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HIV Drugs Resistance - A Possible Consequence of Massive Anti-Retroviral Roll Out in Developing Countries - an Urgent Call For Proper Monitoring (Part 1)

ABSTRACT

The case of providing treatment with Highly Active Anti-Retroviral Therapy (HAART) to those who are found to be Human Immunodeficiency Virus (HIV) positive is clear and compelling. But the consequences for not doing it very well might form the most serious public health problem to have ever faced by the developing countries with the advent manifestation of drug resistant strain of the virus. It is estimated that 36.9 million people are presently living with HIV with Sub-Saharan Africa and remains the most heavily affected region by HIV, about 68% of all people living with HIV resided in sub-Saharan Africa in 2010. The World Health Organization report shows that out of the eleven countries surveyed in 2017, six of these countries have over 10% of people starting antiretroviral therapy had a strain of HIV that was resistant to some of the most widely used HIV medication. In addition, HIV drug resistance (HIVDR) to some few selected medications which are well tolerated among children is becoming an increasing concern among health practitioners all over the world, with more children developing treatment resistant strains of the virus as a result of the scale up of prevention of mother-to-child transmission (PMTCT) programmes. For infants exposed to PMTCT programmes, the WHO has also estimated that there is an HIVDR prevalence of 21.6%, compared to just 8.3% among those with no treatment exposure. The introduction of HIV therapy to these large number of people, who are HIV infected, the same way we have approached most of our health programme in the past such as tuberculosis (TB), then we will certainly not accomplished the aim and objectives we wish to accomplished. The fundamental concept of health system quality improvement is that a system that is left unchanged can only be expected to continue producing the same results.

Keywords: HIV Drug Resistant; Anti Retroviral Drugs; Developing Countries; Test and Treat.

BACKGROUND

Statistically from the joint United Nations Programme on HIV and AIDS (UNAIDS) report, it is estimated that 36.9 million people are living with HIV globally, of which 1.8 million of whom were children less than 15 years and 1.7 million people are newly infected with the virus giving an estimate of 5000 new infection per day 2017 [1].

Countries like Swaziland has an estimated of 26.0% the highest HIV prevalence

rate in the world, followed by Botswana (23.4%) and Lesotho (23.3%). With 5.6 million people living with HIV (17.3%) in South Africa home to the world's largest epidemic to mention a few [2].

At 23% prevalence, country like Lesotho is similar to other developing countries has the second highest adult HIV prevalence in the world with a prevalence of 23%. That is approximately 380,000 of the 1.89 million population in the country are infected with HIV virus, including approximately 12,000 children. It is estimated that there are 55,000 annual births in the country, with approximately 15,235 infants born to HIV infected women each year [3].

The WHO surveys of transmitted HIV drug resistance surveyed carried out of the 11 countries surveyed 6 of these countries has over 10% of people starting antiretroviral therapy in these countries had a strain of HIV that was resistant to some of the most widely used HIV medication in those countries.

Therefore the case for providing treatment with Highly Active Anti-Retroviral Therapy (HAART) to those who are found to be HIV positive is clear and compelling. But the consequences for not doing it very well, might form the most serious public health problem to have ever faced by the developing countries with the advent manifestation of HIV drug resistant strain of this virus.

Highly Active Anti-Retroviral Therapy (HAART) also referred to as Standard antiretroviral therapy (ART) consists of the combination of at least three antiretroviral tablet or drugs used to maximally overwhelm the replication power of HIV virus and stop the progression of the HIV disease. As many as 10 million to 10 billion virions (individual viruses) are produced daily in the body of infected individual [5]. The human immunodeficiency virus (HIV) is grouped to the genus Lentivirus within the family of Retroviridae [1]. On the basis of genetic characteristics, HIV is classified into the types 1 and 2 (HIV-1, HIV-2) [4].

Like other retroviruses, HIV attack the body immune system, leading to damage to the immune body system and eventually destroys it by using the DNA of cluster differentiated4 cells (CD4+) cells to replicate itself. In that process, the virus eventually destroys the immune system most especially the CD4+ cells.

Depending on the immune response and the antibody test used,

the commercially available antibody screening tests are able to detect HIV-specific antibodies in the plasma approximately as of the third week post infected state, typically after 4-5 weeks and in the case of a delayed immune response in some infected individual after 8 weeks [5].

Host cells (group of cells making up the human body) infected with HIV have a shortened life span as a result of the virus's using them as "factories" to produce multiple copies of new HIV.

Developing worlds are the moment busyrolling out anti-retroviral (ARV) medication in the public health sector with the *Test and treat (TT) program*?

This universal TT is a strategy in which all HIV infected individuals receive treatment as soon as the test is confirmed. It is aimed at eliminating and serving as a preventive measure by reducing the viral load [6]. Using World Health Organization (WHO) estimates; it is predicted that through the Universal TT programme if properly implemented in all countries will end HIV era within 20 years as a public health concern [7].

The TT mechanism has drastically improved the general life expectancy of many people with head of family are now having full productive lives without fear of dyingearly and leaving behind orphaned children, while HIV positive mothers are now are giving birth to babies who are HIV negative.

The act of providing an effective ARVs treatment with proper monitoring an evaluation for such a large number of people in developing countries is a daunting prospect looking at the present problem encounter withthe inadequate health service infrastructure and supportive services.

The fundamental concept underlying health improvement is that a system that is left unchanged can only be expected to continue producing the same results. To achieve an improved performance, the need to change the system cannot be over emphasis in ways that will enable it produce a quality improved outcome.

Currently in most developing countries, the resources available to primary health care are insufficient to cope with basket of programme and the volume of patients seen at some of the health facilities due to the universal free health care service provided by the government. In order to deliver quality services with an effective monitoring and evaluations of HIV programme, to every nook and corner of the country we need

to do more than we are presently doing at the moment.

The approach presently used in developing countries is termed as public health approach aim at addressing the health needs of the population or the collective health status of the people rather than focusing primarily on individual case management. This is done because this method, ensure the widest possible access to high quality services at the population level due to its inability to effectively manage it for example Nigeria and most of the developing countries. It is high time all developing countries strike a balance between implementing the best-proven standard of care as provided by WHO guideline with evidence base practice (EBP) and what is feasible on a large scale in their environment (resource-limited settings).

It is therefore sad to know that some great intervention or programmes with proven benefit have sometime fail to get pass the pilot state because of the absences of the required infrastructure, poor environmental assessment and the required supports system for the programme. *It is believe that three quarters of computerized information systems (CIS) fail, an example is the electronic medical record (EMR) project costing the tax payers about 134million of Rand in Limpopo Province in South Africa by the International Business Machine (IBM) fail woefully the question is why?* [8].

Outline below are some of the necessary and effective public health programme implementation strategy that is lacking in most developing countries;

- a) The lack of political commitment in the provision of needed resources and support for effective action for the scalability and sustainability of some of this intervention or programmes.
- b) Lack of evidence base intervention and the originality to develop evidence base for action.
- c) Inadequate means of tracking performance through an effective monitoring and evaluation with poor environmental assessment.

But one of the major problems at the present is how to improve the health service infrastructure to ensure adequate delivery of these HIV drugs, to every luck and corner of the country with the proper monitoring and evaluation aspect of these activities. We need to be cautious and do it right. I will repeat it again scaling up the use of anti-retroviral in the public sector with the TT process is a laudable program we must be do it

with the monitoring perspective.

If we are to succeed in this task of effectively delivering HIV treatment to all that needs it in the developing world with monitoring for drug resistant, then it cannot be business as usual.

Our main purpose must not only be to introduce ARV's but we all must all work together to make it work, by addressing some vital issues that are presently undermining our ability to provide an effective primary health care these include:

- a) Inadequate infrastructure and support systems.
- b) Inadequate human resources in most of our facilities.
- c) Underfunding of some of our primary health care programme running in some of our facilities.
- d) Increasing inequity in some of the district health funding.
- e) Improving our lack of preventive mentality activities instead of concentrating mainly on the curative aspect of the curative care.
- f) Improving the quality of care currently existing in most of the key targets set programme and services in all our primary health care.

If all or most of the above mention problems are addressed urgently this may ultimately leads to developing massive HIV drug resistance that will cost the countries more than it will cost to address the above problems. The provision of Anti-retroviral therapy could do more harm than good latter in future in most developing countries where they are presently busy and happy with the progress been made with respect to the provision of HIV drugs to the affected population.

HIV drug-resistance testing is recommended at entry into care for persons with HIV to guide selection of the initial antiretroviral therapy (ART) regimen the question is where the resources are.

In some countries a simple Genotypic or phenotypic test is a problem some of the sample are transported as far as Canada to get the test for the monitoring purposes. *But the same Government can afford to buy million dollars luxurious cars for their own use but with little or no funding for the basic health survival of its citizenry.*

- **Phenotypic** assays measure the ability of a virus to grow in different concentrations of ARV drugs while
- **Genotypic** assays detect drug-resistance mutations in relevant viral genes; in general, these assays require plasma viral load of at least 500 copies/mL to 1,000 copies/mL.

I strongly believe that the introduction of HIV therapy to these large number of people, who are HIV infected, the same way we have approached most of our programme in the past such as tuberculosis (TB), then we will certainly not accomplished the aim and objectives we wish to accomplished. There is a substantial risk that the overall performance of the whole primary care in the management of HIV patients in developing world will be compromised with the development of HIVDR if thing are not done right. The capital question again is how do we strike a balance between implementing the best-proven standard of care provided by the World Health Organization (WHO) through evidence based interventions and what is feasible on a large scale in our settings with our present in fracture and support services.

HIV Drug resistance is an issue that needs urgent and focused attention in developing countries

The main objective of HAART is the suppression of Viral Load, which refers to individual having undetectable HIV virus at the time of retesting 6 months or more after initiating on HAART therapy.

Due to the increase role out HIV medication the development of some HIV drugs resistant (HIVDR) is inevitable in population taking these medications as a result the emergency of HIVDR must be balance against the benefit of providing ART.

HIV drug resistance refers to the ability of the virus to withstand the effects of a given antiretroviral drug to prevent its replication or the ability of HIV to mutate and reproduce itself in the presence of antiretroviral drugs. One most importance of HIVDR is that it can compromise the effectiveness of the limited therapeutic options available in resources limited setting and therefore preventing the countries from attaining the 90% target of viral suppression [9].

The WHO recommendation is that early warning indicators for HIVDR in conjunction with HIV monitoring for drug resistance surveys should be implemented in every national

plan providing antiretroviral therapy the question is that how many countries are doing this? [10]. The data generated during effective monitoring and evaluation will provide informed evidence based decision making regarding the country regimen selection and therefore minimized the emergency of HIVDR at the population level, the question is how effective are the countries doing this?

The WHO HIV DR monitoring survey is design to be integrated easily into a county ongoing routing HIV –related evaluation activities. This was supposed to be performed regularly at representative sites, because the data generated will serves as evidence regarding national and global ART regimen selection and minimized the emergence of HIV drug resistance at the community and population level, and provide information with respect to the following programme indicator on sites.

- How many patients are on the first line?
- How many patients do we have at the facility actively on HAART?
- Proportion Lost to follow up during the first 12 months
- How many patients were virally suppressed at a specific point in time 12 monthly?

The accuracy of some of this s indicator are lacking and if available they are not reflective of the situation on ground, this is simply because this programme are not fully **own or driven** by the country itself but run by Non-Governmental organization.

CONCLUSION

Now it is the critical moment to tackle the issues of HIV/AIDS epidemic, what is required is a comprehensive strategic plan involving all aspect of Health management from the highest level of decision making to the lowest level to radically reorganized the primary health care system, with the provision essential needed human resources, infrastructure and support systems. Any health programme (ARV treatment) that is not within the comprehensive plan of the country health care system, its infra-structure and support services will ultimately increase inequity and will lead to unacceptable overall deterioration in health care system. Implementing an ARV programme with inadequate capacity will also lead to poor treatment adherence, which in turn will lead to the development of HIV drug resistance. It is time to radically

restructure with continuous health system reform in order to strengthen our health care infrastructures to respond to the health need of the population.

REFERENCES

1. UNAIDS/WHO. 'WHO fact sheet on HIV/AIDS'. July 19. 2018. [Google Scholar] [Cited 16th January 2019].
2. Women's E-news, 'In Lesotho and Swaziland, AIDS Activates Women', 24th October 2005. [Google Scholar] [Cited 10th January 2019].
3. Lori Nitschke. (2003). Aid for Girls Going Beyond Schoolhouse [Internet]
4. Government of Lesotho, 'National HIV and AIDS Policy', November 2006, p.28. [Cited 10th January 2019].
5. Branson BM, Owen SM, Wesolowski LG, Bennett B, et al. (2014). Laboratory testing for the diagnosis of HIV infection: updated recommendations. 1-66.
6. Vermeulen M, Coleman C, Mitchel J, Reddy R, et al. (2013). Comparison of human Immunodeficiency virus assays in window phase and elite controller samples: Viral load distribution and implications for transmission risk. *Transfusion*. 53: 2384-2398.
7. Government of Lesotho. National Guidelines for HIV and AIDS care and Treatment. 2010. [Google Scholar] [Cited 15th June 2019].
8. WHO (World Health Organization) and UNAIDS (Joint United Nations Programme on HIV/AIDS). 2003. "Expert Group Stresses That Unsafe Sex Is Primary Mode of HIV Transmission in Africa." Press release, Geneva, March 14.
9. Littlejohns P, Wyatt J and Garvican L. (2003). Evaluating computerised health information systems: Hard Lessons Still to Be Learnt. *BMJ (Clinical research ed)*. 326. 860-3. 10.1136/bmj.326.7394.860 Cited 18th June 2019.[Google Scholar]
10. World Health Organization. HIV DRUG RESISTANCE. [Google Scholar][Cited 15th June 2019].
11. World Health Organization. Antiretroviral therapy of HIV infection in infants and children in resource-limited settings: Towards universal access: recommendations for a public health approach. 2006.

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