HIV can be transmitted through sexual intercourse, (unsafe sex), with the infected person. Anal sex and oral sex also transmit HIV/AIDS. The other factors that increases the sexual transmission of HIV, are sexual transmitted diseases, promiscuity and having sexual intercourse during menstruation.

The Blood Transmission of HIV/AIDS.

The blood transmission of HIV/AIDS can happen during exposure to the infected blood. For example during blood transfusion with the infected blood, during delivery of the baby where the infected mother's blood can be in contact with the baby, during accidents, in occupational setting as the health setting, where the health care worker can sustain sharp instrument injury from an infected patient and during injection drug use.

Mother to Child Transmission of HIV/AIDS

According to Hubley(2002) HIV can be transmitted from mother to Child during pregnancy, at birth, and during breastfeeding. The risk of mother to child transmission of HIV in children who are not breastfed is 15-25%, and in children who are breastfed is 25-45%. It is envisaged that HIV is likely to be transmitted during labour when there is prolonged time between the rupture of the membrane and the delivery of the baby.

According to Policy Project (2001) heterosexual transmission of HIV/AIDS account for 88% of HIV transmission, Mother to Child transmission account for 10%, while blood transfusion account for 2% of HIV infection.

Other fluids as the saliva have a lower concentration of HIV. There is a less risk of the transmission of HIV, if an HIV positive person is kissed. Any lesions in the mouth may increase the likely hood of HIV transmission (Hubley, 2002). There are report of people who are not contracting HIV, even after they are exposed to the risk of contracting HIV/AIDS as, unsafe sex. According to Avert (2006), HIV uses its two proteins gp120 and gp 41 to attach to the CD 4 and beta chemokines receptors (CCR5 /CXCR4). People who lacks this beta chemokine receptor as a results of genetic mutation or due to blockage by chemical messengers (natural chemokines) may not be infected by HIV or may progress to AIDS slowly if they are infected.

3.6 FACTORS FACILITATING THE TRANSMISSION OF HIV/AIDS.

Lack of HIV/AIDS Education –Lack of HIV education is responsible for the increase in the number of HIV/AIDS infection. The lack of information on the basic knowledge of HIV/AIDS as the mode of transmission, risky behaviour and the prevention can results with individuals engaging with risky behaviours without even knowing it. Education is appropriate at the family level, school level and the community level.

According to UNAIDS (2008), the HIV/AIDS basic knowledge is still below the global goal of ensuring comprehensive HIV knowledge in 95% of young people by 2010 (as far as declaration commitment on HIV/AIDS, 2001, Survey data from 64 countries states that comprehensive knowledge of HIV/AIDS is 40% in males and 38% in females. The number of people having sex before the age of 15 is around 12% in males and around 11% in females.

Perception of Risk- It was found out that even though many people have knowledge on HIV, the pandemic continue to spread. In a study conducted in Malawi, the participants who knows about HIV/AIDS reported their perceived risk of contracting HIV/AIDS as small or non existing (Policy Project, 2001).

Multiple Sexual Partners – Multiple sexual partners fuel the spread of HIV/AIDS. According to Zambia Sexual Behaviour Survey as cited in Policy Project (2001) 39% of sexually active men and 17% of sexually active women had a non regular partner within the past 12 months

Sexually Transmitted Diseases -According to Policy Project (2001) the prevalence of sexually transmitted disease is fuelling the spread of HIV/AIDS. Sexually Transmitted Infections remain untreated, especially in areas of weak health System.

Commercial Sex Work-commercial sex work also increases the spread of HIV/AIDS. Again sex workers may find themselves in situations where they are forced to use unsafe sex and at the same time they engage in sexual activities with many Partners. Low level of Circumcision- Uncircumcised men are at risk of contracting HIV than the circumcised men. According to the study done in Zambia only 7% of men were circumcised (Policy Project, 2001).

Population of humanitarian concern-The population of humanitarian concern refers, to the displaced population/people. These are people affected by conflicts, disaster and other emergencies. The risk of HIV in this population is due to mobility, infrastructure destruction, sexual violence, rape, breakage of social norms and other factors associated with displacement (UNAIDS, 2008).

Incarceration-Incarceration is considered as a risk factor for HIV/AIDS infection. Rape, homosexuality, unsafe sex, intravenous drug use and risk of blood exposure due to violence are activities happening within the correctional facilities (DOH, 2007). Violence –Rape is among the drivers of the pandemic in South Africa. Rape cases in South Africa, continue to increase, rather than decline. According to the study by Interpol, International Police Agency, South Africa leads the world with rape cases and every 17 seconds a woman is raped. 30% of adolescents reported that their first sexual experience was forced. 16% of men believe women who were raped enjoyed the experience and asked for it. In 2003, 52 425 cases were reported in South Africa, while in 2006, 55 000 rape cases were reported and 450 000 estimated cases of rape were not reported (Rape Survivor Journey, 2009).

Migrant Labour System -Moving from one area to the other or one country to the other increases the spread of HIV. The individuals who are away from their families and partners for a long time as a result of migration, tend to have other sexual partners while they are staying. Policy Project (2001) report that some major projects may require men to live their

families for an extended period, which lead men to engage in sexual activities with people other than their partners.

According to the DOH (2007) HIV is prevalent among people aged 15-49 in urban informal settlement. Studies report the rate of HIV to be 25.8% in urban informal settlement as compared to 13.9% in urban formal settlement. Settlement Patterns- Urbanization and transition from traditional to modern culture give rise to new patterns of sexual behaviour (Policy Project, 2001). Injecting Drug use- Injecting drug use increases the exposure. There is an expansion of 5% to 50% in one year among injection drug users (UNAIDS, 2008). Lack of women empowerment- the disempowerment of women is responsible for the high transmission of HIV/AIDS. Lack of empowerment results with women being unemployed. Women tend to rely on men for survival. Women end up being involved with exchange sex, intergenerational sex, agree to unsafe sex to make money. The situation is even worse in marriages women find it difficult to negotiate safe sex due to lack of empowerment.

In Botswana and Swaziland the women who lack sufficient food are 70% less likely to perceive personal control in sexual relationships, 50% are likely to engage in intergenerational relationships, 80% are more likely to engage in survival sex and 70% are more likely to engage in unsafe sex than those who are receiving adequate nutrition (UNAIDS, 2008).

According to Whiteside (2002) Women account for 50% of people living with HIV/AIDS. Cultural Practices. Women are expected to obey their husband traditionally. Reasoning with a man in many cultures shows disrespect. Women find themselves in situations where they cannot insist on safe sex, even if they know about their partners' infidelity. According to Policy Project (2001) there is no relationship between polygamy and HIV transmission. Observers believe polygamy is contributing to the spread of HIV/AIDS. Polygamy can be risky in cases where one partner is unfaithful. These will lead to the spread of HIV to the whole cycle of polygamy. Traditional healers in their healing processes often use sharps and instruments on different people without sterilizing them which they continue to use on the next person without sterilizing them (DOH, 2007). Lack of Political Commitment- Politicians have a great influence on citizens. The more they debate about a particular issue, people may take it seriously. The spread of HIV can decline with political commitment (Gert, 2008).

3.7 THE PREVENTION OF HIV/AIDS

The transmission of HIV can be prevented through the abstinence from sex. The avoidance of multiple partners, thus being faithful to one partner and the practice of safe sex through the use of condoms. The Information, Education and Communication campaigns (IEC) are effective in the battle against HIV. Information can be provided through HIV/AIDS education in schools, health education in clinic and the campaigns in communities and the workplace. The distribution of the pamphlets on HIV, the use of the media, the community mobilization can help in the reduction of HIV campaigns. The education must include the basic knowledge of HIV/AIDS, behaviour change, perception of risk, stigma and discrimination and HIV prevention.

Partnership with the Community Based Organization (CBO), Faith Based Organization (FBO), Traditional healers and People Living with HIV/AIDS (PLWA) may play a large role in the prevention of HIV/AIDS transmission. The FBO and the CBO may assist in referring the patient for the health treatment. If knowledge is given to the traditional healers on HIV/AIDS, more especially on the risk of transmission of HIV/AIDS, the incidence of blood transmission will be reduced as they will always sterilize their equipments, to reduce the HIV transmission.

Community Mobilization involves the training of peer educators, Voluntary Counselling and Testing counsellors, Life skill educators within the communities to disseminate information on HIV/AIDS. According to Policy Project (2001), the screening of blood and donors for safety, is an effective strategy in reducing the transmission of HIV/AIDS. The rolling out of antiretrovirals in preventing and treating HIV/AIDS is another means of reducing the transmission of HIV. The management of opportunistic infections, as well as Tuberculosis and HIV collaboration.

More studies on vaccines and antiretrovirals will be of assistance in the battle against HIV/AIDS. Circumcision reduces the risk of HIV/AIDS infection. It is envisaged that men who are circumcised, has a lower risk of contracting HIV/AIDS than uncircumcised men. The roll out of male circumcision will decrease the spread of HIV in men and indirectly in women. It was found out that, in countries where circumcision is more practiced, the HIV prevalence was low than those countries which practice less circumcision. The state

public health institution should offer circumcision, with the equipment which are safe and meet infection control requirements (Bertran, 2007).

According to Policy Projects (2001), individuals who has undergone Voluntary Counselling and Testing (VCT) change their sexual behaviour. Studies proves that VCT is effective as a preventive strategy. Programmes and Policies to address HIV/AIDS transmission to be initiated and developed. The programmes and policies must focus on addressing violence, discrimination, human rights, women empowerment, migration issues, and poverty and protecting the vulnerable. UNAIDS (2008) report that countries need to put in place evidence –informed policies and programmes indealing with HIV/AIDS.

In empowering women, information, education and skills can be provided to women. UNAIDS (2008) reported that the implementation of scaled –up measures to increase women independency is required, in order to mitigates HIV impacts on women. 90% of women who participated in microfinanace initiatives, reported that their lives has changed to the best. The strengthening of the health system, the provision of the basic infrastructure and the provion of quality health services has an impact in the prevention of HIV/AIDS.

The prevention strategies above should reach all the population, including those at risk as the, injecting drug users, the youth, population of humaritarian concern, men who have sex with men, commercial sex workers, prisoners and e.t.c.

Combination of all the intervention is effective in reducing HIV/AIDS rather than the implementation of one intervention. The monitoring and the evaluation of the cos effectiveness of the preventive strategies is very important in the prevention of HIV/AIDS (Policy Project, 2001).

Countries Efforts in the Prevention of HIV/AIDS

Countries developed the strategic plans in managing and treating HIV/AIDS. 69% of countries report having a national strategy which is translated into operational plan with goals,targets and costing. Half of the countries strategedy meets UNAIDS quality assurance (UNAIDS, 2007). South African National AIDS Council in 2007, under the leadership of the Deputy President Phumzile Mlambo Ngcuka, mandated the Department of Health to develop

HIV/AIDS national strategic plan 2007-2011, referring to the 2000-2005 HIV/AIDS strategic Plan as a guiding framework. (DOH,2007)

Financing HIV /AIDS programmes in low and middle income countries, shows encouraging results as the reduction in mortality rate and the new infections. Through this intervention the global epidemic has declined from 3.0 million to 2.7 million. Generally more countries reported progress in 2008, than in the previous years (UNAIDS, 2008).

According to UNAIDS (2008) in 14 of the 17 countries, the percentage of women living with HIV/AIDS aged 15-24, has declined. In seven countries the decline has exceeded 25% target for 2010, set in the declaration commitment.

According to Policy Project (2001), the scale up of the prevention of Mother to Child transmission of HIV/AIDS is also one important factor in the reduction of HIV/AIDS. Mothers who are HIV positive should also be discouraged to breastfeed their newborn especially if there are other alternatives. The provision of the milk formula in replacing breast feeding is a good initiative in supporting HIV positive mothers.

3.8 THE HISTORY OF THE VIRUS

Sporadic case reports of AIDS and sero-archaeological studies date the existence of HIV to the 70's. In 1981 several cases of Kaposi Sarcoma was recognised among the patients, with the Centre for Disease Control (CDC) at the same time recognizing the increased number of patients with Pneumocystis Carinii Pneumonia (PCP) (Avert, 2009).

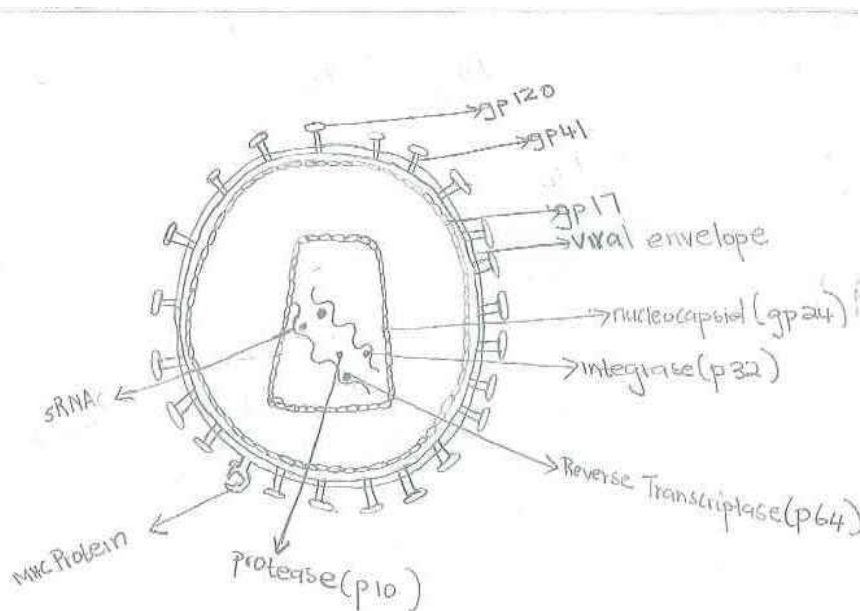
The condition remained with no identity, till it was called AIDS, in 1982. Reason for this name was because it is acquired rather than inherited, it was rendering the immune system ineffective and it was a syndrome not a disease. HIV was isolated in 1983 at the Louis Pasteur Institute in France. World Health Organization in the same year reported the known cases of HIV/AIDS in America to be 2 803 (Avert, 2009).

According to Avert (2009) in 1983 again the assurance was provided on the transmission of HIV/AIDS to allay anxieties in communities. It was indicated that HIV can be transmitted through sexual intercourse, blood and Mother to Child Transmission. The knowledge on HIV transmission improved through the years.

In 1986 a drug azidothymine (AZT), reported to slow down the attack of HIV/AIDS. AZT was produced in 1964, as a Cancer treatment which proved to be ineffective (Avert, 2009). According to (Avert, 2009), AIDS was first discovered in the United States of America, where some patient was presenting with opportunistic infections. Louis Pasteur isolated the human immune deficiency Virus in 1984. There are several theories on where HIV/AIDS comes from. The focus now is on the management and treatment of HIV/AIDS.

THE DESCRIPTION OF HIV

Figure 1. The Structure of the Human Immuno Deficiency Virus



The Human Immunodeficiency Virus (HIV) belongs to the classes of retroviridae or retroviruses and from the subgroup of lent viruses. Other Lent viruses as SIV, FIV, Visna, CAEV, cause diseases in monkeys, sheep, cats and goat. The virus can be seen with an electron microscope. For the virus to grow or reproduce, it has to infect other cells, as it cannot grow on its own (Avert, 2009).

The virus is 100-150 billionths of a meter in diameter. Its genetic information is stored in RNA as compared to all organisms and more viruses, which store their genetic information on long strands of DNA. The virus converts its RNA to DNA. It has nine genes, while bacteria have 500 and humans have 20,000 to 25,000. The nine genes are gag, pol, env, tat,

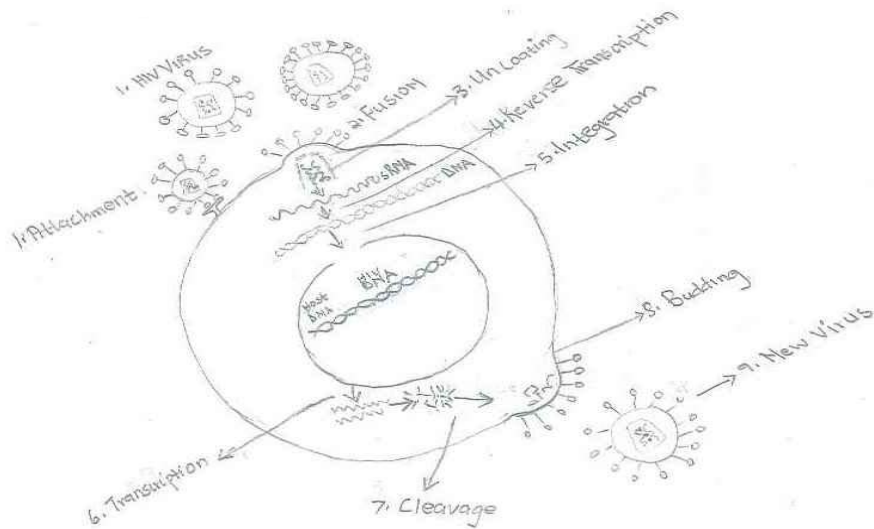
rev, nef, vif, vpr, vpu.”The first three genes carry information to make structural proteins of new virus and the last six code for protein that control the ability of HIV to infect a cell and produce new copies of the virus. The long terminal repeat at the end of each sequence of DNA helps to control HIV replication (Avert, 2009).

The virus has an envelope (a code of fatty material). Projecting from the surface of the viral envelope is the 72 spikes of glycoproteins. The outer membrane glycoprotein is the called gp 120, while the transmembrane glycoprotein is known as gp 41 (Mwangi, 2005).

The structural protein called matrix protein, made of gp17, lines the inside of the viral enveloped. The bullet shaped capsid made of p24 covers the genetic core of the virus. Enclosed within the capsid is the two single stranded RNA and the viral enzymes, protease, integrase and reverse transcriptase. Histocompatibility complex (MHC) class I and II are of most importance (Avert, 2009).

3.10 THE VIRAL LIFE CYCLE

Figure 2. The Viral Life Cycle



The HIV viral cycle consists of different steps, from the attachment of the virus on the host cell, to the budding of the virus through the infected cell to infect other cells. Pieribone (2006) explain the different steps of the viral life cycle as follows.

Attachment

The Human Immune Deficiency Virus attaches itself to the CD4 T-lymphocytes. The proteins on the surface of the virus attaches to the protein on the CD4 –T lymphocytes surface. The CD4 T –lymphocytes proteins, which serve as receptors are CD4 and beta-chemokines receptors (CCR5 and CXCR4), while the proteins on the surface of the Human Immune Virus are the gp 120 and gp 41. They are also known as the antireceptors .The gp 120 attaches to the CD4 count receptor and the chemokines CCR5 and the CXCR4, while gp41 facilitate the fusion (Pieribone, 2006).

Fusion / Penetration.

According to Pieribone (2006) the process of penetration and fusion follows after attachment. Penetration allows the nucleocapsid, which contains the genetic core of the virus to be able to be injected into the cytoplasm of the cell. After gp 120 attaches to the CD4, its three sugar coated proteins spread apart, allowing gp41, which is normally hidden by its protein to bind to the chemokine receptor. The process allows the viral envelope and the cell membrane to melts into each other.

Uncoating

Uncoating is an essential step for the virus genetic information Ribonucleic Acid (RNA), to be converted into the Deoxyribonucleic Acid(DNA). The nucleocapsid which encloses the RNA has to be dissolved, for the conversion of RNA to DNA to occur (Pieribone, 2006).

Reverse Transcription

Reverse transcription is the process, whereby the viral RNA is converted to DNA. This happens opposite to the usual transcription which happens in human cells, whereby DNA is transcribed into messenger RNA, which directs the cell's function.

HIV uses its enzyme reverse transcriptase to convert its single stranded RNA into double stranded DNA. The enzyme uses the building blocks of DNA to make the process possible. These building blocks are adenine, cytosine, guanine and thiamine (Pieribone, 2006).

Integration

Integration occurs after a successful transcription. Integration is a process whereby Viral DNA is inserted into the cell's DNA by the enzyme integrase.

The mechanism in which HIV DNA is transported through the nuclear membrane to the nucleus of the host cell is unclear, though the viral protein R (PVR) is suspected to facilitate the movement (Pieribone, 2006).

Viral Latency/Protein Synthesis

The process follows, a successful integration of viral DNA into the host's DNA. At this stage the virus is latently infected with HIV. The viral DNA is called a provirus. This provirus is now waiting for activation.

Once the immune cells become activated, the provirus awakens and instructs the cellular machinery to produce the necessary components. From the viral DNA two strands of RNA are constructed and transported out of the nucleus. One is translated into the subunits of HIV as protease, integrase, structural protein and reverse transcriptase, while the other strand becomes the genetic material of the new virus (Pieribone, 2006).

Cleavage and Viral Assembly

Following the production of the subunits. The subunits are separated in order to assemble in the new virus by the viral enzyme protease. The subunits again combine after cleavage to make content of the new virions. The structural subunits mesh with the cell membrane, allowing the nucleocapsid to take shape. Then the viral RNA, wound tightly to fit into the nucleocapsid (Pierebone, 2009).

Budding

This is the final step of the HIV viral cycle. The nucleocapsid merges with the cell membrane to make its viral envelope. The new virus buds through the cell membrane into the blood circulation, ready to infect other cells of the immune system (Pierebone, 2003).

3.11 THE IMMUNE SYSTEM

The immune system is the body system consisting of organs, cells, cellular product. It protects the body from microorganisms which are pathogenic as viruses, bacteria, fungus, parasites and malignancies as cancer. There are two types of immunity. Innate immunity and acquired immunity which is also termed adaptive immunity (Van Zyl, 2008).

Innate Immunity

This is the first line of defence. It is non-specific. After the pathogen enters the body, innate immunity is activated and responds with a local inflammation. Every time the pathogenic microorganism invades the body it manifests the same way, even in cases where the invader invades for the second time. It can at times eliminate the invader without additional immunity. The innate immunity includes the natural killer cell lymphocytes and the dendrite cells. The natural killer cell lymphocytes kill the target cell by antibody dependant cellular cytotoxicity (ADCC) (Mwangi, 2008).

The dendrite cell localises the antigen and present it to the responsive T lymphocytes and B lymphocytes. The other cells of innate immunity are the monocytes, neutrophils, eosinophils, basophils, macrophages, epithelial cells and tissue mast cells. The innate immunity activate the more complex acquired immunity (Mwangi, 2005)

Acquired Immunity

This is antigen specific, thus it responds particularly to a particular antigen and acts against its components. The acquired immunity displays the memory which assists our bodies from not acquiring the same infection again. It has two hallmarks, the humoral and the cell mediated immunity also called the cellular immunity (Van zyl, 2008).

Humoral Immunity

After activation, the humoral immunity produces complex protein molecules called the antibodies. Cells responsible for the production of antibodies are the B lymphocytes. The antibodies attaches to the organism rendering them ineffective, thus preventing them from causing infection or it binds to this cells ,so that they can be recognised, by cells for killing (Mwangi, 2005).

Cell mediated Immunity/Cellular Immunity.

These ride the body of the organism that invades the host cell. The cellular immunity consists CD4 + T Cells also termed helper cells T cells and CD8 + T Cells also termed cytotoxic T cells and other cells. They are also called T Lymphocytes. When activated CD4 + T lymphocytes produces the cytokines which activate other cells of the immune system hence it is called the orchestrators of the acquired immunity. The CD 8 lymphocytes kill the infected

cells directly. They recognise the infected cells with the components of the organism on the surface of the cell (Mwangi, 2005).

The Immune System and the Normal Infection

In illustrating the immune system and the normal infection, the rhino virus is used as an example. The rhino virus is responsible for the common cold. The virus enters the respiratory tract through inhalation, where it infects the epithelial tissue of the airways through the specific receptor. The immune system is activated by the entry of the virus into the host cell. Innate immunity respond with a local inflammation and attempt to control the infection, and at the same time triggers acquired immunity (Van Zyl, 2008).

Dendrite cells carry the virus from the site of the infection to the lymph nodes, where acquired immunity is activated. The activated B lymphocytes and T lymphocytes enters the blood stream and back to the site of the infection .Humoral and cellular Immunity occurs at the site of the infection. Antibodies attaches to the virus particles, while the cytolytic T cells (CTL) kills the infected cells, thus clearing the body from the infection (Van Zyl, 2008).

The Immune System and HIV infection

Most HIV/AIDS infection is through sexual intercourse, though HIV can be transmitted through infected blood and from the mother to the child during pregnancy. HIV enters mucosal tissues of the genital tract crosses the epithelial cells and infect the cells beneath the epithelium.

More T lymphocytes do not appear at the site of the infection, before they are activated by the innate immunity.HIV binds to the migrating dendritic cells, which transport the virus to the lymph nodes, where the virus is exposed to many T lymphocytes. Viral replication occurs with replication of the T lymphocytes. At the acute phase of the infection both the innate immunity and the acquired immunity are at work. However this phase is characterised by the large number of the viral particles. Though the CD 4+ T lymphocytes are being infected. The immune system is able to control the infection. The results being reduction in the number of the Viral load CD 4 + T lymphocytes (Van Zyl, 2008).

At the latent phase the viral remain stable. The CD 4+ T lymphocytes, at this stage also called CD 4 count remain constant though still reduced. What is happening at this stage is the actual

stimulation of the immune system by the virus antigen. The exhaustion of the immune system occurs as results of the continuous stimulation (Van Zyl, 2008).

Because of the exhaustion the immune system, when stimulated produces it inferior responder cells, which are ineffective, allowing the virus to multiply again .In the absence of the effective immune system, without intervention the body acquire opportunistic infections and AIDS (Van Zyl, 2008).

3.12 HIV VACCINATION

It is envisaged that the administration of the vaccine, which is 50% effective to, 30% of the population, will results with HIV infection decline by more than half over the next 15 years and 80% of reduction in HI V infection can be observed with more effective vaccine (Avert, 2006).

On the 29th July 2009, Phase I, trial was launched in South Africa Presently worldwide there is no vaccine which is registered, with FDA (Food and Drug Administration. In 2009 there 29 vaccine on trial. It is difficult to develop HIV vaccine as compared to the other vaccine. Reason being, no documented case of HIV recovery, where a person is healed of HIV/AIDS, so there is no natural mechanism for scientist to imitate, HIV attacked the orchestrator of the immune system, can remain latent ,occurs in several clades, and in addition to all it mutates rapidly (AIDS info, 2006).

Vaccine is a product which is injected in the body to help the body fights the pathogen which causes disease. The vaccine stimulates our immune system, control and prevents infections. There are two types of vaccines, which are preventative and therapeutic.

Therapeutic Vaccine

These types of vaccines are designed to control HIV infection in those people who are already infected with HIV, thus prolonging their life and reducing the transmission rate of HIV/AIDS from one person to another.

Preventative Vaccines

These are designed to prevent HIV/AIDS negative people from contracting the virus.

How Does the Vaccine Work?

Every time microorganisms invade our body, the immune system is activated. The particular microorganism is attacked, after the immune system defeated the microorganism or after a successful immune response. The immune system remembers on how it beat the perpetrators, in cases of re-infection. That is displaying the memory (AIDS info, 2006).

The vaccine which is the resemblance of the microorganism is injected in our body. The immune system therefore is activated to fight the pathogen and displaying a memory, so that should the body get re-infected with the same microorganism, the immune system remembers and attack the microorganism rapidly (AIDS info, 2006).

Types of Preventative vaccines.

Subunits/Component vaccine/Protein vaccine

The subunits are made in the laboratory using genetic engineering techniques. They contain part of the virus not the whole virus. Though the subunits can activate the body's immune response against HIV, they may be too weak to prompt immune effective immune response against future HIV infection (AIDS info, 2006).

Recombinant Vector Vaccine

The HIV virus that do not cause the disease or viruses that are weakened not to cause disease are used to carrier and deliver copies of HIV into the cells of the body. Once they reach the cell, the body produces HIV proteins, with the instruction carried in the copies of the gene. HIV proteins causes immune response against HIV. This method does not deliver all the genes, but several. The immune response may be strong in this case (AIDS info, 2006).

DNA Vaccine

The naked DNA containing HIV genes are injected in the body. The cell uses DNA to produce HIV protein. Anti HIV immune response is triggered by HIV proteins.

Generally, vaccine can be used, alone or in combination, which is called prime boost strategy. The one type of vaccine is administered followed by the other type. The aim is to induce different parts of the immune system (AIDS info, 2006).

Therapeutic HIV/AIDS Vaccine

They are used in treating people who are already infected with HIV. They minimize the need for antiretroviral, but they are not replacing of antiretroviral. They prolong life through boosting the body's immune system.

Who is Eligible for Therapeutic Vaccine?

All the People Living with HIV/AIDS with the strong immune system .The weaker immune system may not respond effectively to HIV therapeutic vaccine. The CD 4 count need to be > 250 CELLS/MM3, though other trials require CD 4 count of 350cell/mm3 (AIDS info, 2006).

Vaccine Side -Effects

All the side effects for HIV vaccine are not known, but it is reported that the vaccine has the side effects as the other vaccines. The side effects are soreness, swelling, redness, pain at the site of the infection, mild flu like symptoms, (fever, chills, muscle pain or weakness, nausea, headache & dizziness.

How are Vaccine Tested

For an HIV vaccine to be considered safe and effective, it has to pass through three phases. Phase I, takes 12 to 18 months and it involves small numbers of volunteers to test the safety of various doses. Phase II involves hundreds of volunteers positive response and safety. There is also phase IIb, Phase III takes three to four years, to complete, and requires thousands of volunteers to test for safety and effectiveness (Avert, 2006). According to (Van Zyl, 2008) before the trials are done on humans they are to be tested for safety.

Vaccine Trial Done

AIDSVAX-The trial was commenced in 1998 and 1999 respectively, in Thailand and America. In the study a single protein, was made to induce protective immunity. The study was completed in 2003. Results showed no beneficial results (Avert, 2006).

STEP and Phambili- In 2004 Canada, USA, Australia, Peru, and South Africa in 2007, tried the vaccine STEP and Phambili, which delivers HIV genes using adenovirus, which causes common flu. The test reached, phases II B and was discontinued. Concerns were raised that the infection with HIV occurred more in those who received the vaccine than those who received the placebo. The other results was that the infection with HIV/AIDS occurred four

times more in uncircumcised men, who received ,vaccine than those who received placebo (Avert, 2006).

ALVAC / AIDSVAX- The third phase of AIDSVAX in combination with ALVAC. The trial started in Thailand in 2006 and completed in 2009. The ALVAX was designed to stimulate cellular immunity. The results of the study indicated that the vaccine prevented 31.2% of the infection. It was concluded that the vaccine provided modest protective effects of the vaccine.

3.13 HIV DIAGNOSIS

There are several methods for detecting HIV infection. Different methods are commonly used in different settings .The HIV virus can be detected through the detection of the antibodies to the virus, viral antigens, virus itself, viral DNA and through culture (Conradie, 2008).

The Detection of the Antibody (Serology)

There are different methods of testing for the antibodies to the virus. Those are Immunofluorescence (IFA) antibody assay, Enzyme Immune Assay (EIA), Rapid test and Saliva test.

Immunofluorescence antibody Assay

The method detects the antibody using the serum reacted with HIV infected cell (Conradie, 2008).

Enzyme Immune Assay / ELISA

This is the preferable method of testing for HIV infection. The first generation of this assay utilized crude HIV 1 lysate to capture the antibodies. The second and the third generation used pure HIV peptides and recombinant antigens to capture antigens. It also detect the IgM (which is the antibody that appears early in the infection. The sensitivity with this assay is (>99.9%) and the specificity is (>99%).Incubation is reduced to over three weeks. The fourth generation of Enzyme Immune Assay detect both the antibodies and p24 antigens in a single test.EIA, which detect HIV antibodies in urine and Saliva, are also available. (Van Zy, 2008). According to (WHOM, 2004) Enzyme Immune Assay are the efficient methods for detecting the virus. They are used in large blood banks and for surveillance studies.

Rapid HIV Test.

These are commonly used in South Africa. They do not require intensive training. The specimen is achieved by the prick on the finger. There are rapid test that uses saliva and urine. The turnaround time is less than ten minutes in some rapid test. There are four types of this assay, which are agglutination, comb/dipstick, flow through membrane and lateral flow membrane (WHO, 2004).

Western Blot

This assay used to be regarded as the preferable methods for conforming HIV infection but it is no longer suitable as it lacks sensitivity when comparing it to the enzyme Immune assay (Van Zyl, 2008).

Virus Detection

P 24 antigen

This is also used to test HIV infection. The antigen can be detected 14-21 days after infection. It is present in the early stage of the infection and falls below undetectable level and detectable again in the last stage of the disease; hence it is not suitable for large scale screening assay (Van Zyl, 2008).

Virus Isolation in a Cell Culture

Cell culture means growing living cells in the laboratory. This methods is used in research or when dealing with problematic cases. There are only two laboratories in South Africa which uses this methods and they are called Bio safety Level 3 (BSL 3). Infection control measures in these laboratories are highly utilized and the air moves from clean area to dirty areas, doors are self closing. The air is filtered before it goes outside to render it pathogen free (Van Zyl, 2008)

In culturing HIV, the lymphocytes from the infected individual, is added to the lymphocytes of an HIV negative individual. After two to three week a cytopathic effects is observed. These are when the donor lymphocytes change in appearance, as a results of the replication of the virus from the infected lymphocytes. The availability of the p24 antigen and the enzyme reverse transcriptase in to the culture indicate the presence of the HI virus (Van zyl, 2008).

The Electron Microscopy.

In order to detect the virus using electron microscopy, one million virus particles per ml of blood is required (Van Zyl, 2008).

Molecular Technique and Nucleic Acid Testing

Polymerase Chain Reaction (PCR)

The methods are able to detect HIV infection approximately 10-16 days after infection. The assay detects the genetic code of the virus using amplification/copying methods. In most cases PCR is used to diagnose HIV infection in infant born to HIV/AIDS mothers. The PCR is also able to detect viral load in the blood (Van Zyl, 2008).

3.14 HIV TYPES, GROUPS AND SUBTYPE

HIV is divided into types, groups and subtypes. There are two types of HIV which are, HVI 1 and HIV 2. HIV1 is responsible for most of the infections. HIV 2 is not easily transmitted and the progression from infection to illness is long. HIV 1 is divided into groups as M group (Major), O group (Outliner), N group and P group. P was discovered 2009 (Avert, 2009).

90% of HIV infection belongs to the M group. These group have nine subtypes, namely subtype A, B, C, D, F, G, H, J, K. Hybrid Virus occur as a results of the combination of the two different subtypes. Most of these strains do not survive well, but the Circulating Recombinant Forms (CRF's) survive. This is those hybrid viruses which infect more than one person (Avert, 2009).

Circulating Recombinant Forms (CRF's) are part of M group. The example of CRF's is CRFA/B which is a combination of subtype A and subtype B. The hybridization between subtypes a and other 'parents' subtype E is known as CRF A/E. Other confuses it and name it subtype E. The correct identification of this CRF is CRF01_AE. A very complex CRF A, G, H, and K was isolated in Cyprus (Avert 2009).

Figure 3. Subtypes and their Predominant Countries

| | |
|---------------------|---|
| Subtype A & CRF A/G | West and Central Africa, Russia |
| Subtype B | Europe, America, Japan, Australia |
| Subtype C | Southern and East Africa |
| Subtype D | East and Central Africa |
| Subtype CRF A/E | South East Asia |
| Subtype F | Central Africa, South America, Eastern Europe |
| Subtype G & A/G | West and East Africa, Central Europe |
| Subtype H | Central Africa |
| Subtype J | Central America |
| Subtype K | Democratic Republic of Congo ,Cameroon |

3.15 ANTIRETROVIRALS

Antiretrovirals are the HIV treatment which's goal is to suppress the viral replication, rejuvenate the immune function, improve the quality of life of those who are infected with HIV/AIDS and reduces the transmission of HIV (Van Dyk, 2004).

According to UNAIDS (2008) the increased access to antiretroviral over the last ten years has resulted with the reduction in the number of HIV/AIDS death. The number of people receiving antiretroviral in low and middle income countries has increased tenfold, reaching 3 million people by the end of 2010. Antiretrovirals, rejuvenated households, community and

the improved quality of life, the increased access to antiretroviral is in line with the declaration commitment to make HIV treatment available in resource limited setting. In 2008 South Africa exceeded a target of 180000 of people living with HIV/AIDS.

Many countries make effort to increase HIV treatment access. Namibia treatment effort was 1% in 2003, and in 2007 88% of people in need of antiretroviral were on antiretroviral. Rwanda treatment access was increased from 1% in 2003 to 71% in 2007 and in Thailand antiretroviral therapy coverage rose from 45 in 2003 to 6% in 2007 (UNAIDS, 2008).

South Africa in increasing access to antiretroviral has accredited Comprehensive Care Management and Treatment (CCMT) of HIV services in all the provinces, there are lot of CCMT in South Africa which are still in the process of being accredited. The challenge in some of the CCMT is the lack of resources, and skills in attaining the declaration commitment. Most CCMT rely on Non- Governmental Organization for the resources.

South Africa is among countries which reached 25%-49% of coverage of antiretroviral therapy among adults and children with advanced HIV and 50%- 75%, coverage of antiretroviral for the prevention of Mother to Child Transmission of HIV/AIDS (UNAIDS, 2008).

Donors as PEPFAR help finance antiretroviral treatment. PEPFAR's goal was to reach 2.5 million people with treatment by 2012. UNTAID also plays a role in scaling up paediatric treatment programmes. Other companies as Global Business Coalition on HIV/AIDS and Setswana in Botswana assist in scaling up treatment. Faith Based Organization also plays a role in scaling up treatment in some other countries (UNAIDS, 2008).

According to the study done in Denmark a young men newly diagnosed with HIV/AIDS is likely to leave additional 35 years with available treatment. Another study in the United Kingdom indicates that the median time for treatment failure for a patient on first line regimen that include one or more protease inhibitors ranges from 4.3 years to 6.5 years, while the median time of the patient started on the regimen containing two Nucleoside Reverse Transcriptase Inhibitors and one Non- Nucleoside Reverse Transcriptase Inhibitor is 13.2 years. Treatment impact is reduced in people who were diagnosed late (UNAIDS, 2008).

WHO recommends that countries use standardized antiretroviral drug regimen consisting of fixed dose combination. First line regimen to include two Nucleoside Reverse Transcriptase Inhibitors and one Non -Nucleoside Reverse Transcriptase Inhibitors. The second therapy to include a protease Inhibitor boosted with ritonavir. Most countries are designing their HIV/AIDS treatment guidelines in line with WHO recommendation (UNAIDS 2008).

WHO recommend that antiretroviral be started when the CD4 count falls below 350 cell per mm³ and that the patient with a CD 4 count of below 200, be put on treatment. The United States department of Health recommend the initiation of antiretroviral in patient with a CD 4 count of less than 350 ml per mm³ and that treatment be commenced in the entire patient who experienced AIDS defining opportunistic illness (UNAIDS 2008).

According to the South African National HIV guidelines antiretroviral can be commenced after treatment readiness assessment, when the CD 4 count is ≤ 200 irrespective of the stage and when the patient is on stage 4 of the WHO HIV staging irrespective of the CD 4 count. The antiretroviral are use in the prevention of HIV transmission and the treatment of HIV/AIDS has the therapeutic and preventative function. Antiretrovirals in fighting HIV/AIDS target their action on different steps of the life cycle. We have different classes of antiretroviral. Other classes are already being used, while others are on trials or still being researched.

It is essential that more antiretroviral studies are conducted to develop antiretroviral which are simple, less toxic and affordable reduce the burden of the disease (UNAIDS, 2008).

Classes of Antiretrovirals

Entry Inhibitors- They is aiming at blocking the interaction of the CD4 T- lymphocytes receptors with the ant receptors of the virus, by blocking the receptor sites (Pierebone, 2006).

Fusion or Penetration Inhibitors-The fusion inhibitors aims at preventing the gp41 from binding with the chemokine receptor. The drugs are to be approved by the FDA. They are Enfuvirtide & Fuzeon (Pierebone, 2006).

Reverse Transcriptase Inhibitors-These drugs prevent HIV enzyme reverse transcriptase from using nucleotide and also attaches to this enzyme to prevent it from functioning. The nucleoside and nucleotide reverse transcriptase inhibitors contain a faulty imitation of the

nucleotide. The imitation building blocks are inserted in the growing chain of DNA instead of the building blocks of DNA. These prevent the double strand of DNA to be completely formed. Non nucleoside reverse transcriptase inhibitors attaches to the enzyme to render it ineffective (Pierebone, 2006).

Integrase Inhibitors- they inhibiting the pre integration complex from entering the DNA (Pierebone, 2006).

Protease Inhibitors -They binds with the protease enzyme making it difficult for the enzyme to cleave or separate the subunits (Pierebone, 2006).

Zinc Finger Inhibitors-These are still being researches and they are aiming at interfering with the packaging of the RNA into the nucleocapsid (Pierebone, 2006).

Potential Antiretroviral agents - are aiming at inhibiting the viral RNA (Pierobone, 2006).

3.15.1 ANTIRETROVIRALS IN THE PREVENTION OF HIV

The Post Exposure Prophylaxis (PEP)

The Post Exposure Prophylaxis in regards to HIV/AIDS is the treatment given to those who are exposed to HI Virus, in order to prevent them from acquiring the infection. The individual can be exposed to the virus, accidentally through occupational exposure or during assaults, as rape. For an example the health care worker can be picked by the contaminated sharp or instrument from the HIV/AIDS infected patient .The sharps may be contaminated from cerebrospinal, peritoneal, synovial, pericardial fluid, blood, semen, vaginal secretions and other fluid from the body.

More health care workers experience occupational exposure to HIV/AIDS. The study done in West Africa report that 45% of health workers sustained accidental blood exposure and 60% of the cases were not reported .In a study done in South Africa at Chris Hani Hospital, 69% of interns sustained one percutaneous, 45% sustained mucocutaneous injuries, while over 60% of these cases were not reported (SAHIVSOC, 2008).

Who is Eligible for PEP?

The matter of who qualifies for PEP, depend on different institutions. The South African national HIV/AIDS guideline, in their discussion of PEP, mentions rape victims and those

exposed to occupational hazards. The protocol is not clear about those who are exposed to HIV/AIDS without being raped (DOH, 2004).

According to (SAHIVSOC, 2008) Individual who is exposed to HIV/AIDS either sexual, occupational or otherwise qualifies for PEP.

The Procedure in Regards to PEP (Occupational Exposure)

The patient and the exposed health care professional are tested for HIV. Pre- counselling is done prior HIV testing. After receiving the results, Post Counselling is provided. In cases where the results of the patient are negative, there is no need for PEP. Where there is a suspicion that the client is on window period, HIV is tested using Polymerase Chain Reaction (PCR). The method tests for viral DNA not the antibodies (DOH, 2004).

In cases where the patient is HIV Positive, and the health care worker is HIV positive, they are both referred for HAART. PEP in patient who is already HIV can jeopardise future treatment. The PEP is initiated when the exposed worker is HIV negative and the patient is HIV positive (DOH, 2004).

In prescribing PEP an assessment need to made on the extend of the risk to contract HIV/AIDS. The risk include an exposure to large inoculums of infected blood, these will be indicated, by the visible injury and visible blood on the device. Terminal infection on the source patient poses a risk to occupational exposure (DOH, 2008).

The Prevention and Control of Occupational Exposure

The occupational exposure to HIV/AIDS can be controlled and managed especially with availability of the infection control protocol. The already contaminated needles with body fluid need to be disposed in a biohazard bin. The needle is not to be recapped. In Intensive Care Unit the ratio of bin to bed need to be at least 1:1 in open ward 2:1. Once the biohazard bin is $\frac{3}{4}$ full, must be exposed. The sterilization of surgical equipment also reduce the risk of occupational exposure to HIV/AIDS (SAHIV, 2008).

PEP and Sexual Assaults

After a report of sexual assaults, the adult receive counselling on the possibilities of infection. There are again Pre Counselling prior HIV infection. After receiving results Post Counselling is offered.

In cases the victims do not want to know their HIV/AIDS status they are allowed to presents within 72 hours to receive, their Post Exposure Prophylaxis. Adherence Counselling ,support and anxiety management are very significant .Especially with sexual assaults cases as this patient get other treatment as pregnancy prophylaxis and sexually transmitted infection (STI) syndrome management (SAHIVSOC, 2008).

Children are given special services different from the adult, by providers with special expertise in managing sexual assaults in children (DOH, 2004). The sexual assaults victims receive 2-drug regimens and 3-drug regimen in cases of risk as multiple perpetrators, obvious trauma to the genital area, anal penetration and when the status of the perpetrators are known to be positive. Post Exposure Prophylaxis regimens according to the South African National HIV/AIDS Guidelines.

| Name of the Drug | Dose | Duration |
|------------------|-----------|----------|
| Zidovudine (AZT) | 300mg bd | 28 days |
| Lamivudine(3TC) | 150 mg bd | 28 days |

In cases of higher risk exposure Protease Inhibitor Kaletra is added to the above regimen.

| Name of the Drug | Dose | Duration |
|--------------------------------------|------------|----------|
| Liponavir/ Ritonavir (Kaletra) | III/III bd | 28 days |

Regimens to be used with PEP According to the (SAHIVSOC, 2008)

Twice a day treatment

| |
|-------------------------------------|
| Staudinger (d4T)+ Lamivudine(3TC) |
| Zidovudine (AZT) + Lamivudine (3TC) |

Once a day treatment

| |
|----------------------------------|
| Tenofovir(TDF) +Emtricitabine(FT |
|----------------------------------|

Third Agent in Cases of 3-Drug Regimen

Twice a day treatment.

| |
|--------------------------------------|
| Lopinavir / Ritonavir |
| Saquinavir / Ritonavir (400 /100 bd) |

Once a Day Treatment

| |
|----------------------------------|
| Efavirenz |
| Atazanavir / Ritonavir |
| Lopinavir / Ritonavir(800 /200) |

The Prevention of Mother to Child Transmission of HIV/AIDS (PMTCT)

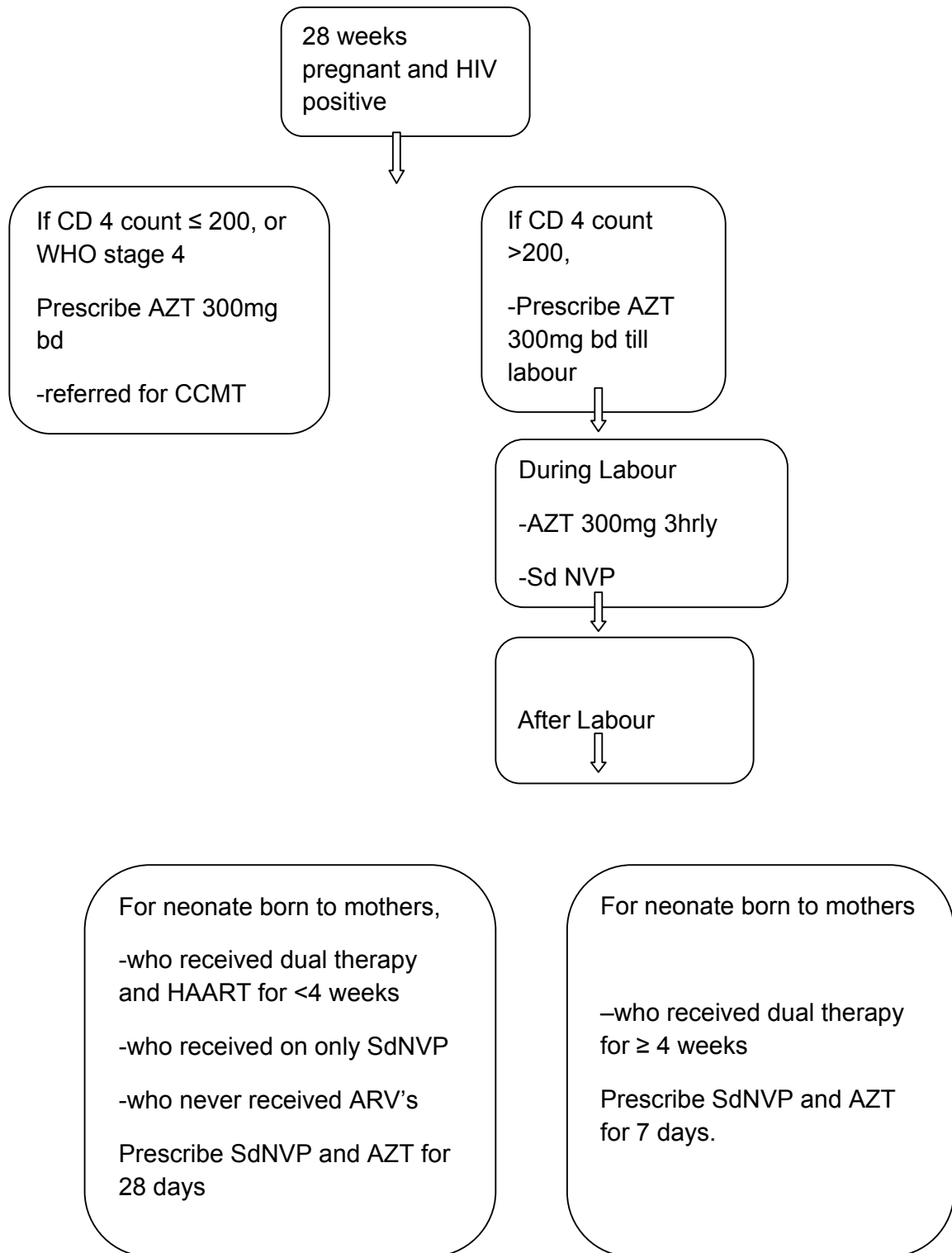
This is the administration of dual therapy to HIV positive pregnant mothers at 28 weeks to reduce the risk of transmission of HIV from the mother to the child. After the positive HIV results. Mothers are prescribed Zidovudine (AZT) 300 mg twice a day while still waiting for the results of CD4 count. The woman with the CD 4 results of ≤ 200 is referred for HAART

and the one with the results of > 200 continue with Zidovudine 300 mg bd till labour (Seedat, 2008).

While in labour the woman is given Sd (NVP) and the women continue with AZT 300 mg every three hours. Immediately after the delivery of the baby, dual therapy is stopped. The focus is now on the newborn (DOH, 2008).

Infant immediately after birth are given Sd (NVP) and Zidovudine is also administered at birth and prescribed for 7 days and 28 days. Zidovudine is administered for 28 days for those infants of mothers who received HAART and dual therapy for < 4 weeks, Sd (NVP) during labour and those who never received antiretroviral. 7 days treatment is prescribed for infants of mothers of mothers who received dual therapy for ≥ 4 weeks (DOH, 2008). The flow diagram below illustrate PMTCT.

Figure 4: Prevention of Mother to Child Transmission of HIV/AIDS



3.15.2 ANTIRETROVIRALS IN THE TREATMENT OF HIV/AIDS

South African public sectors use three regimens as recommended by the World Health Organization, which are regimen 1a, 1b and regimen 2. Mixed regimens are also part of the treatment strategy.

Figure 5. Regimens According to the South African National HIV/AIDS Guideline

| 1A | 1B | 2 |
|------------------|------------------|------------------------------|
| Stavudine(D4T) | Stavudine(D4T) | Zidovudine(AZT) |
| Lamivudine (3TC) | Lamivudine (3TC) | Didanosine (DDI) |
| Efavirenz (EFV) | Nevirapine(NVP) | Lopinavir/Ritonavir(Kaletra) |

N.B With development Kaletra is replaced in many cases by Alluvia and there is a combination of AZT+ 3TC called Lamzid.

3.15.3 ANTIRETROVIRALS, CLASSES, SIDE EFFECTS AND SPECIAL CONSIDERATIONS IN SOUTH AFRICA

Figure 6. Antiretrovirals, Classes, Side effects and Special Considerations.

| NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS | | |
|---|--|-----------------------|
| Name of the drug | Side effect | Special Consideration |
| Stavudine (d4T) | <p>Peripheral neuropathy- Tingling sensation of legs</p> <p>Lactic Acidosis</p> <p>Persistent Nausea ,vomiting and abdominal pain</p> <p>Shortness of breath</p> <p>Tiredness (unexplained)</p> <p>Weight loss</p> <p>Cold and blue(hands, feet)</p> <p>Abnormal heart beat</p> <p>Rapid breathing</p> <p>Lip atrophy- Loss of fat on: Face (sunken cheeks, temples and eyes)</p> <p>Veins more visible on legs and arm Buttocks</p> <p>Few side effects- slight peripheral neuropathy, rash and pancreatitis</p> <p>Initial nausea, vomiting, headache, myalgia- all fades with time</p> <p>Anaemia -paleness</p> | |

| | | |
|------------------|--|--|
| Lamivudine (3TC) | | |
| Zidovudine(AZT) | | |

| | | |
|-----------------|--|--|
| DIDANOSINE(DDI) | Initial nausea, vomiting and headache, pancreatitis (may be fatal) Abdominal discomfort | To be taken without food. (30 minutes before or after food) To be doubled if client weight is above 60 kg |
|-----------------|--|--|

NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS

| Name of the drug | Side Effects | Precaution |
|------------------|----------------|------------|
| Tinofovir (TDF) | Nephrotoxicity | |

NON- NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITOR

| Name of the drug | Side effects | Precautions |
|------------------|---|---|
| Efavirenz (EFV) | Loss of concentration, insomnia, dizziness, delusions, inappropriate behaviour, abnormal dreams. Hallucinations. Rash common in first six weeks. Teratogenic effects- may affect the fetus during | Don't use in pregnancy. To be avoided by clients doing night duty. Don't use with history of mental illness or depression |

| | | |
|------------------|--|---|
| Nevirapine (NVP) | Mild to moderate rash within the first 6 weeks. Hepatitis – liver disease | Do's 2 weekly Liver Function Test(LFT) 4 weekly LFT 8 weekly LFT 3 monthly LFT then 6 monthly LFT Stop NVP if liver enzymes are increasing To be changed if the client contract TB |
|------------------|--|---|

| | | |
|--|--|---|
| | | <p>Not to be used with CD4 of >250 in women and >400 in men</p> <p>Generally all Regimens 1b can be taken with or without food.</p> |
|--|--|---|

PROTEASE INHIBITORS

| Name of the drug | Side effects | Precaution |
|------------------------------------|--|---|
| Lopinavir / Ritonavir (Kaletra) | <p>Hyperadiposity (fat accumulation) at:</p> <p>The back of the neck or upper shoulder(buffalo hump)</p> <p>Abdomen (protease paunchor ,crixivan potbelly)</p> <p>Breast in both men and women</p> <p>Lipomas (fatty growth in different parts of the body.</p> <p>Hyperlipidemia – increase level of cholesterol in blood</p> <p>GI upset : Diarhea,Nausea,Vomitting</p> <p>Hyperglycaemia</p> <p>Headache</p> <p>asthenia</p> | <p>Risk of developing hyperlipidemia can be controlled by:</p> <p>Quitting smoking</p> <p>Avoiding alcohol</p> <p>Exercise</p> <p>Control of blood pressure</p> <p>Low fat diet</p> <p>Kaletra to be avoided in people with history of high cholesterol.</p> <p>Generally kaletra is to be refrigerated</p> |

| | | |
|---------|--|---|
| Alluvia | | <p>or on floors in cases where there is no refrigerator.</p> <p>To be doubled in cases the client contracted TB</p> <p>Can be taken with or without food</p> <p>This replaces Kaletra, in many cases though Kaletra is still used.</p> |
|---------|--|---|

OTHER ARV'S RARELY USED IN THE PUBLIC SECTOR OR NOT USED AT ALL
PROTEASE INHIBITOR

| Name of the drug | Side effects | Precaution |
|------------------|--------------|---|
| Indinavir | | <p>Use in combination with Ritonavir to increase half life.</p> <p>No food restrictions</p> |

| | | |
|-------------------|--|---|
| <p>Nelfinavir</p> | <p>Nephrolithiasis: kidney Stones Unconjugated hyperbilirubinaemia GI disturbances:nausea, diarrhea Hair loss Hyperglycemia (low potential) Headache Dyslipidaemia(Moderate)</p> <p>Diarrhoea Nausea Vomiting Abdominal Pains</p> <p>Hyperglycaemia(low potential) Dyslipidaemia (low potential)</p> | <p>←Drink lot of fluid, at least 1.5 L a day</p> <p>←Monitor Blood Glucose</p> <p>←Risk of developing hyperlipidemia can be controlled by: Quitting smoking Avoiding alcohol Exercise Control of blood pressure Low fat diet</p> <p>Renders oral contraceptives ineffective, use other alternative Take this medication with meals or snacks ←Monitor Blood Glucose</p> <p>←Risk of developing hyperlipidemia can be controlled by: Quitting smoking Avoiding alcohol Exercise Control of blood pressure Low fat diet</p> |
|-------------------|--|---|

| | | |
|---------------|--|--|
| Ritonavir | <p>Hyperglycaemia(High Potential)</p> <p>Dyslipidaemia</p> <p>Paraesthesiae</p> <p>Fatigue</p> <p>Hepatitis</p> <p>Taste perversion</p> <p>Diarrhoea</p> <p>Abdominal Pains</p> | <p>←Monitor Blood Glucose</p> <p>←Risk of developing hyperlipidemia can be controlled by:</p> <p>Quitting smoking</p> <p>Avoiding alcohol</p> <p>Exercise</p> <p>Control of blood pressure</p> <p>Low fat diet</p> |
| Atazanavir | <p>Dyslipidaemia(low potential</p> <p>Unconjugated</p> <p>hyperbilirubinaemia</p> <p>Hyperglycaemia</p> | <p>Take with fatty meal or up to 2 hours after meals</p> <p>To be boosted with Ritonavir</p> |
| Saquinavir | <p>Mild GI disturbances</p> <p>Hyperglycaemia(high potential)</p> <p>Dyslipidaemia (low potential)</p> <p>Headache</p> <p>Elevated tranminases</p> <p>Nausea</p> <p>Diarrhoea</p> <p>Abdominal Pains</p> | |
| Fosamprenavir | | |

| | | |
|--|--|--|
| | Rash, Headache GI upset Hyperglycaemia Dyslipidaemia | |
|--|--|--|

NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITOR

| Name of the drug | Side effects | Precautions |
|--------------------|---|-------------|
| Abacavir (ABC) | Hypersensitivity reaction:fever,rash Gastrointestinal (GI) upset, Hyperlactataemia(Low potential) Cough | |
| Emtricitabine(FTC) | Hyperlactataemia(Low potential) GI upset Hypersentitivity reaction Hyperpigmentation | |

(SAHIVSOC, 2008; AFA, 2007; DOH, 2004)

According to HIV Channel (2009) Entry inhibitors as maraviroc, fusion inhibitor as enfuvirtide and HIV integrase strand transfer inhibitor as raltegravir were recently approved by the FDA.

3.16 ADHERENCE

3.16.1 ADHERENCE TO ANTIRETROVIRALS.

Adherence is defined as the extent which the clients follows prescribed treatment, which was prescribed in a consultative partnership, between the clients and the health care worker (Saloner, 2005).

According to (Fomundam, 2008; NRC, 2008) adherence means taking the medication the way it was prescribed. It means taking medication, keeping appointment, understanding preventative measures as dieting, exercising, substance, use, changing inappropriate behaviour. Adherence is the determinant of survival for the patient on antiretroviral; adherence is second to CD 4 count cell count as the predictor to the progression of AIDS. There is a requirement of up to 100% adherence for the optimal viral suppression.

3.16.2 PREDICTORS OF ADHERENCE

According to Machinery and Bengsburg (2008) full understanding of the predictors of adherence can assist the health care providers to approach non adherence successfully. The first predictor is patient variables. These are socio demographic factors as age, gender, race, ethnicity, income, education, literacy, housing status, insurance status HIV risk factors and psychological factors as mental health, substance use, social climate and support, knowledge and attitudes about HIV and its treatment.

There is conflicting evidence on the association between the socio demographic factors and the adherence behaviour. For example young age, ethnicity and lower income, lower literacy and unstable housing are associated with non – adherence , in research rich setting, while gender, educational level, insurance status and HIV risk factors are associated with adherence behaviour (Machtinger et al., 2008).

Treatment Regimen

According to Machtinger et al. (2008) factors as the number of tablets prescribed the complexity of the regimen, the specific type of the antiretroviral and the medication side effects are discussed below in relation to adherence behaviour. Non adherence is associated with the complexity of the regimen and the side effects. One – daily regimen is reported to have a good impact on adherence. Adjusting the regimen to the patient life style is the

determinant of adherence. The specific type of a pill is not associated with adherence behaviour.

Disease Characteristics.

There is an inconsistent relationship between adherence behaviour and disease characteristic, which is the length of the infection and the stage of the infection. Some studies report increased adherence among patients with history of opportunistic infection, as the experience of infection encourages them to adhere to medication in order to become healthy and not to ever find them in a state they were before. Other studies found the relationship between non-adherence and lower CD 4 count (Machtinger et al., 2008).

Patient Provider Relationship.

Referring to this case there are several issues which may affect adherence as overall satisfaction and trust in the clinic staff or health providers. The patient's opinion on competence, willingness of the health provider, the involvement of the patient in decision making, warmth, openness, concordance of race / ethnicity of the patient and the provider and the adequacy of referrals (Machinery et al., 2008).

According to Machinery et al. (2008) the patient's trust in the physician was associated with increased adherence in two studies of incarcerated women. Other studies illustrated good adherence in cases where the client had a long steady and trusting relationship with a single provider.

Clinical Setting

Machinery et al. (2008) adherence may be influenced by factors such as access to ongoing primary care, involvement in an adherence programme, availability of transportation, availability of childcare, therapeutic environment, convenience appointment, perceived confidentiality, satisfaction with the past experience in the health system. Studies illustrate that dissatisfaction with the prior experience in the health system, is associated with non-adherence.

3.16.3 NON- ADHERENCE TO ANTIRETROVIRALS

Non-adherence to antiretroviral put the patient at risk of AIDS progression, treatment failure as well as the risk of developing drug resistance. Drug resistant leave the individual with

limited treatment options. However non adherence is not only the determinants of treatment failure. There are other factors as genetic differences in drug metabolism, severe baseline immune suppression, prior drug resistance and concurrent opportunistic infection (Machinery & Bangs berg, 2007).

Clients commonly gives the reasons for non adherence as side effects, regimen too complex, dosing not fitting with the daily schedule, forgetfulness, not having time to take medication, oversleeping, missing dose, left medication while away from home, lack of basic information on adherence, uncomfortable taking medication in front of the family friends and co-workers (NRC, 2008).

Factors that are associated with poor adherence in the United States and Europe are as follows depression, active alcohol, drug use, low literacy, lack of social support ,lack of belief in treatment efficacy, unstable housing, Competing priorities(e.g. housing, childcare, food, work (NRC,2008).

According to Machinery et al. (2008) non adherence is associated with psychological factors, psychiatric conditions, active drug use and events as lack of basic drug literacy. The drug literacy in this case refers to the identification of the medication and the description of the relationship between adherence and drug resistance.

3.16.4 BARRIERS TO ADHERENCE TO ANTIRETROVIRALS

According to the study in Botswana which 's aim was to elicit principal barriers to adherence to antiretroviral, 48 % of subject reported that they have missed their dose because of financial constraints, 24% listed forgetting as the primary reason for non adherence. Other barriers included running out of medication (17%), travel migration (13%), side effect (12%) being to busy12%. Weiser, Wolfe, Bangsberg, Thior, Gilbert, Makhema, Kebaabetswe, Dickenson, Mompati, Essex, Marlink (2003).

69% of the respondents did not disclose to their family, 94% kept HIV /AIDS status as secret to the community. 32% reported that they may lose their job, if they can disclose their status to their employers. The participants did not disclose to their families, as they were afraid they will be rejected, ostracized or lose their marriage. Only 15% of the participants reported stigma as a barrier to adherence (Weiser et al., 2003).

According to Nakiyemba, Akurut, Kwasa and Oyaba (2007) distance, transport and finance in order to access the health facility in Uganda were a barrier to adherence. Some of the participants reported they had to travel 50-130km in order to access the health services and some has to cross the river. The participants reported difficulty in getting money for transport hence they did not come for their appointment sometimes. Other barriers to adherence mentioned where poverty, waiting time. Stigma and discrimination were not reported as a huge barrier to adherence though it exists.

3.16.5 VIROLOGICAL AND CLINICAL IMPLICATION OF ADHERENCE

Virological Implications of Adherence

Full viral suppression lead to maximal reconstitution and the maintenance of the immune system and minimize the emergence of drug resistant virus. It is envisaged that the $\geq 95\%$ adherence is necessary for the full suppression of the virus. The near perfect $\geq 95\%$ requires that the patient does not miss or substantially delay three doses of medication. It is a challenge for most of the patient to maintain this level of adherence (Machinery et al., 2008). In a study of 866 participants done in British Columbia. It was found out that near perfect level of adherence is required for reliable viral suppression. Of 502 participants at 95-100% adherence 84% achieved plasma viral load of < 500 copies/ml whereas 64% of the 64 subjects at 90 - $< 95\%$ achieved level of suppression($p=0.001$) (Machinery et al., 2008).

The association between adherence and virological control was investigated, in a study of 34 HIV positive patients, who were taking antiretroviral including protease inhibitors over 3 months. It was found out that 10% decrease in adherence lead to the doubling of the viral load. Small difference in adherence can lead to major differences in virological control. Though not thoroughly studied it is reported that regimens as ritonavir – boosted PI based and Nucleoside Reverse Transcriptase Inhibitors may suppress the virus even at lower rate of adherence (Machtinger et al., 2008).

Clinical Implications of Adherence

Many studies has proven adherence to be associated with clinical outcomes and the laboratory markers as CD 4 count. In a prospective cohort study of 1,095 subjects, who were enrolled in randomized multicentre trials of initial and salvage therapy. It was found out that patient who reported 100% , 80-99%, and 0-79 % adherence rate had a CD 4 count

improvement of 179,159, 53 cells/uL respectively from baseline to 12 months(Machtinger et al., 2008).

According to Machtinger et al. (2008) non- adherence is associated with increased mortality. A study which was measuring adherence discovered that no patient with >90 adherence progressed to AIDS over the 13 months follow- up period, compared to those who are 51-90% adherence and 41with \leq 50% adherence. Non-adherence in other studies was associated with hospitalization and mortality.

3.16.6 TREATMENT READINESS ASSESMENT

In their National HIV/AIDS guideline the Department of Health requires that before starting the patient on antiretroviral, the drug readiness must be assessed. The drug readiness assessment includes medical, social and psychological assessment. The medical assessment includes the treatment of opportunistic infections and the assessment of the CD 4 count. The social assessment incorporates the issues as the home environment and whether the clients have disclosed. It is recommended by the national HIV /AIDS guideline that the patient must at least disclose to one person before starting antiretroviral (DOH, 2008).

The psychological assessment assesses whether the patient accepted the HIV status. All the assessment has to be achieved in three sessions that the patient is appointed to attend. During these three sessions the patient is again assessed for the knowledge on the information given. The cotrimoxazole pill count is performed. The multidisciplinary team play a role in these sessions (DOH, 2008).

According to Saloner (2005) the medical assessment during drug readiness assessment should includes gynaecological examination. Information on the adherence history of the patient will be essentials, for example it will be appropriate to ask if the clients was ever on long term treatment as hypertensive treatment or contraceptive pills ,in order to plan for adherence intervention.

Different factors which may influence adherence behaviour need to be assessed, for example life style, occupation, travel, routine and sleep pattern. The information on the kind of work, the patient is doing will assist in the planning of the treatment. A person who works night

duty may not be placed on the regimen containing efavirenz, as it can lead to drowsiness and lack of concentration.

According to NRC (2008) Treatment readiness assessment is essential before starting the patient on antiretroviral. Patient 'willingness to start antiretroviral, ability to take long term treatment and willingness to accept antiretroviral side effects are part of treatment assessment Patient's support system as the family and friends plays an important role in assisting the patient to adhere to antiretroviral. They remind the patient on the time of taking medication and help the clients deal with the side effects.

Given the information on side effects, the patient may describe the side effects that she/he is willing to accept thus assisting the physician tailoring selection of antiretroviral for individual patient. Information is provided on the strategies for the management of side effects, before starting with the treatment.

In assessing whether the clients will be able to adhere to antiretroviral, adherence trials can be done using placebo tablets and jelly beans. The trial will help patient understand what it means to take the tablets daily and adjust the lifestyle to accommodate the regimens prescribed. The disadvantage of the placebo trials is that they do not have the side effects as the antiretroviral (NRC, 2007).

3.16.7 ADHERENCE SUPPORT

Close follow up of the patient is significant, especially after the first few days of starting the therapy. This will assist the care providers to identify side effects, assess the comprehension on the treatment and assist identify concerns which may become adherence barriers. The follow up can be done either by the telephone, clinic visit, or other forms of contact. It is essential to deal with each and every person as an individual to optimize outcomes. Pharmacist, peer counsellors, support groups, adherence counsellors, behavioural intervention, community based case managers, are useful in supporting adherence to antiretroviral (NCR, 2008).

Multidisciplinary teams that include nurses, case managers, nutritionist and pharmacist are, in which health care provider focuses on adherence during their session with the clients are effective way of supporting adherence. It envisaged that adherence decline in cases where

focus intervention is discontinued. During follow up visit it is important to encourage those who are adhering well and share improvement in patient's health, for example the improvement in CD4 count and viral load (NCR, 2008).

Empowering those living with HIV/AIDS through skill development can play a role in enhancing adherence. It will be difficult for a hungry person to take pills all the time, besides some of the antiretroviral, has some dietary restriction. An empowered individual can take of his own needs. The provision of grants will be necessary for those clients who are sick and they cannot do for themselves. The participation in support group and the availability of the support partner will enhance adherence to antiretroviral.

Ongoing adherence can help enhance adherence. Pill count and patient self report at every appointment help to identify non adherent patient and these assists in early intervention.

Devices to Support Adherence

Medication organizers as pill boxes and medisets are good devices for use in adherence support. The clients fill them every week in such a way she/he is able to recognize the missed doses. Reminder devices such as alarm watches, beepers, cell phones and alarms are useful in reminding the patient when to take medication. Diary can be used to record medication already taken. Visual medication schedule, with the images of medication on them, are effective as reminding the patient of tablets (NCR, 2008).

A particular television programme can be selected, to remind the clients about taking the medication however the problem may occur if the programme is discontinued or has changed its time. Many people who are reminded by children to take tablets, reported children to be good as reminders of adherence.

3.16.8 ADHERENCE COUNSELLING AND PATIENT EDUCATION

It is envisaged that the patient who knows their medication and their dosage have a high adherence rate. The education can be through graphics, verbal or written. The education on antiretroviral includes dietary restrictions, possible side effects and their management. The importance of maximum adherence to prevent the risk of virological failure is stressed during this phase (NCR, 2008).

A study done in England with 116 participants, suggest that education improves adherence .The study assigned group of participants to intervention and control group. The intervention group received individualised education counselling at baseline and ongoing session's .The information was provided on treatment adherence and resistance. The strategies of solving encountered challenges were discussed during ongoing counselling. The control group received standard of care clinical follow –up.

The results at 48 weeks indicated a ≥ 95 % of adherence among 94% of the intervention group versus 645% of the control group. The viral load results of the 89% of the intervention group was < 400 copies/ml, as compared to 66% of the control group (Machtinger et al., 2008).

It is reported that antiretroviral adherence is maximised when the health care workers dedicate time with the patient to plan for and support medication adherence.

According to the Standard operating procedure illustrated in Family Health International (FHI) (2004). The patient has to undergo three sessions of adherence counselling before starting with antiretroviral. The sessions include the information on HIV/AIDS, antiretroviral, resistance, importance of adherence, disclosure, reminders of adherence, healthy living and barriers to adherence. The prescribed tablets are discussed with the patient. A follow up session after starting antiretroviral is required.

In trying to prevent failure among HIV/AIDDS infected adult initiating antiretroviral therapy Davies, Koenig, Stratford, Palmore, Bush, Golde, Melatino, Todd-Turner and Veller brock (2006) conducted a study at the infectious disease programme of Grady Health System in Atlanta, whereby the so called HEART project was implemented among HIV positive who were eligible for antiretroviral.

HEART is the abbreviation of Helping Enhance Adherence to Retroviral Therapy. The HEART was implemented before the initiation of the therapy. The HEART involves two sessions of counselling before initiating therapy and other three sessions during the course of the therapy. During the first session clients are educated on HIV and therapy.HIV resistance is explained. It is ensured that before living the session, the clients know what is resistance (Davies et al., 2006).

The second session is about assessment of the clients' life style, in order to intergrate the life style with the therapy. The other three sessions are during the course of the therapy. The clinical nurse discusses the barriers to adherence with the clients. After discussion of the barrier, the plan is to make to help the patient adhere. The clients are seen as responsible for their own health, the relationship is not authoritarian. At the same time the clients are respected and receive autonomy support (Davies et al., 2006).

According to Davies et al. (2006), the HEART project involves the use of support partners. Before the participants are initiated on treatment they are requested to bring the support partner, 90% of the participants were able to find the support partners; only 24 reported not finding the partner. Support partners are one of the underutilized resources in adherence counselling. Their function is to support the clients in reminding them about medication taking, either by telephone calls and help with reminders as the alarms. They can also collect the clients' medication; in cases the clients are unable to do that for that day. The other role of the support partners is motivational.

The support partners are encouraged to attend, at least one of the first two sessions and two of the four sessions. In our study those sessions were attended especially the first sessions. The HEART project also had six group meeting, which was coordinated by the HIV positive peer advocates. The intervention group were required to attend at least two of the sessions (Davies et al., 2006).

The HEART project is informed by problem solving theory, self determination theory and cognitive research on prospective memory. Experience on adherence and clinical were integrated into this intervention. The HEART project according to the study has proven to be effective (Davies et al., 2006).

Stenson, Charalambous, Dwadwa, Pemba, Du Toit, Raggaley, Grant and Churchyard (2005) conducted a study in one of the mines in South Africa to determine the understanding of the patient on ART's, and the perception of the patient Health professionals on counselling process.

The counselling included three steps. The first step which is the preparation for the ART, introduction to antiretroviral, risk, benefits and social ramification. The second step which

was prior to starting antiretroviral reassessed knowledge and discussed patient's decision on whether to start. The third step, which was after starting antiretroviral, addressed progress and problems encountered (Stenson et al., 2005).

90 % of the respondents scored 6/7 on the adherence questioners, 100% reported taking medication on daily basis. 88% has knowledge of the regimen and doses. There is a need to equip the patient with information in order for them to adhere to antiretroviral and to empower them to care for their lives (Stenson et al., 2005).

According to NRC (2008) patient education should encourage the patient to take the medication as prescribed, the importance of taking all the medication to attain maximum viral suppression and avoidance of the risk of developing drug resistance, encourage the clients to notify the clinic if they miss their doses, discuss the ways to improve adherence and adherence support, educate the patient on side effects, the reporting of the side effects and the way to reduce the side effects.

It is very important during the adherence counselling that patient adherence strategies are emphasised, which are the keeping of appointment, the reporting of the side effects, the acceptance of the HIV/AIDS status, the acceptance that antiretroviral are lifelong treatment, realistic expectation of antiretroviral, belief in the benefits of antiretroviral, joining of support groups and religious organization for support, disclosing, the use of reminders as discussed above, the importance of not mixing antiretroviral with any other medications, without consulting the doctor.

3.16.9 INTERVENTION DURING ADHERENCE COUNSELLING

The health care provider helps the client, to acquire, information, attitudes, skills and behaviour to ensure adherence. The health care provider set objectives, prioritise, limit objectives to be tackled with each intervention. The readiness to change is addressed. It is important that the comprehension and understanding is assessed.

Instructional Strategy

Information is effective if it is provided according to the need of the patient. The verbal communication which increases understanding are used for example, the health care provider need to be clear, concise, and explicit, categorise, and repeat important context, use of

dialogue, test understanding and comprehension. Written instruction and educational material are given (Fomundam, 2008).

Behavioural Strategies.

To ensure that the patient adopt and maintain health behaviour, the health provider develop the management plan. The patient is encouraged to monitor him/herself. The clients are informed on the clinical improvement. The treatment regimen is simplified. The family and friends care is integrated in the process of support (Fomundam, 2008).

Motivational and Empowerment Strategies.

It is envisaged that adherence tends to decrease towards baseline and with the cessation of intervention. The approach to motivate and empower the clients are as follows: Help the clients to adopt new approach, belief attitude and value. In appropriate beliefs that are congruent to the expected belief are pointed out. Increase knowledge were appropriate .Motivate the patient according to their value system. Encourage in times of failure. Involve the patient in the development of the management plans and the setting of the goals. Help the patient take credit for the good outcome. Facilitate problem solving and self monitoring (Fomundam, 2008).

To ensure that the patient keeps appointment, negotiate the appointment time and interval with the patient. During referral, explain about the referral .The specifying of the names of the health professionals, the clients are referred to encourage keeping of appointment. The waiting period during the visit is to be shortened. Reminders, phone calls, community health workers can remind the clients of the appointment (Fomundam, 2008).

3.16.10 MEASURING ADHERENCE

There are several measures used to measure adherence which are ,Medication Event Monitoring System, Pill Count, Biological markers, assay, medication refill refill data ,Self Report as Morisky Scale, Visual Scale Analogue, CPCRA measures, the last three days recall method, and Direct Observed Treatment(DOT).

Bell, Kapitao, Sikwese & Lallo (2007) used pill count; self reported adherence and Medication Events Monitoring System in measuring adherence. The pill count was calculated

as follows: tablets dispensed minus tablets returned divide by tablets prescribed, multiply by hundred.

MEMS record the time of the container opening. It uses computer chip embedded in a pill bottle cap .The calculation is as follows, the number of bottle opening events divided by the prescribed number of doses multiply by 100. In cases where the number of the opening events was more than the prescribed dose, the data was adjusted so that the opening events equals to the prescribed doses in a day. An opening events repeated within four hours was taken as single events.

Both Pill Count and Medication Events Monitoring System can over estimates and underestimates adherence. For example the clients may remove pills from the container before pill count. With MEMS the clients may open the container take the tablets out, but not drink the tablets. MEMS may undermine adherence, in cases where the clients may take several tablets out for other days or to the other small containers.

According to Machtiger et al. (2008) self report is another method of assessing adherence. It is very effective when it is used by a neutral person who is not a member of the clinical staff member. Clients tend to tell the truth about their adherence behaviour, if they are in a comfortable environment and trusting the interviewer.

The disadvantage with this method is that clients can lie about adhering to antiretroviral. Studies report that self report of good adherence has a limited value as a predictor of adherence, while self report of poor adherence is regarded as a predictor of poor adherence. Clients may self report being adherent in a fear of being labelled as disobedience (NCR, 2008).

The China AIDS Response (CARES) study which's purpose was to describe the prevalence of adherence in China, to identify factors associated with adherence and to compare self report measures of adherence used CPRA adherence self report measures, a 7 day visual analogue scale (VAS). With VAS the participants were required to mark on the 10 cm line, which was labelled 0% to 100% in 10 interval, 0% indicates the clients are not taking medication at all, 50% indicate the clients are taking half of the medication and 100%

indicate the client is taking all the medication. Wang, He, Li, .Yang, Chen, Fenni, Williams (2008).

The study ,which 's aim was to test the validity, sensitivity and specificity of the pill count methods with respect to viral load measurement and to explore other factors threatening high treatment adherence level was conducted in Mozambique ' DREAM programme(Drug Resource Enhancement against AIDS and Malnutrition. Pill count in the study was done on the participants > 15 years, receiving first line antiretroviral therapy. The participants were observed for 12 months Lio, Carbini, Germano, Guidotti, Mancinelli, Magid, Narciso, Palombi, Renzi, Zimba &Marazzi (2008).

In measuring adherence Kouanfack, Laurent , Peytavin , Ciaffi, Ngolle, Nkene, Essomba , Calmy , Ngole , Delaporte, Koulla- Shiro (2008) used self report and nevirapine Plasma Level Concentration(biological marker). The nevirapine minimal plasma concentration was measured 12 hours after the last intake. This was done after every 6 months till months 36 for every patient receiving the FDC of nevirapine. A concentration of 4000 ng/ml, was judged as accurate adherence. The nevirapine minimal plasma concentration was measured using validated reverse -phase high performance liquid chromatographycoupled with ultraviolet detection assay, while plasma HIV-1VIRAL load was determined using Bayer branched DNA (BDNA) HIV -1 Quantiplex assay (Bayer Diagnostic Emeryville, CA) version 3.0 (Limit of quantification of 50 copies/ml).

The medication refill method can be used to measure adherence. Pharmacist dispenses medication for a particular period and the dates for the next appointment are always given. In cases where the refills are not obtained in timely fashion, it is assumed that the patient may not be adhering to antiretroviral (Machtiner et al., 2008).

Direct Observed Treatment (DOT)

According to Fomundam (2008) the clients while she/he is observed. The observation may be done by the health care workers. Many patients are not comfortable with this method, as soma feels it takes control from them. The method seems to violate patient's autonomy and privacy.

Other methods

Another method illustrated by Fomundam (2008) is assays, assays measure drug level in blood, urine, breath, or saliva in measuring adherence to antiretroviral. The patient outcomes can be used to measure adherence. The improvement in the CD 4 count and the suppressed viral load may suggest adherence to antiretroviral.

3.17 COUNSELLING

Jacob John as cited in Saloner (2005) describes counselling as the communication that requires person to person conversation, with one of the key roles of the counsellor, being to listen to the patient uninterruptly during the appointment time.

Saloner (2005) report that during counselling the clients is able to be open ,shares his emotions, fears, guilt and anxieties. In short counselling can be defined as a way of enabling clients to recognise, accept and resolve problems. Counselling can be done by health workers, social worker, psychologist and trained lay counsellors. Counselling can be done to provide information during pre and post counselling, when a counsellor identify a problem and when the clients report to have problems.

Skills of a Counsellor

According to Killian (2009) empathy, listening, reflecting, attentive behaviour,, reflecting feeling, questioning, summarising and problem solving. The counsellor also needs to create a safe space and always introduce herself. In dealing with the clients, the helper needs to create an environment which will encourage communication. The setting must have privacy and no interruption. The counsellor need to adopt caring attitudes, smile, shake hands with the clients and introduce herself to the clients.

Empathy

This is trying to understand what the clients are going through. It is very important to be non judgmental and understand what the clients is feeling (Kallian, 2009).

Listening

Listening means hearing and understanding what the clients is saying .It is very important to pay attention to what it is said. Listening includes listening and encouraging the clients through verbal and non verbal communication (Kallian, 2009).

Reflection

According to Kallian (2009) reflection involves developing the picture of what the clients is feeling and experiencing. During reflection what is understood is communicated to the clients to check, whether it is correct.

Attentive behaviour

According to Kallian (2009) attentive behaviour suggest to the clients whether she is listened or not. The important attentive behaviour is eye contact, attentive body language as encouraging gestures, vocal qualities and verbal track.

Questioning

In counselling questioning is necessary for the clients to open up. Open ended questions allow the clients to give expanded response. The counsellor in the process gets more information from the clients (Kallian, 2009).

Summarising

According to Kallian (2009) summarising is connecting experiences, feeling, behaviour and subsequent events. The helper must check if the clients agree with the summary. It is very appropriate to summarise when moving to a new topic, or at the end of the session.

Problem solving

The clients is encouraged to take responsibility of the problem and encouraged through the various steps in solving the problem, as understanding the problem, setting goals, brainstorming, identifying pros and cons of the brainstormed option and the take action. The taken action is then evaluated and followed by future plans in the next session (Kallian, 2009).

Robert Carkhuff as cited in Saloner (2005) explores steps in counselling as attending, responding, and personalizing. Attending refers to prompting the clients' own attentiveness. Responding means responding to the content and the meaning. Personalising is to enable the clients to understand where he/she is in relation to where he wants to be.

The counsellor according to David Muller as cited in Saloner (2005) has to be able to have confidentiality, to always be accessible, have a non-judgmental perspective and a consistency

in approach to the individual. Counsellors need to be trained in order to meet these requirements (Saloner, 2005).

3.18 PRE AND POST TEST COUNSELLING

HIV counselling is the giving of information to the clients regarding HIV/AIDS, in order to assist them to make an informed decision as far as HIV/AIDS testing is concerned. HIV counselling is divided into pre-counselling and post-counselling testing.

Pre –Counselling Test

This is the type of counselling where the clients are prepared for the HIV test and its outcomes. The clients are informed on the pros and cons of HIV/AIDS counselling. The basic information on HIV is provided to the clients. That is the information on what is HIV/AIDS, the mode of transmission, the preventative strategies and the available support services. According to Saloner (2005) the information given to the clients will depend on the background information that the clients already have.

The HIV counselling explores the content of the HIV test. Clients are given information on the HIV test, and the clients are allowed to ask questions. The implication of the test is discussed with the client.

Saloner (2005) in her work explains the many implications the HIV status may have on the individuals. The example of this implication is the psychosocial and financial implication. The risk assessment is done. The clients' possible risk of contracting HIV/AIDS is assessed. The information on healthy life styles is given to avoid the risk of contracting the disease. The clients are assured. It is very important to enquire from the clients on what will he do if she finds out of their HIV status.

AfA (2004) report that the clients need to be assured on the confidentiality of the test results, and the test results will not be disclosed to the other parties without the client's consent. The DOH (1999) in their draft of National HIV/AIDS policy indicated several conditions in which HIV/AIDS testing should be carried out, with the consent from the clients and without consent from the clients. The clients have to issue the consent in a situation "devoid of coercion". The client must feel free to refuse and agree for HIV test.

Post - Test Counselling

During post – test counselling the client is given the results of the test and assured depending on the results. Post –counselling is done irrespective of the negative and positive results. Saloner (2005) report that the service provider in giving the results need to be calm and professional. In cases of the HIV positive results the service provider need to support and provide to the clients information on the available services and help the clients can receive. For the antiretroviral programme available and other services which may be of assistance to the clients.

In dealing with the clients during this counselling session the provider of service should expect different emotion from the clients as anger, fear, shock, denial. It is very appropriate that the clients is allowed to express his emotions Saloner (2005).

There is a lot of stigma attached to HIV/AIDS; in that case it may not be an easy step for the clients to accept their HIV/AIDS status. The service provider ‘s role in this case is to assure the clients and try to clarify whatever concerns and misconception the clients is having on HIV/AIDS. Care must be taken not to give false hopes to the clients.

The feeling of the clients in regards to his status, either negative or positive need to be discussed. Information on the preventive strategies and life style changes need to be emphasized. The post –counselling is to be followed by an ongoing counselling, to assess how the clients are coping and address other clients concerns. Ongoing counselling sessions will depend on the individual patient.

CHAPTER 4

4. ANALYSIS OF DATA AND THE DISCUSSION OF FINDINGS

4.1 DEMOGRAPHIC DATA

Figure 7. Illustration of Demographic Variables

| VARIABLES | N51 (%) |
|--------------------------|------------|
| AGE | |
| 15-49 | 44(86, 6%) |
| >49 | 7(13, 7%) |
| GENDER | |
| MALE | 14(27, 5%) |
| FEMALE | 37(72, 5%) |
| MARITAL STATUS | |
| SINGLE | 26(51, 0%) |
| MARRIED | 13(25, 5%) |
| DIVORCED | 6(11, 8%) |
| COHABITING | 6(11, 8%) |
| ENGAGED | 0(0, 0%) |
| LITERACY LEVEL | |
| NEVER ATTENDED SCHOOL | 3(5, 9%) |
| PRIMARY EDUCATION | 6(11, 8%) |
| SECONDARY EDUCATION | 25(49, 0%) |
| TERTIARY EDUCATION | 17(33, 3%) |
| EMPLOYMENT STATUS | |
| UNEMPLOYED | 22(43, 1%) |
| PENSIONER | 0(0, 0%) |
| GOVERNMENT GRANT | 0(0, 0%) |
| EMPLOYED | 28(54, 9%) |
| RETRENCHED | 0(0, 0%) |
| NO RESPONSE | 1(2, 0%) |
| RESIDENTIAL AREA | |

| | |
|---------------------------------------|-------------|
| TOWNSHIP | 24(47, 1%) |
| SURBURB | 6(11, 8%) |
| TOWNSHIP / SURBURB | 15(29, 4%) |
| INFORMAL SETTLEMENT | 0(0, 0%) |
| OTHER | 5(9, 8%) |
| NO RESPONSE | 1(2, 0%) |
| DISCLOSER | |
| FAMILY | 48(94, 1%) |
| FRIENDS | 22(43, 1%) |
| COLLEAGUE | 3(5, 9%) |
| SATISFACTION WITH SUPPORT FROM | |
| HEALTH PROFESSIONALS | 41(80, 4%) |
| FAMILY | 49(96, 1%) |
| FRIENDS | 17(33, 3%) |
| COLLEAGUE | 3(5, 9%) |
| ALCOHOL CONSUMPTION | |
| YES | 2(3, 9%) |
| NO | 37(72, 5%) |
| OCCASIONAL | 11(21, 6%) |
| NO RESPONSE | 1(2, 0%) |
| DRUG USE | |
| YES | 0(0, 0%) |
| NO | 51(100, 0%) |
| LENGTH OF TREATMENT IN MONTHS | |
| 6 months or less | 0(0, 0%) |
| >6 months - 12 months | 21(41, 2%) |
| >12 months - 24 months | 17(33, 3%) |
| >24 months - 36 months | 5(9, 8%) |
| >36 months | 7(13, 7%) |
| No response | 1(2, 0%) |
| NUMBER OF PILLS A DAY | |
| | 0(0, 0%) |

| | |
|---------|------------|
| 1 PILL | 2(3, 9%) |
| 2 PILLS | 2(3, 9%) |
| 3 PILLS | 24(47, 1%) |
| 4 PILLS | 20(39, 2%) |
| 5 PILLS | 0(0, 0%) |
| 6 PILLS | 3(5, 9%) |
| 7 PILLS | |
| 8 PILLS | |

Age

Forty four (86, 6%) patients were from the age of 15 to 49 year old and seven (13, 7%) of the patients were over 49 years old.

Gender

Fourteen (27, 5%) patients were male and thirty seven (72, 5%) were female.

Marital status

Twenty six (51, 0%) patients were single, married (13 or 25, 5%), divorced (6 or 11, 8%) and cohabiting (6 or 11, 8%).

Literacy level

Three (5, 9%) never attended school, primary education (6 or 11, 8%), secondary education (25 or 49, 0%) and tertiary education (17 or 33, 3%).

Employment status

Twenty two (43, 1%) were unemployed, Twenty eight (54, 9%) were employed and one (2, 0%) did not indicate their employment status.

Residential area

Twenty four (47, 1%) of the patients were living in a township, suburb (6 or 11, 8%), township / suburb (15 or 29, 4%), other (5 or 9, 8%) and one (2, 0%) did not give an answer as to where he/she lives.

Discloser

Forty eight (94, 1%) disclosed to their family, 22 (43, 1%) to friends and 3 (5, 9%) to colleague.

Satisfaction with support from

Forty one (80, 4%) were satisfied with the support from health professionals, 49 (96, 1%) were satisfied with the support from the family, 17 (33, 3%) were satisfied with the support from friends and 3 (5, 9%) were satisfied with the support from colleagues.

Alcohol Consumption

Of the fifty one patients interviewed, two (3, 9%) of the patients interviewed said they consume alcohol, thirty seven (72, 5%) said they don't consumer alcohol, eleven (21, 6%) said they drink occasionally and one (2, 0%) patient did not respond to the question.

Drug Use

All the respondents said they do not use drugs.

Length of treatment in months

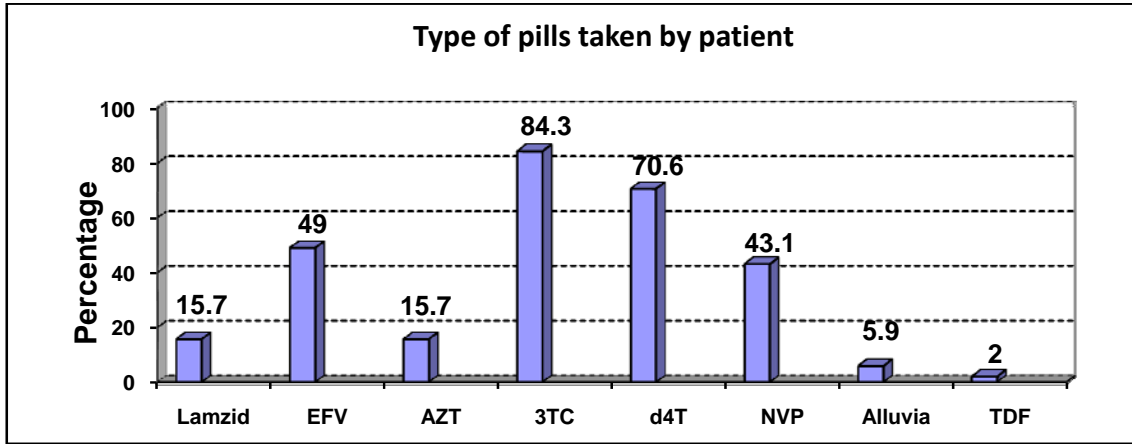
No patient had a treatment for 6 months or less, twenty one (41, 2%) were in treatment for more than 6 months to 12 months, seventeen (33, 3%) were in treatment for more than 12 months to 24 months, five (9, 8%) were in treatment for more than 36 months and one (2, 0%) did not respond.

Number of Pills a day

Two patients (3,9%) drank 3 pills, the other two (3,9%) drank 4 pills, twenty four (47,1%) drank 5 pills, twenty (39,2%) drank 6 pills, and three (5,9%) drank 8 pills.

4.2 PILLS TYPES

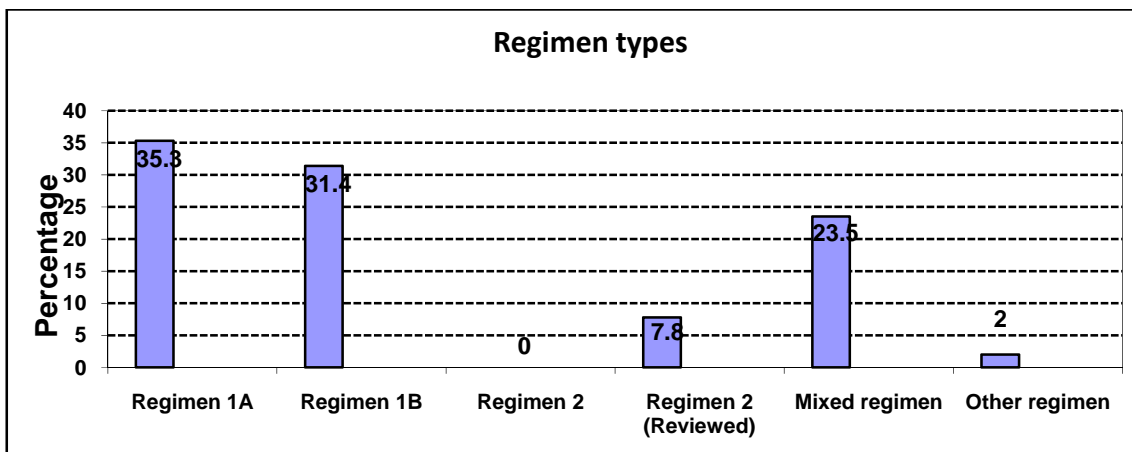
Figure 8. Type of Pills taken by the Patient



Eight (15, 7%) patients were taking Lazed, EFV (25 or 49, 0%), AZT (8 or 15, 7%), 3TC (43 or 84, 3%), d4T (36 or 70, 6%), NVP (22 or 43, 1%), Alluvia (3 or 5, 9%) and TDF (1 or 2, 0%).

4.3 REGIMEN TYPE

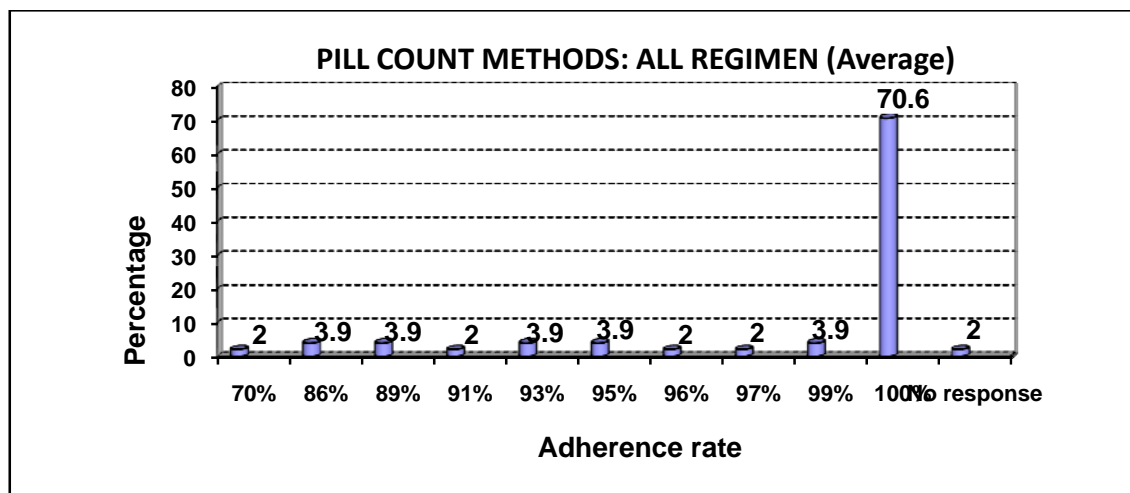
Figure 9. Regimen Types



Eighteen (35, 3%) patients were taking regimen 1A, regimen 1B (16 or 31, 4%), regimen 2 (0 or 0, 0%), regimen 2(Reviewed) (4 or 7, 8%), mixed regimen (12 or 23, 5%) and other regimen (1 or 2, 0%).

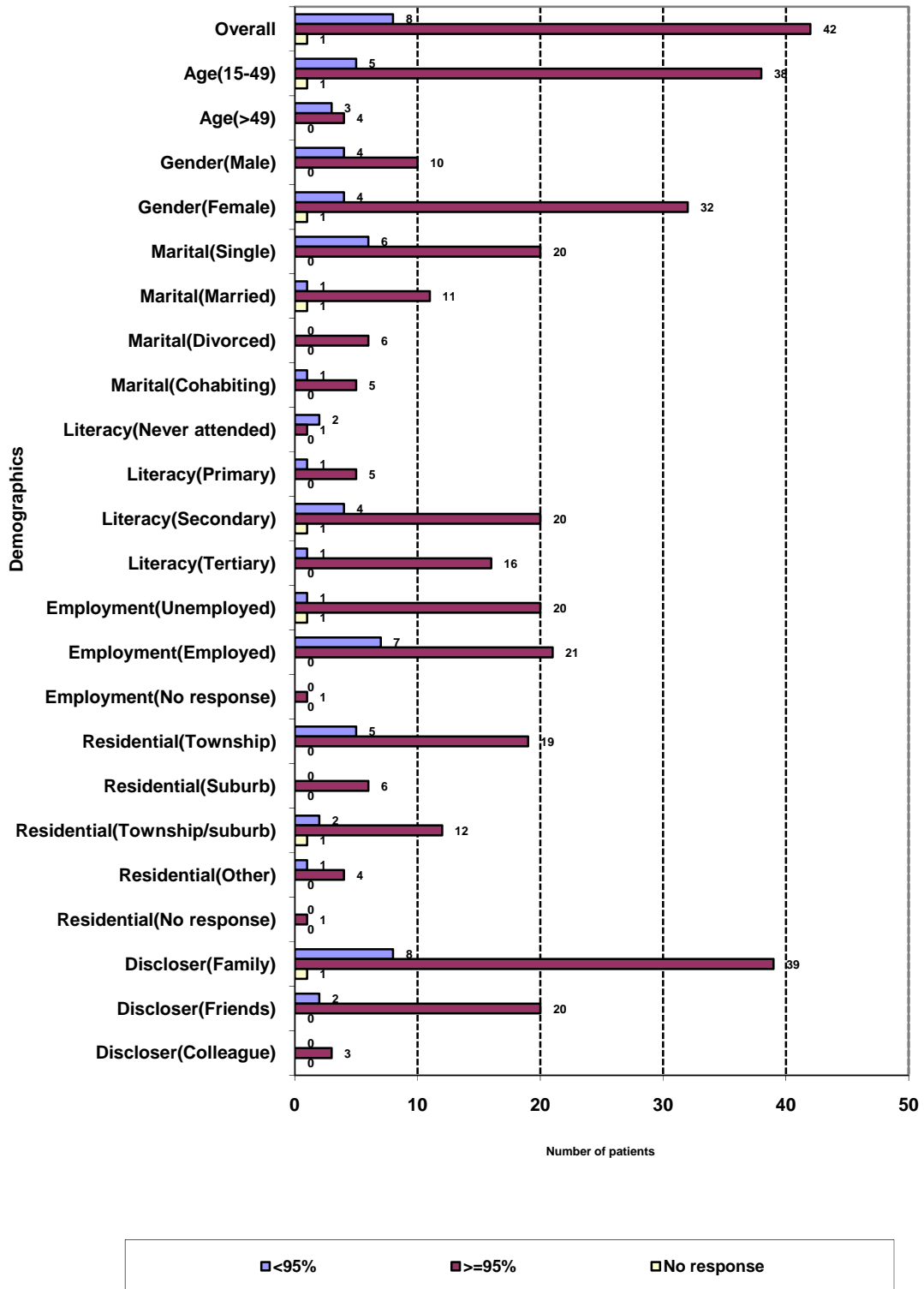
2.6.4 PILL COUNT METHOD ANALYSIS

Figure 10. Analysis of Pill Count



One (2%) patient had 70% adherence, 2 (3,9%) had 86% adherence, 2 (3,9%) had 89% adherence, 1 (2,0%) had 91% adherence, 2 (3,9%) had 93% adherence, 2 (3,9%) had 95% adherence, 1 (2,0%) had 96% adherence, 1 (2,0%) had 97% adherence, 2 (3,9%) had 99% adherence, 36 (70,6%) had 100% adherence and 1 (2,0%) did not respond.

FIGURE 11. Adherence (Pill Count Method) vs demographics



Overall, 42 patients had the adherence of more or equals to 95%, 8 patients had adherence of less than 95% and 1 did not respond.

Age

Of the 44 patients of the age 15 to 49, 38 had the adherence of more or equals 95%, 5 had the adherence of less than 95% and 1 did not respond.

Of the 7 patients of the age above 49, 4 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

Gender

Of the 14 patients who were male, 10 had the adherence of more or equals 95% and 4 had the adherence of less than 95%.

Of the 37 patients who were female, 32 had the adherence of more or equals 95%, 4 had the adherence of less than 95% and 1 did not respond.

Marital status

Of the 26 patients who were single, 20 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 13 patients who were married, 11 had the adherence of more or equals 95%, 1 had the adherence of less than 95% and 1 did not respond.

All the 6 divorced patients had the adherence of more or equal 95%.

Of the 6 patients who were cohabiting, 5 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

Literacy level

Of the 3 patients who never attended school, 1 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

Of the 6 patients who had primary education, 5 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

Of the 25 patients who had secondary education, 20 had the adherence of more or equals 95%, 4 had the adherence of less than 95% and 1 did not respond.

Of the 17 patients who had tertiary education, 16 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

Employment status

Of the 22 patients who were unemployed, 20 had the adherence of more or equals 95%, 1 had the adherence of less than 95% and 1 did not respond.

Of the 28 patients who were employed, 21 had the adherence of more or equals 95% and 7 had the adherence of less than 95%.

The only patient who did not respond to the employment status had the adherence more or equals 95%.

Residential area

Of the 24 patients who were living in township, 19 had the adherence of more or equals 95% and 5 had the adherence of less than 95%.

All the 6 patients who were living in suburb had the adherence more or equal 95%.

Of the 15 patients who were living in township/suburb, 12 had the adherence of more or equals 95%, 2 had the adherence of less than 95% and 1 did not respond.

Of the 5 patients who were living at other residential area, 4 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

The only patient who did not respond to the residential area had the adherence more or equal 95%.

Discloser

Of the 48 patients said the disclosed to family, 39 had the adherence of more or equals 95%, 8 had the adherence of less than 95% and 1 did not respond.

Of the 22 patients said the disclosed to friends, 20 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

All the 3 patients said the disclosed the colleague had the adherence more or equal 95%.

Satisfaction with support from

Of the 41 patients who said they were satisfied with the support from health professional, 34 had the adherence of more or equals 95%, 6 had the adherence of less than 95% and 1 did not respond.

Of the 49 patients who said they were satisfied with the support from family, 40 had the adherence of more or equals 95%, 8 had the adherence of less than 95% and 1 did not respond.

Of the 17 patients who said they were satisfied with the support from friends, 15 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

All the 3 patients who said they were satisfied with the support from colleague had the adherence more or equal 95%.

Alcohol Consumption

All the 2 patients who said they consume alcohol had the adherence more or equal 95%.

Of the 37 patients who said they do not consume alcohol, 30 had the adherence of more or equals 95%, 6 had the adherence of less than 95% and 1 did not respond.

Of the 11 patients who said they consume alcohol occasionally, 9 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

The only patient who did not respond to the alcohol consumption had the adherence more or equal 95%.

Drug Use

All the 51 patients said they do not use drugs, 42 had the adherence of more or equals 95%, 8 had the adherence of less than 95% and 1 did not respond.

Length of treatment in months

Of the 21 patients who had treatment for more than 6 months to 12 months, 19 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

Of the 17 patients who had treatment for more than 12 months to 24 months, 12 had the adherence of more or equals 95%, 4 had the adherence of less than 95% and 1 did not respond.

All of the 5 patients who had treatment for more than 24 months to 36 months had the adherence of more or equals 95%.

Of the 7 patients who had treatment for more than 36 months, 6 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

The only patient who did not respond to the length of treatment had the adherence of more or equal 95%.

Number of Pills a day

All the 2 patients who took 3 pills had the adherence of more or equal 95%.

All the 2 patients who took 4 pills had the adherence of more or equal 95%.

Of the 24 patients who took 5 pills, 18 had the adherence of more or equals 95%, 5 had the adherence of less than 95% and 1 did not respond.

Of the 20 patients who took 6 pills, 18 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

Of the 3 patients who took 8 pills, 2 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

Regimen type

Of the 18 patients who took regimen 1A, 13 had the adherence of more or equals 95%, 4 had the adherence of less than 95% and 1 did not respond.

Of the 16 patients who took regimen 1B, 13 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

All the 4 patients who took regimen 2 (reviewed) had the adherence of more or equal 95%.

Of the 12 patients who took mixed regimen, 11 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

The only patient who took other regimen had the adherence of more or equals 95%.

Type of pills taken by patient

All the 8 patients who took Lamzid had the adherence of more or equal 95%.

Of the 25 patients who took EFV, 20 had the adherence of more or equals 95%, 4 had the adherence of less than 95% and 1 did not respond.

Of the 8 patients who took AZT, 7 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

Of the 43 patients who took 3TC, 34 had the adherence of more or equals 95%, 8 had the adherence of less than 95% and 1 did not respond.

Of the 36 patients who took d4T, 27 had the adherence of more or equals 95%, 8 had the adherence of less than 95% and 1 did not respond.

Of the 22 patients who took NVP, 19 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

All the 3 patients who took Alluvia had the adherence of more or equal 95%.

The only patient who took TDF had the adherence of more or equals 95%.

Figure 12. All Percentage of Pill Count in Relation to Demographics

| | | PILL COUNT METHODS (ADHERENCE): ALL REGIMEN (Average) | | | | | | | | | | |
|-----------------------|----|--|----------|-----------|----------|-----------|----------|----------|-----------|-----------|-----------|--------------------|
| | N | 70% | 86 % | 89% | 91% | 93% | 95% | 96 % | 97% | 99% | 100 % | No Respo nse |
| Total | 51 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 36 | 1 |
| Age | | | | | | | | | | | | |
| 15-45 | 44 | 0 | 2 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 33 | 1 |
| | | 0,0 % | 4,5 % | 2,3 % | 2,3 % | 2,3 % | 4,5 % | 2,3 % | 0,0 % | 4,5 % | 75,0 % | 2,3% |
| >45 | 7 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 0 |
| | | 14,3 % | 0,0 % | 14,3 % | 0,0 % | 14,3 % | 0,0 % | 0,0 % | 14,3 % | 0,0 % | 42,9 % | 0,0% |
| Gender | | | | | | | | | | | | |
| Male | 14 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 7 | 0 |
| | | 7,1 % | 7,1 % | 14,3 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 7,1 % | 14,3 % | 50,0 % | 0,0% |
| Female | 37 | 0 | 1 | 0 | 1 | 2 | 2 | 1 | 0 | 0 | 29 | 1 |
| | | 0,0 % | 2,7 % | 0,0 % | 2,7 % | 5,4 % | 5,4 % | 2,7 % | 0,0 % | 0,0 % | 78,4 % | 2,7% |
| Marital status | | | | | | | | | | | | |
| Single | 26 | 1 | 2 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 18 | 0 |
| | | 3,8 % | 7,7 % | 3,8 % | 0,0 % | 7,7 % | 0,0 % | 3,8 % | 3,8 % | 0,0 % | 69,2 % | 0,0% |
| Married | 13 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 9 | 1 |
| | | 0,0 % | 0,0 % | 7,7 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 15,4 % | 69,2 % | 7,7% |

| | | | | | | | | | | | | |
|--------------------------|----|-----------|----------|----------|-----------|-----------|-----------|----------|----------|----------|------------|------|
| Divorced | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| | | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 100, 0% | 0,0% |
| Cohabiting | 6 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | 0 |
| | | 0,0 % | 0,0 % | 0,0 % | 16,7 % | 0,0 % | 33,3 % | 0,0 % | 0,0 % | 0,0 % | 50,0 % | 0,0% |
| Literacy Level | | | | | | | | | | | | |
| Never attend school | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 33,3 % | 0,0 % | 0,0 % | 0,0 % | 33,3 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 33,3 % | 0,0% |
| Primary Education | 6 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | 0 |
| | | 0,0 % | 0,0 % | 0,0 % | 16,7 % | 0,0 % | 33,3 % | 0,0 % | 0,0 % | 0,0 % | 50,0 % | 0,0% |
| Secondary Education | 25 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 17 | 1 |
| | | 0,0 % | 8,0 % | 8,0 % | 0,0 % | 0,0 % | 0,0 % | 4,0 % | 4,0 % | 4,0 % | 68,0 % | 4,0% |
| Tertiary Education | 17 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 15 | 0 |
| | | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 5,9 % | 0,0 % | 0,0 % | 0,0 % | 5,9 % | 88,2 % | 0,0% |
| Employment Status | | | | | | | | | | | | |
| Unemployed | 22 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 17 | 1 |
| | | 0,0 % | 4,5 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 4,5 % | 4,5 % | 4,5 % | 77,3 % | 4,5% |
| Employed | 28 | 1 | 1 | 2 | 1 | 2 | 2 | 0 | 0 | 1 | 18 | 0 |
| | | 3,6 % | 3,6 % | 7,1 % | 3,6 % | 7,1 % | 7,1 % | 0,0 % | 0,0 % | 3,6 % | 64,3 % | 0,0% |
| No response | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 100, 0% | 0,0% |

| | | % | % | % | % | % | % | % | % | % | 0% | |
|-------------------------|----|------|------|------|-------|------|------|------|------|------|--------|------|
| Residential Area | | | | | | | | | | | | |
| Township | 24 | 0 | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 2 | 14 | 0 |
| | | 0,0% | 8,3% | 8,3% | 0,0% | 4,2% | 4,2% | 4,2% | 4,2% | 8,3% | 58,3% | 0,0% |
| Suburb | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| | | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 100,0% | 0,0% |
| Township / suburb | 15 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 11 | 1 |
| | | 6,7% | 0,0% | 0,0% | 0,0% | 6,7% | 6,7% | 0,0% | 0,0% | 0,0% | 73,3% | 6,7% |
| Other | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| | | 0,0% | 0,0% | 0,0% | 20,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 80,0% | 0,0% |
| No response | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 100,0% | 0,0% |
| Disclosure | | | | | | | | | | | | |
| Family | 48 | 1 | 2 | 2 | 1 | 2 | 2 | 0 | 1 | 2 | 34 | 1 |
| | | 2,1% | 4,2% | 4,2% | 2,1% | 4,2% | 4,2% | 0,0% | 2,1% | 4,2% | 70,8% | 2,1% |
| Friends | 22 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 18 | 0 |
| | | 0,0% | 4,5% | 0,0% | 0,0% | 4,5% | 0,0% | 4,5% | 0,0% | 4,5% | 81,8% | 0,0% |
| Colleagu e | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| | | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 100,0% | 0,0% |

| | | | | | | | | | | | | |
|---------------------------------------|----|------|------|------|------|------|------|------|------|-------|--------|------|
| | | % | % | % | % | % | % | % | % | % | 0% | |
| Satisfaction with support from | | | | | | | | | | | | |
| Health Professionals | 41 | 1 | 2 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 29 | 1 |
| | | 2,4% | 4,9% | 4,9% | 0,0% | 2,4% | 4,9% | 0,0% | 2,4% | 4,9% | 70,7% | 2,4% |
| Family | 49 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 34 | 1 |
| | | 2,0% | 4,1% | 4,1% | 2,0% | 4,1% | 4,1% | 2,0% | 2,0% | 4,1% | 69,4% | 2,0% |
| Friends | 17 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 14 | 0 |
| | | 0,0% | 5,9% | 0,0% | 0,0% | 5,9% | 0,0% | 0,0% | 0,0% | 5,9% | 82,4% | 0,0% |
| Colleague | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| | | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 100,0% | 0,0% |
| Alcohol Consumption | | | | | | | | | | | | |
| Yes | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 50,0% | 50,0% | 0,0% |
| No | 37 | 0 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 27 | 1 |
| | | 0,0% | 5,4% | 2,7% | 2,7% | 5,4% | 2,7% | 0,0% | 2,7% | 2,7% | 73,0% | 2,7% |
| Occasional | 11 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 7 | 0 |
| | | 9,1% | 0,0% | 9,1% | 0,0% | 0,0% | 9,1% | 9,1% | 0,0% | 0,0% | 63,6% | 0,0% |
| No Response | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 100,0% | 0,0% |
| Drug Use | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|--|---|-----|-----|-----|-----|-----|------|-----|-----|-----|-------|------|
| No | 5 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 36 | 1 |
| | 1 | | | | | | | | | | | |
| | | 2,0 | 3,9 | 3,9 | 2,0 | 3,9 | 3,9 | 2,0 | 2,0 | 3,9 | 70,6 | 2,0% |
| | | % | % | % | % | % | % | % | % | % | % | |
| Length of treatment in months | | | | | | | | | | | | |
| 12 months or less | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 15 | 0 |
| | 1 | | | | | | | | | | | |
| | | 4,8 | 4,8 | 4,8 | 0,0 | 0,0 | 4,8 | 0,0 | 0,0 | 9,5 | 71,4 | 0,0% |
| | | % | % | % | % | % | % | % | % | % | % | |
| More than 12 months but less or equals 24 months | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 9 | 1 |
| | 7 | | | | | | | | | | | |
| | | 0,0 | 5,9 | 5,9 | 5,9 | 5,9 | 5,9 | 5,9 | 5,9 | 0,0 | 52,9 | 5,9% |
| | | % | % | % | % | % | % | % | % | % | % | |
| More than 24 months | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 11 | 0 |
| | 2 | | | | | | | | | | | |
| | | 0,0 | 0,0 | 0,0 | 0,0 | 8,3 | 0,0 | 0,0 | 0,0 | 0,0 | 91,7 | 0,0% |
| | | % | % | % | % | % | % | % | % | % | % | |
| No Response | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | | | | | | | | | | | |
| | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 100,0 | 0,0% |
| | | % | % | % | % | % | % | % | % | % | % | |
| Number of Pills a day | | | | | | | | | | | | |
| 3 pills | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| | | | | | | | | | | | | |
| | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 50,0 | 0,0 | 0,0 | 0,0 | 50,0 | 0,0% |
| | | % | % | % | % | % | % | % | % | % | % | |
| 4 pills | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | | | | | | | | | | | | |
| | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 100,0 | 0,0% |
| | | % | % | % | % | % | % | % | % | % | % | |
| 5 pills | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 15 | 1 |
| | 4 | | | | | | | | | | | |
| | | 0,0 | 4,2 | 8,3 | 4,2 | 4,2 | 4,2 | 0,0 | 4,2 | 4,2 | 62,5 | 4,2% |

| | | % | % | % | % | % | % | % | % | % | % | |
|---------|----|-----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|------|
| 6 pills | 20 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 16 | 0 |
| | | 0,0 % | 5,0 % | 0,0 % | 0,0 % | 5,0 % | 0,0 % | 5,0 % | 0,0 % | 5,0 % | 80,0 % | 0,0% |
| 8 pills | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | | 33,3 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 0,0 % | 66,7 % | 0,0% |

Age

Of the 44 patients of the age 15 to 49, 2 had 86% adherence, 1 had 89% adherence, 1 had 91% adherence, 1 had 93% adherence, 2 had 95% adherence, 1 had 96% adherence, 2 had 99% adherence, 33 had 100% adherence and 1 did not respond.

Of the 7 patients of the age above 49, 1 had 70% adherence, 1 had 89% adherence, 1 had 93% adherence, 1 had 97% adherence and 3 had 100% adherence.

Gender

Of the 14 patients who were male, 1 had 70% adherence, 1 had 86% adherence, 2 had 89% adherence, 1 had 97% adherence, 2 had 99% adherence and 7 had 100% adherence.

Of the 37 patients who were female, 1 had 86% adherence, 1 had 91% adherence, 2 had 93% adherence, 2 had 95% adherence, 1 had 96% adherence, 29 had 100% adherence and 1 did not respond.

Marital status

Of the 26 patients who were single, 1 had 70% adherence, 2 had 86% adherence, 1 had 89% adherence, 2 had 93% adherence, 1 had 96% adherence, 1 had 97% adherence and 18 had 100% adherence.

Of the 13 patients who were married, 1 had 89% adherence, 2 had 99% adherence, 9 had 100% adherence and 1 did not respond.

All 6 the divorced patients had 100% adherence.

Of the 6 patients who were cohabiting, 1 had 91% adherence, 2 had 95% adherence and 3 had 100% adherence.

Literacy level

Of the 3 patients who never attended school, 1 had 70% adherence, 1 had 93% adherence and 1 had 100% adherence.

Of the 6 patients who had primary education, 1 had 91% adherence, 2 had 95% adherence and 3 had 100% adherence.

Of the 25 patients who had secondary education, 2 had 86% adherence, 2 had 89% adherence, 1 had 96% adherence, 1 had 97% adherence, 1 had 99% adherence, 17 had 100% adherence and 1 did not respond.

Of the 17 patients who had tertiary education, 1 had 93% adherence, 1 had 99% adherence and 15 had 100% adherence.

Employment status

Of the 22 patients who were unemployed, 1 had 86% adherence, 1 had 96% adherence, 1 had 97% adherence, 1 had 99% adherence, 17 had 100% adherence and 1 did not respond.

Of the 28 patients who were employed, 1 had 70% adherence, 1 had 86% adherence, 2 had 89% adherence, 1 had 91% adherence, 2 had 93% adherence, 2 had 95% adherence, 1 had 99% adherence and 18 had 100% adherence.

The only patient who did not respond to the employment status had the adherence of 100%.

Residential area

Of the 24 patients who were living in township, 2 had 86% adherence, 2 had 89% adherence, 1 had 93% adherence, 1 had 95% adherence, 1 had 96% adherence, 1 had 97% adherence, 2 had 99% adherence and 14 had 100% adherence.

All 6 patients who were living in suburb had 100% adherence.

Of the 15 patients who were living in township/suburb, 1 had 70% adherence, 1 had 93% adherence, 1 had 95% adherence, 11 had 100% adherence and 1 did not respond.

Of the 5 patients who were living at other residential area, 1 had 91 and 4 had 100% adherence.

The only patient who did not respond to the residential area had the adherence of 100%.

Discloser

Of the 48 patients said the disclosed to family, 1 had 70% adherence, 2 had 86% adherence, 2 had 89% adherence, 1 had 91% adherence, 2 had 93% adherence, 2 had 95% adherence, 1 had 97% adherence, 2 had 99% adherence, 34 had 100% adherence and 1 did not respond.

Of the 22 patients said the disclosed to friends, 1 had 86% adherence, 1 had 93% adherence, 1 had 96% adherence, 1 had 99% and 18 had 100% adherence.

All the 3 patients said the disclosed the colleague had the adherence of 100%.

Satisfaction with support from

Of the 41 patients who said they were satisfied with the support from health professional, 1 had 70% adherence, 2 had 86% adherence, 2 had 89% adherence, 1 had 93% adherence, 2 had 95% adherence, 1 had 97% adherence, 2 had 99% adherence, 29 had 100% adherence and 1 did not respond.

Of the 49 patients who said they were satisfied with the support from family, 1 had 70% adherence, 2 had 86% adherence, 2 had 89% adherence, 1 had 91% adherence, 2 had 93% adherence, 2 had 95% adherence, 1 had 96% adherence, 1 had 97% adherence, 2 had 99% adherence, 34 had 100% adherence and 1 did not respond.

Of the 17 patients who said they were satisfied with the support from friends, 1 had 86% adherence, 1 had 93% adherence, 1 had 99% adherence and 14 had 100% adherence.

All the 3 patients who said they were satisfied with the support from colleague had the adherence of 100%.

Alcohol Consumption

Of the 2 patients who said they consume alcohol, 1 had 99% adherence and 1 had 100% adherence.

Of the 37 patients who said they do not consume alcohol, 2 had 86% adherence, 1 had 89% adherence, 1 had 91% adherence, 2 had 93% adherence, 1 had 95% adherence, 1 had 97% adherence, 1 had 99% adherence, 27 had 100% adherence and 1 did not respond.

Of the 11 patients who said they consume alcohol occasionally, 1 had 70% adherence, 1 had 89% adherence, 1 had 95% adherence, 1 had 96% adherence and 7 had 100% adherence.

The only patient who did not respond to the alcohol consumption had the adherence of 100%.

Drug Use

All the 51 patients said they do not use drugs, 1 had 70% adherence, 2 had 86% adherence, 2 had 89% adherence, 1 had 91% adherence, 2 had 93% adherence, 2 had 95% adherence, 1 had 96% adherence, 1 had 97% adherence, 2 had 99% adherence, 36 had 100% adherence and 1 did not respond.

Length of treatment in months

Of the 21 patients who had treatment for a year or less, 1 had 70% adherence, 1 had 86% adherence, 1 had 89% adherence, 1 had 95% adherence, 2 had 99% adherence and 15 had 100% adherence.

Of the 17 patients who had treatment for more than a year but less or equals to two years, 1 had 86% adherence, 1 had 89% adherence, 1 had 91% adherence, 1 had 93% adherence, 1 had 95% adherence, 1 had 96% adherence, 1 had 97% adherence, 9 had 100% adherence and 1 did not respond.

Of the 12 patients who had treatment for more than two years, 1 had 93% adherence and 11 had 100% adherence.

The only patient who did not respond to the length of treatment had the adherence of 100%.

Number of Pills a day

Of the 2 patients who took 3 pills, 1 had 95% adherence and 1 had 100% adherence.

The 2 patients who took 4 pills had 100% adherence.

Of the 24 patients who took 5 pills, 1 had 86% adherence, 2 had 89% adherence, 1 had 91% adherence, 1 had 93% adherence, 1 had 95% adherence, 1 had 97% adherence, 1 had 99% adherence, 15 had 100% adherence and 1 did not respond.

Of the 20 patients who took 6 pills, 1 had 86% adherence, 1 had 93% adherence, 1 had 96% adherence, 1 had 99% adherence and 16 had 100% adherence.

Of the 3 patients who took 8 pills, 1 had 70% adherence and 2 had 100% adherence

4.5 LAST THREE DAYS RECALL METHOD ANALYSIS

Figure 13. Analysis of Last Three Days Methods

In the last three days did you take all your tablets as prescribed?

| YES | NO |
|------------|----------|
| 50(98, 0%) | 1(2, 0%) |

Fifty (98, 0%) patients said yes and only one (2, 0%) said no.

4.6 MORISKY SCALE

Figure 14. Analysis of Moresby Scale

| | Never | Rarely | Sometimes | Often | Always |
|---|--------------|-------------|-----------|-----------|-----------|
| 1. Do you ever forget to take your medications? | 29 56,9% | 18 35,3% | 4 7,8% | 0 0,0% | 0 0,0% |
| 2. Are sometimes careless about taking your medication? | 45 88,2% | 3 5,9% | 3 5,9% | 0 0,0% | 0 0,0% |
| 3. When you feel better, do you sometimes stop taking your Medications? | 51 100,0% | 0 0,0% | 0 0,0% | 0 0,0% | 0 0,0% |
| 4. Sometimes, if you feel worse when you take your medication, do you stop taking them? | 51 100,0% | 0 0,0% | 0 0,0% | 0 0,0% | 0 0,0% |

1. Do you ever forget to take your medications?

Four (7, 8%) patients said sometimes, eighteen (35, 3%) said rarely and twenty nine (56, 9%) said never.

2. Are sometimes careless about taking your medication?

Three (5, 9%) patients said sometimes, three (5, 9%) said rarely and forty five (88, 2%) said never.

3. When you feel better, do you sometimes stop taking your Medications?

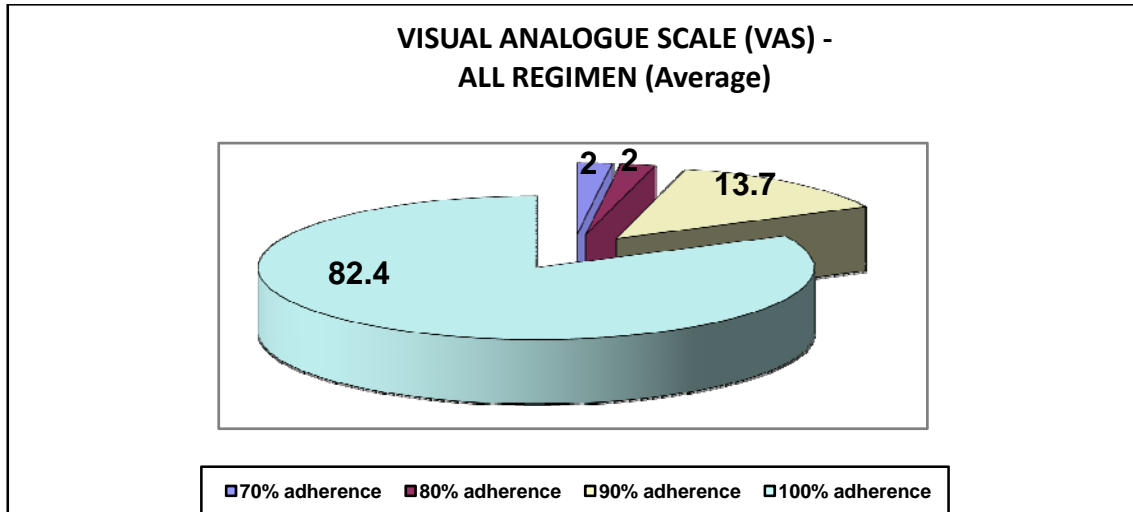
All the patients said never.

4. Sometimes, if you feel worse when you take your medication, do you stop taking them?

All the patients said never.

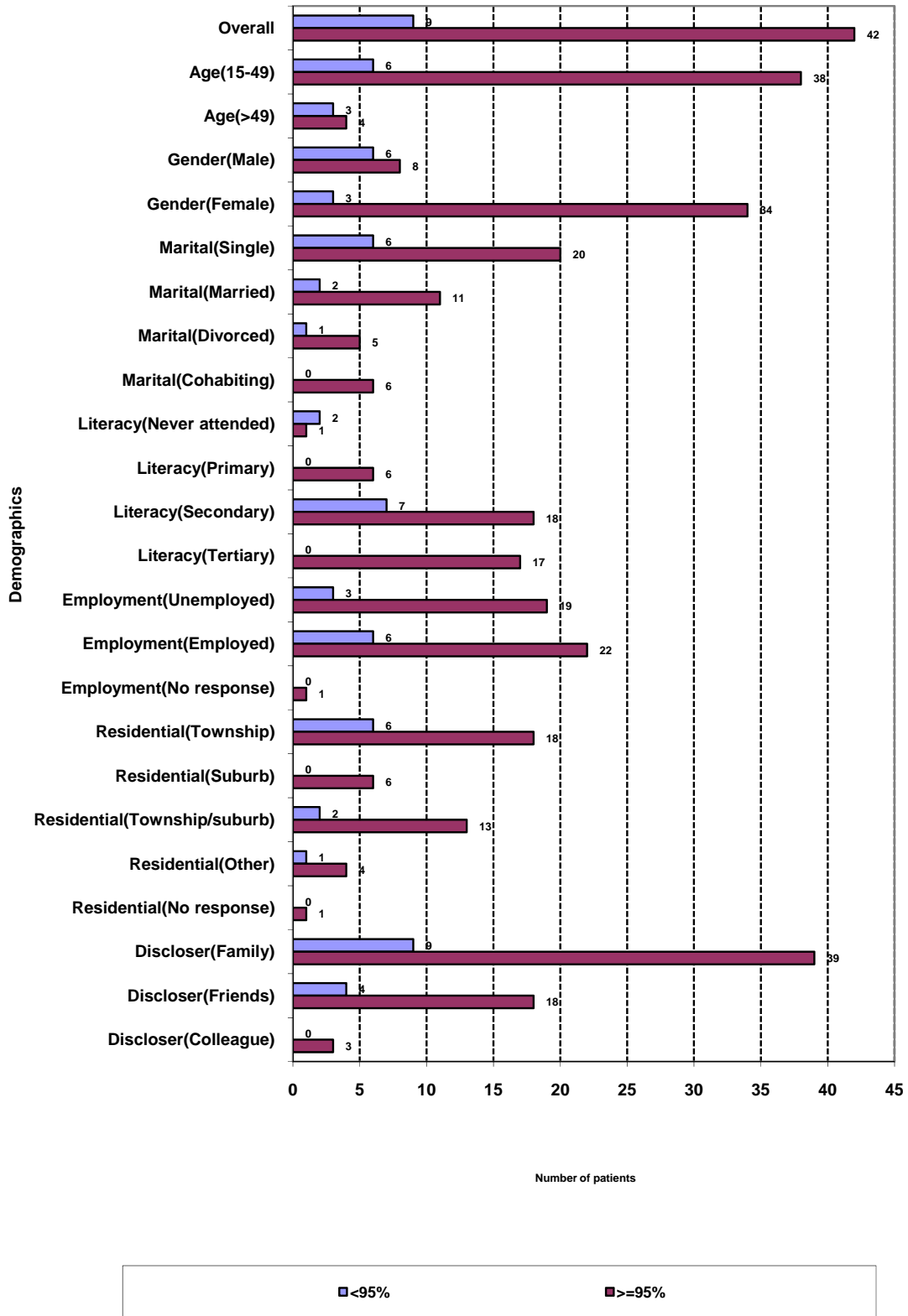
4.7 VISUAL ANALOGUE SCALE (VAS)

Figure 15. Analysis of VAS



On average 42 (82, 4%) of the patients had a 100% adherence, 7 (13, 7%) had 90% adherence, 1 (2, 0%) had 80% adherence and 1 (2, 0%) had 70% adherence.

Figure 16 Adherence (VAS) vs demographics



Overall, 42 patients had the adherence of more or equals to 95% and 9 patients had adherence of less than 95%.

Age

Of the 44 patients of the age 15 to 49, 38 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 7 patients of the age above 49, 4 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

Gender

Of the 14 patients who were male, 8 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 37 patients who were female, 34 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

Marital status

Of the 26 patients who were single, 20 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 13 patients who were married, 11 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

Of the 6 patients who were divorced, 5 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

All the 6 patients who were cohabiting had the adherence of more or equal 95%.

Literacy level

Of the 3 patients who never attended school, 1 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

All the 6 patients who had primary education had the adherence of more or equal 95%.

Of the 25 patients who had secondary education, 18 had the adherence of more or equals 95% and 7 had the adherence of less than 95%.

All the 17 patients who had tertiary education had the adherence of more or equal 95%.

Employment status

Of the 22 patients who were unemployed, 19 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

Of the 28 patients who were employed, 22 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

The only patient who did not respond to the employment status had the adherence more or equals 95%.

Residential area

Of the 24 patients who were living in township, 18 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

All the 6 patients who were living in suburb had the adherence more or equal 95%.

Of the 15 patients who were living in township/suburb, 13 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

Of the 5 patients who were living at other residential area, 4 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

The only patient who did not respond to the residential area had the adherence more or equal 95%.

Discloser

Of the 48 patients said the disclosed to family, 39 had the adherence of more or equals 95% and 9 had the adherence of less than 95%.

Of the 22 patients said the disclosed to friends, 18 had the adherence of more or equals 95% and 4 had the adherence of less than 95%.

All the 3 patients said the disclosed the colleague had the adherence more or equal 95%.

Satisfaction with support from

Of the 41 patients who said they were satisfied with the support from health professional, 32 had the adherence of more or equals 95% and 9 had the adherence of less than 95%.

Of the 49 patients who said they were satisfied with the support from family, 40 had the adherence of more or equals 95% and 9 had the adherence of less than 95%?

Of the 17 patients who said they were satisfied with the support from friends, 14 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

All the 3 patients who said they were satisfied with the support from colleague had the adherence more or equal 95%.

Alcohol Consumption

All the 2 patients who said they consume alcohol had the adherence more or equal 95%.

Of the 37 patients who said they do not consume alcohol, 31 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 11 patients who said they consume alcohol occasionally, 8 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

The only patient who did not respond to the alcohol consumption had the adherence more or equal 95%.

Drug Use

All the 51 patients said they do not use drugs, 42 had the adherence of more or equals 95% and 9 had the adherence of less than 95%.

Length of treatment in months

Of the 21 patients who had treatment for more than 6 months to 12 months, 16 had the adherence of more or equals 95% and 5 had the adherence of less than 95%.

Of the 17 patients who had treatment for more than 12 months to 24 months, 14 had the adherence of more or equals 95%, 3 had the adherence of less than 95% and 1 did not respond.

All of the 5 patients who had treatment for more than 24 months to 36 months had the adherence of more or equals 95%.

Of the 7 patients who had treatment for more than 36 months, 6 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

The only patient who did not respond to the length of treatment had the adherence of more or equal 95%.

Number of Pills a day

All the 2 patients who took 3 pills had the adherence of more or equal 95%.

All the 2 patients who took 4 pills had the adherence of more or equal 95%.

Of the 24 patients who took 5 pills, 18 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 20 patients who took 6 pills, 18 had the adherence of more or equals 95% and 2 had the adherence of less than 95%.

Of the 3 patients who took 8 pills, 2 had the adherence of more or equals 95% and 1 had the adherence of less than 95%.

Regimen type

Of the 18 patients who took regimen 1A, 12 had the adherence of more or equals 95% and 6 had the adherence of less than 95%.

Of the 16 patients who took regimen 1B, 13 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

All the 4 patients who took regimen 2 (reviewed) had the adherence of more or equal 95%.

All the 12 patients who took mixed regimen had the adherence of more or equal 95%.

The only patient who took other regimen had the adherence of more or equals 95%.

Type of pills taken by patient

All the 8 patients who took Lamzid had the adherence of more or equal 95%.

Of the 25 patients who took EFV, 19 had the adherence of more or equals 95%, 6 had the adherence of less than 95% and 1 did not respond.

All the 8 patients who took AZT had the adherence of more or equal 95%.

Of the 43 patients who took 3TC, 34 had the adherence of more or equals 95% and 9 had the adherence of less than 95%.

Of the 36 patients who took d4T, 27 had the adherence of more or equals 95% and 9 had the adherence of less than 95%.

Of the 22 patients who took NVP, 19 had the adherence of more or equals 95% and 3 had the adherence of less than 95%.

All the 3 patients who took Alluvia had the adherence of more or equal 95%.

The only patient who took TDF had the adherence of more or equals 95%

4.8 CD4 COUNT ANALYSIS

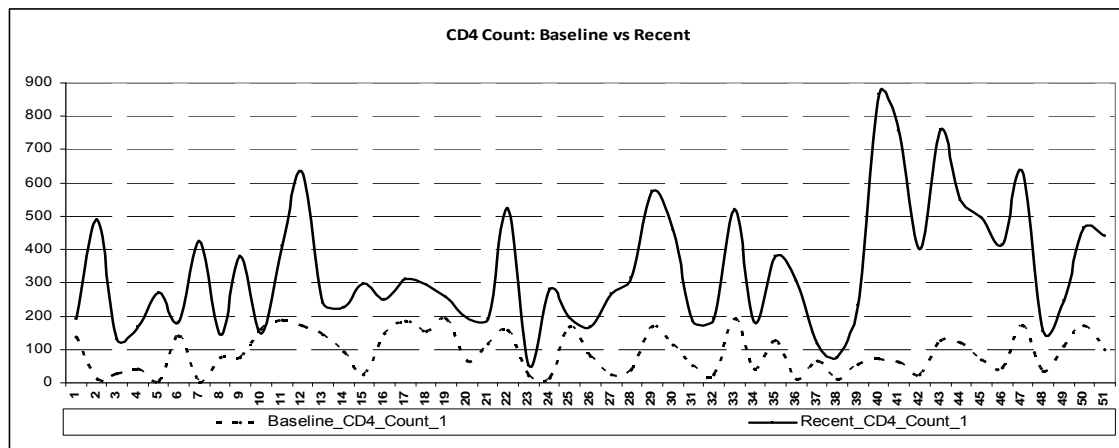
Figure 17. CD4 Count Results

| | > 200 CD4 (Improved immunity and adherence) | < 200 CD4 (risk to opportunistic infections and poor adherence) | No Response |
|---------------------|--|---|-------------|
| Baseline CD 4 count | 0 (0,0%) | 50 (98,0%) | 1 (2, 0%) |
| Recent CD 4 count | 34 (66, 7%) | 17 (33, 3%) | 0 (0, 0%) |

Fifty (98, 0%) patients had the CD4 count of less than 200 before taking the treatment and 1 (2, 0%) did not respond to the question.

After taking the treatment 34 (66, 7%) had the CD4 count of more than 200 and 17 (33, 3%) had the CD4 of less than 200.

Figure 18. Comparison between Baseline and Recent CD4 Count



All patients had the recent CD4 count that was more than the baseline CD4 counts except one. Respondent number 10 had the baseline CD4 count of 161 and the recent CD4 count of 146.

2.6.9 VIRAL LOAD ANALYSIS

Figure 19. VIRAL LOAD (VL) RESULTS (Recent)

| | |
|------------------------------|-------------|
| < 25 RNA Copies /ml | 34 (66, 7%) |
| > 25 and <400 RNA Copies /ml | 11 (21, 6%) |
| 400 to 5000 Copies/ml | 4 (7, 8%) |
| >5000 Copies/ml | 1 (2, 0%) |
| No response | 1 (2, 0%) |

Thirty four (66,7%) patients had a viral load that was below the detectable level (i.e. 25 RNA Copies/ml), 11 (21,6%) had viral load that was below 400 RNA Copies/ml, 1 (2,0%) had viral load that was above 400 RNA Copies/ml but less than 5000 RNA Copies/ml, 4 (7,8%) had viral load that was above 5000 RNA Copies/ml and 1 (2,0%) patient did not respond.

2.6.10 Correlation between Pill Count Method and Visual Analogue Scale (VAS)

Figure 20. Correlation between Pill Count Method and VAS

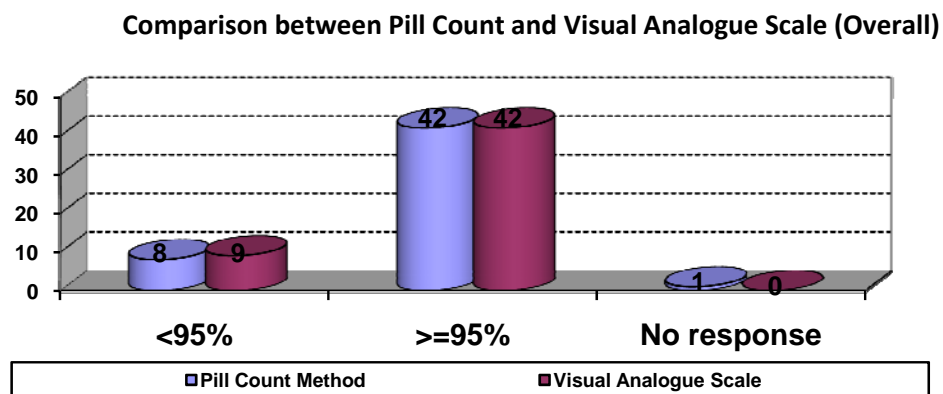
2 Variables: `PILL_COUNT_OVERALL` `VAS_ALL_DRUGS`

| Simple Statistics | | | | | | |
|---------------------------------|----|----------|---------|------|----------|-----------|
| Variable | N | Mean | Std Dev | Sum | Minimum | Maximum |
| <code>PILL_COUNT_OVERALL</code> | 50 | 97.56000 | 5.51865 | 4878 | 70.00000 | 100.00000 |
| <code>VAS_ALL_DRUGS</code> | 51 | 97.64706 | 5.86114 | 4980 | 70.00000 | 100.00000 |

| Pearson Probe Number of Observations | > | Correlation r under | H0: Rho=0 |
|--|---|-----------------------------|----------------------|
| | | PILL_COUNT_OVERALL | VAS_ALL_DRUGS |
| PILL_COUNT_OVERALL | | 1.00000 | 0.83383 |
| PILL_COUNT_OVERALL | | | <.0001 |
| | | 50 | 50 |
| VAS_ALL_DRUGS | | 0.83383 | 1.00000 |
| VAS_ALL_DRUGS | | <.0001 | |
| | | 50 | 51 |

The correlation between pill count method and VAS is 0.83383 which is closer to 1. The two variables are positively related meaning they are almost giving the same results. The p-value (<.0001) shows that there is no significant difference between the two methods. The two measures are almost giving similar results.

Figure 21. Comparison between Pill Count and VAS Adherence



Overall all the patients had the same behaviour on the adherence for Pill Count Method as compared to Visual Analogue Scale.

Forty two patients for both Pill Count and VAS had the adherence of more or equals to 95%, 8 patients had adherence of less than 95% (Pill Count), 9 patients had adherence of less than 95% (VAS) and 1 did not respond for Pill Count.

CHAPTER 5

5. LIMITATION AND RECCOMENDATION CONCLUSION

5.1 LIMITATION OF THE STUDY

The study used one group of participants in measuring if adherence counselling improves adherence to antiretroviral. The study should have given more effective results if two groups of the participants are used in the study with, the control group receiving no adherence counselling and the experimental group receiving adherence counselling. The reason why two groups are not used is that, it is unethical to put patient on antiretroviral without adherence counselling. The three sessions which our participants received prior adherence measure are the standard counselling that Pretoria West Hospital is using.

5.2 RECOMMENDATION.

- Train health care professionals more on HIV/AIDS and adherence counselling
- In-depth training of counsellors on the basic knowledge of HIV/AIDS, drug literacy and adherence counselling
- Use motivational strategies as part of adherence counselling.
- Disseminate information to the patient on their progress or treatment outcomes.
- The ongoing counselling especially by the pharmacist.
- Encourage the involvement of all the multidisciplinary, in assisting the clients to adhere to antiretroviral
- Present and in-service to the staff on the development and new information as far as adherence is concerned.
- Provide educational pamphlets on adherence and HIV/AIDS.
- Encourage the involvement of the support partners as part of enhancing adherence
- Empower the clients who are on antiretroviral, through skills as, assertiveness and self help skills and e.t.c
- Collaborate with the community based organization in promoting adherence to antiretroviral.
- Encourage patient to join support groups, in order to encourage each other to adhere to antiretroviral.
- Improve adherence guidelines that are in use.
- Provide government grants were appropriate to enhance adherence, to assist the clients to meet adherence requirements as dietary requirements.

- Increase the number of counsellors, to attain quality of adherence service.
- Involve the clients in planning for their service.
- Measure adherence on a monthly basis, using at least two measures of adherence
- Conduct more focus group discussion on adherence counselling to see the gaps and find priority for studies.
- Monitor and evaluate the adherence counselling services.
- Design and strengthen the patient follow-up system for defaulters and that patient who are not adhering to antiretroviral.
- Most of all use this study as a guide to improve and design all activities of adherence.
- Conduct case studies to know more on adherence behaviour.
- Review salaries of counsellors to motivate and increase counsellor morale.
- It is recommended that institution take adherence counselling as one of their highest priorities.
- A good relationship between patient and staff is encouraged.

5.3 CONCLUSION

Adherence to antiretroviral improves the lives of those who are on antiretroviral. This goal will not be achieved if people are not adhering to antiretroviral. The health sectors report patient not adhering to antiretroviral or defaulting treatment.

The study proves that adherence counselling improves adherence to antiretroviral. Assessment of the patient, information on HIV/AIDS, drug literacy, adherence strategies, assists the clients to adhere to antiretroviral. Clients adhere to antiretroviral when they know the consequences of non- adherence, as the risk of drug resistance.

Assessment of the patient includes patient variables as the demographic data, and life style of the patient. The knowledge on the patient can help health care provider to know the kind of the regimen suitable for the patient. According to Sir Olser as cited in Fomundam (2008) it is very important to understand what kind of a person the patient is than to understand the kind of the disease the patient have.

It is very important that adherence counsellors, which are all the trained health providers, provide adherence counselling properly in order to enhance adherence to antiretroviral. If patient are not knowledgeable on the information necessary to adhere are more likely to not

adhere to treatment. Non – adherence undermine the efforts of the researchers in conducting studies on antiretroviral.

The goal of adherence can be achieved with the health providers being equipped with the information on adherence. When staff members are equipped they are more confident in managing the patient on antiretroviral. Adherence counselling need to be one of the priorities of institution. When adherence is prioritised people will leave longer on antiretroviral, thus reducing morbidity and mortality.

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7. ANNEXURE

7.1 CONSENT FORM

TOPIC: Proper Adherence Counselling Improves Adherence to Anti-retro viral.

INVESTIGATOR: Chokoe Fridah Lesiba.

The purpose of the study is to investigate if you are adhering to the Anti -retro viral. The study will benefit the patient /clients, as findings will help us improve adherence counselling that is currently in place and reduce burden associated with adherence .The Hospital and the Department of Health will benefits. Knowledge of whether the clients are adhering or not, will help this institutions to design adherence guidelines ,which best enable the clients to adhere to Anti -retro viral, thus reducing the cost related to non –adherence .To my knowledge there is no risk associated with this study.

Anonymity and confidentiality will be ensured .The presentation of findings will not include the identity of the participants. You have the right to refuse or agree to participate; in the study. Your participation in this study is voluntary.

The study has been approved by Pretoria West Hospital, Department of Health and the University of Stellenbosch.

I understand the above information and I voluntarily agree to participate in the study

Signature of the participants..... Date.....

I have explained the study and content of the consent form to the participants

Signature of the Investigator..... Date.....

7.2 APPLICATION LETTER FOR THE PERMISSION TO CONDUCT THE STUDY

PRETORIA WEST HOSPITAL

PRETORIA

8/07/09

P.O. BOX 172

HALFWAYHOUSE

1685

REQUEST FOR CONDUCTING THE STUDY

I am hereby requesting to conduct the study at your Hospital. My topic is Proper Adherence Counselling improves adherence to Antiretrovirals.

I am presently studying Masters in HIV/AIDS management at the University of Stellenbosch.

I hope my request will be taken into consideration.

Kind regards

Chokoe F.L

DEMOGRAPHIC DATA

| | | | | | | | | | | |
|---------------------------------------|-----------------------|-----------|-------------------|---------------------|---------------------|------------|--------------------|---|--|--|
| Age | 15-45 | >45 | | | | | | | | |
| | | | | | | | | | | |
| Gender | M | F | | | | | | | | |
| | | | | | | | | | | |
| Marital Status | Single | Married | Divorced | Cohabiting | Engaged | | | | | |
| | | | | | | | | | | |
| Literacy Level | Never attended school | | Primary Education | | Secondary Education | | Tertiary Education | | | |
| | | | | | | | | | | |
| Employment Status | Unemployed | Pensioner | Government Grant | | Employed | Retrenched | | | | |
| | | | | | | | | | | |
| Residential Area | Township | Suburb | | Informal Settlement | | Other | | | | |
| | | | | | | | | | | |
| Disclosure | Family | | Friends | | Colleague | | | | | |
| | | | | | | | | | | |
| Satisfaction with support from | Health Professionals | | Family | | Friends | | Colleague | | | |
| | | | | | | | | | | |
| Alcohol Consumption | Yes | No | Occasional | | | | | | | |
| | | | | | | | | | | |
| Drug Use | Yes | No | | | | | | | | |
| | | | | | | | | | | |
| Length of treatment in months | | | | | | | | | | |
| | | | | | | | | | | |
| Number of Pills a day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |

PILL COUNT METHODS (This is done for all prescribed tablets)

The formula is as follows:

The Number of Tablets Dispensed -Tablet Returned X 100

Number Prescribed

E. g 60-4 x 100

56

=100 %

1 x.....

=

2 x.....

=

3 x.....

=

Percentage \geq 95 % indicate adherence, percentage below <95 indicate poor adherence and < 70% adherence is unacceptable.

LAST THREE DAYS RECALL METHODS

In the last three days did you take all your tablets as prescribed? Yes / No

N.B Yes indicate 100% adherence and No indicate less than 100% adherence

MORISKY SCALE

In answering the following information think of the medication prescribed by your doctor.

| Response Options Never =0, Rarely=1 Sometimes=2, Often=3, Always=4. | | | | | |
|--|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 |
| Do you ever forget to take your medications? | | | | | |
| Are sometimes careless about taking your medication? | | | | | |
| When you feel better, do you sometimes stop taking your Medications? | | | | | |
| Sometimes, if you feel worse when you take your medication, do you stop taking them? | | | | | |

Adapted from National Resource Centre, 2008

4 of 5

VISUAL ANALOGUE SCALE (VAS)

The purpose of VAS is to assess your adherence level. I would like to know about your condition and how do you take your treatment.

ARV's requires to be taken at different times and has instructions on how to take them, for example with food or empty stomach. Patient on ARV's at times end up forgetting to take their medications because of different reasons, as forgetfulness and side effects.

Therefore the information needed from you is in regards to, how you take your pills the interest is on what is happening not what you think, I want to hear. You must not be afraid to mention, if you did not take your pill.

Mark with an X on the below 10cm line , a point which is your best guess as far as taking medication is concerned in the last four weeks. The drugs are listed from drug A to D.

0% means you have taken none of the drugs

50% means you have taken half of the drugs

100% means you have taken all the drugs

Drug A

1 2 3 4 5 6 7 8 9 10

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Drug B

1 2 3 4 5 6 7 8 9 10

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Drug C

1 2 3 4 5 6 7 8 9 10

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Drug D

1 2 3 4 5 6 7 8 9 10

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

CD4 COUNT RESULTS WILL BE ASSESSED, COMPARED TO BASELINE, > 200

CD4 count indicate improved immunity and adherence and < 200 CD4 count indicate a risk to opportunistic infections and poor adherence

Baseline CD 4 Count..... Recent CD 4 Count.....

VIRAL LOAD (VL) RESULTS WILL BE ASSESSED, COMPARED TO BASELINE, <

1000 VL indicate viral suppression and adherence , and > 1000 VL INDICATE poor suppression of VL and poor adherence

Baseline VL Recent VL.....

7.4 PILL COUNTS CHART

NAME OF TABS ADHERENCE PERCENTAGE

| | | | | | | | | | | |
|--------------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|-------------------------------|
| STAVUDINE 30MG 60 TABS | 100% 4T/R | 96% 6T/R | 93% 8T/R | 89% 10T/R | 86% 12T/R | 82% 14T/R | 80% 16T/R | 75% 18T/R | 71% 20T/R | LESS THAN 70% ≥22T/R |
| LAMIVUDINE 150MG 60 TABS | 100% 4T/R | 96% 6T/R | 93% 8T/R | 89% 10T/R | 86% 12T/R | 82% 14T/R | 80% 16T/R | 75% 18T/R | 71% 20T/R | LESS THAN 70% ≥22T/R |
| EFIVARENZ 200MG 30TABS | 100% 2T/R | 96% 3T/R | 93% 4T/R | 89% 5T/R | 86% 6T/R | 82% 7 T/R | 80% 8T/R | 75% 9T/R | 71% 10 T/R | LESS THAN 70% ≥11T/R |
| NEVIRAPINE 200MG TAB | 100% 4T/R | 96% 6T/R | 93% 8T/R | 89% 10T/R | 86% 12T/R | 82% 14T/R | 80% 16T/R | 75% 18T/R | 71% 20T/R | LESS THAN 70% ≥22T/R |
| ZIDOVUDINE 300MG TABS | 100% 4T/R | 96% 6T/R | 93% 8T/R | 89% 10T/R | 86% 12T/R | 82% 14T/R | 80% 16T/R | 75% 18T/R | 71% 20T/R | LESS THAN 70% ≥22T/R |
| DIDANOSINE 100MG TABS | 100% 36T/R | 96% 39T/R | 93% 42T/R | 89% 45T/R | 86% 48T/R | 82% 51T/R | 80% 54T/R | 75% 57T/R | 71% 60T/R | LESS THAN 70% ≥63T/R |
| DIDANOSINE 100MG TABS | 100% 8T/R | 96% 12T/R | 93% 16T/R | 89% 20T/R | 86% 24T/R | 82% 28T/R | 80% 32T/R | 75% 36T/R | 71% 40T/R | LESS THAN 70% |

| | | | | | | | | | | |
|-----------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|
| | | | | | | | | | | ≥44T/R |
| KALETRA 133/33MG TABS | 100% 12T/R | 96% 18T/R | 93% 24T/R | 89% 30T/R | 86% 36T/R | 82% 48T/R | 80% 54T/R | 75% 60T/R | 71% 66T/R | LESS THAN 70% ≥63T/R |