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Some New Perspectives and Advances on HIV and AIDS Prevention and Treatment

by Dr. John Chaplin, MB BS

Prevention

There is now a wide array of prevention strategies so it is important to look at the epidemic in your area, both geographical and ministry, and to select the strategies that will be most appropriate and effective. As with treatment it is likely that a combination of strategies will be most effective. However it is also important to look at our partners, especially the church, and select strategies that are acceptable to them and are in line with the Word of God.

Male circumcision has been shown to reduce the chances of being infected with HIV by over 50%.¹ It is less clear how effective it is in preventing women from being infected. One study suggested an increase in HIV infection in women. There have been concerns whether it would encourage men into more risky behaviour because they think they are protected. Some studies have refuted this as with good counselling the men circumcised were in fact, less likely to involve in risky behaviour.² This still leaves the question as to how good the counselling is when male circumcision is being rolled out widely. Certainly if men resume sex before full healing there will be an increase risk.

Voluntary Counselling and Testing (VCT) is not a prevention in itself but encourages people to know their status and with counselling can change people's lifestyle so that they are less likely to become infected. Those who are negative learn how to live so as to stay negative, and those who are positive, learn how to live positively, access treatment and avoid the spread of HIV. Providers (health facilities) are being encouraged to initiate and offer counselling and testing. Some people see good uptake with campaigns and with community health workers visiting and offering testing in people's homes.

Abstinence and delay in sexual debut is effective and studies have shown its impact in countries like Uganda.³ Some studies from the US in particular have failed to show benefits, though there are weaknesses in the studies. The

¹ *Voluntary Male Circumcision for HIV Prevention*. Fact Sheet July 2012 World Health Organisation http://www.who.int/hiv/topics/malecircumcision/fact_sheet/en/index.html

² K.E. Agot, J.N. Kiarie, H.Q. Nguyen, J.O. Odhiambo, T.M. Onyango, N.S. Weiss.

"Male circumcision in Siaya and Bondo Districts, Kenya: prospective cohort study to assess behavioral disinhibition following circumcision." in *Journal of Acquired Immune Deficiency Syndrome*, 2007 Jan 1; Vol. 44 (1): 66-70.

www.ncbi.nlm.nih.gov/pubmed/17019365

³ E.C. Green, A. Herling. *The ABC Approach to Preventing the Sexual Transmission of HIV: Common Questions and Answers*. McLean, VA: Christian Connections for International Health and Medical Service Corporation International, 2006.

<http://www.ccih.org>

perception from the West is that young people do not want this message but there are examples of young people wanting it, embracing it and being effective in doing it in some African countries. There are challenges of transgenerational sex that need to be addressed and have been the topic of publicity and TV coverage.

Studies have shown the most effective strategy has been faithfulness and the reduction of sexual partners, the classic “zero grazing” advocated in Uganda.⁴ This seems to be contraindicated by recent studies that claim the highest number of new infections happens within marriage.⁵ However this shows that there is, or has been, unfaithfulness in marriage to allow HIV infection to come in. Good premarital counselling and testing is important.

When a person is first infected with HIV the amount of virus in the blood rises to very high levels - one study suggests 40% infections occur during this time. The body tries to fight the virus bringing it down to very low levels for years. However it never clears the virus and as it steadily destroys the body's defences the amount of the virus starts to go up in the blood until it is high again. It is at this time that the person develops AIDS. A high level of the virus in the blood (and therefore in the sexual fluids) means HIV can be spread a lot easier. So the times of highest risk of spreading HIV is when the person is first infected and later in the illness when the person becomes less well.

This means if a woman is first infected during pregnancy or breast-feeding there is a much higher risk of the baby being infected with the virus. Hence, it is now being recommended to re-test a pregnant woman a second time near to delivery. It also means if a person is in concurrent sexual relationships (has more than one partner at the same time) and becomes infected he is much more likely to spread it to his other partners as well.

Condoms are effective because of the low transmission rate through sexual intercourse – about 1% unless the person has just been infected and there is a high level of virus or there is a sexually transmitted disease that can increase the vulnerability to HIV infection by up to 10%. However condoms need to be used consistently. Even sex workers who use condoms often don't when with their regular partners. They have not been shown to be effective in a general epidemic but are effective in high-risk groups and in discordant couples where one partner is HIV positive and the other is negative for HIV. Female condoms have similar efficacy but are more expensive, less available and have not been embraced by many.

⁴ See Green and Herling, *The ABC Approach*

⁵ J.R. Glynn, M. Carael, A. Buve, R.M. Musonda, M. Kahindo, of the Study Group on the Heterogeneity of HIVeIAC. “HIV risk in relation to marriage in areas with high prevalence of HIV infection” in *Journal of Acquired Immune Deficiency Syndrome* 2003; Vol. 33: 526–35.

Treating sexually transmitted diseases to reduce the associated increased risk of spread HIV initially showed good results but further studies failed to show significant benefit in reducing overall HIV transmission though it still would be an important thing to do.

Treatment with ARVs (antiretroviral drugs) has been shown to significantly reduce the spread of HIV, maybe up to 96% in one study.⁶ Increasing the number of people on treatment would be an effective strategy of preventing HIV spread. But this is very expensive and presently beyond the capacity of many countries. Furthermore it is not an absolute guarantee of prevention as viral levels in sexual fluids can remain higher longer than in the blood, and another infection, such as malaria, can cause a temporary increase in viral level making the potential of transmission more likely. In the West a person is put on ARVs if in a discordant relationship or pregnant.

There was great excitement with the Tenovir vaginal gel showing up to nearly 50% prevention of HIV transmission if used consistently.⁷ However follow up studies using Tenovir as an oral agent had to be stopped early as it was failing to show any protection from HIV infection.⁸ There is a need for more studies to confirm if vaginal gel does indeed confer some protection as it is something a woman can use without a man's involvement.

One study suggests that Depo-Provera, the contraceptive injection that lasts for 12 weeks, may be associated with an increase in HIV.⁹ It is not clear why and this needs to be investigated, though at present the WHO is still recommending its use.¹⁰ Some progress is being made in researching HIV vaccines, but an effective vaccine still seems a long way off.¹¹

Much has been said about targeting high-risk groups such as Men who have Sex with Men (MSM), Intravenous Drug Users (IDU), and Commercial

⁶ M. Myron, M.S. Cohen et al. "Prevention of HIV-1 Infection with Early Antiretroviral Therapy" in *New England Journal of Medicine*, Aug. 11, 2011; 365 (6): 493-505.

⁷ Q.A. Karim et al, "Effectiveness and Safety of Tenofovir Gel, an Antiretroviral Microbicide, for the Prevention of HIV Infection in Women." *Science*. 2010 Sep 3; 329 (5996): 1168-1174. Published online 19 July 2010, [DOI:10.1126/science.1193748].

⁸ FEM-PrEP Project, "VOICE HIV Prevention Trial Discontinues Tenofovir Gel Arm for Futility (November 25, 2011)." http://fhi.org/en/AboutFHI/Media/Releases/VOICE_discontinues_tenofovir_gel112511.htm. FEM-PrEP Project, "VOICE HIV Prevention Trial Continues, but Researchers Suspend Oral Tenofovir Arm Because of Futility (Sept. 28, 2011)." http://fhi.org/en/AboutFHI/Media/Releases/res_VOICE.htm

⁹ R. Heffron, et al, "Use of hormonal contraceptives and risk of HIV-1 transmission: a prospective cohort study". *The Lancet Infectious Diseases*, Vol. 12.1, Jan. 2012, 19-26.

¹⁰ Department of Reproductive Health, World Health Organization, "Medical eligibility criteria for contraceptive use (2009 edition)". On 15 February 2012 WHO's Guidelines Review Committee upheld the recommendations. <http://www.who.int>

¹¹ Barton F. Haynes, et al, "Immune-Correlates Analysis of an HIV-1 Vaccine Efficacy Trial" in *New England Journal of Medicine*, April 5, 2012, 366: 1275-1286.

Sex Workers (CSW). The reasoning is, if these groups are focused on, then the most impact in HIV spread reduction can be made. However, the Church often is poor at reaching such groups. Is this something the Church should address? Jesus certainly reached out to outcasts: prostitutes, sinners, lepers.

Prevention of Mother to Child Transmission (PMCT)

This is a great opportunity for prevention. Nyeri in Kenya has been reported as reaching 100% coverage.¹² However usually women and their new born child can be lost to follow up at every stage – either they are not tested, or are not coming to get their result (though many are now having a rapid test and will get their result within a few minutes of being tested), not starting on treatment, not coming for delivery, not putting the baby on treatment, or the baby being lost to follow up.

It is best to get the couple tested so that there is support for the necessary treatment by the family, but there can be mixed experiences. Some women have found this helpful and effective, but others have been chased from their homes once they are found to be HIV positive.

There is a move away from using Nevirapine (an ARV) on its own for PMCT. It is 50% effective and there are more effective regimes. It has a long half-life and so stays in the body a long time even after a single dose. This means there is a stronger likelihood of the mother becoming resistant to it. This means in future the mother will not be able to use this or other drugs in this class of ARVs that form the basis for the common, cheap and readily available regimes of treatment of HIV. Fortunately this resistance seems to wane over the course of two years or so.

More commonly now, for PMCT, a combination of ARVs are used, starting during pregnancy and continuing through breast feeding to lower the risk of the virus being spread through breast milk. One effective way would be to put the women on HAART (a full treatment regime for HIV) and leave her on it. It is still recommended to do exclusive breast feeding – i.e. not using other food, cow's milk or formula milk – for four to six months.

The Church should encourage its female members to get tested, especially if pregnant, so as many as possible who are HIV positive can access treatment that can stop the child being infected.

Treatment

The use of ARVs (Antiretroviral drugs) has had a massive impact in Africa. AIDS deaths have decreased and people who were once ill have become well enough to return to work or look after their families, and work in their fields.

¹² Personal conversation with Chair of NACC Kenya, May 2012.

There is a film on U-tube under “Topsy ARVs” which shows a reverse time-lapse video shot over ninety days, “starting” with a lady who looks well, but progressively becoming thinner and frailer until day 1 when she needs support to sit up in bed and take her first dose of ARVs. Consistent use of ARVs can have such an impact in three months. However if treatment is left too late, when the person is too ill, there is a significant number who die even though they are started on ARVs. It is much better to be tested early, before the person becomes really sick, and to start treatment at an earlier stage when their body and immune system are still strong enough to fight off infections.

The WHO has recommended starting treatment at CD4 counts of 350 rather than 200 though many have CD4 counts much lower when first tested. The CD4 count is a measure of the body’s immunity with normal levels usually being between 600 and 1200. Someone who is HIV positive and with a CD4 count below 200 has AIDS by the WHO definition. The challenge, which the church can be involved in, is encouraging people to be tested early, before they are ill, so that treatment can be started at the best time.

AIDS seems to be at a watershed at the moment. Great strides have been made; impact is being seen; but it has been due to a lot of funding. Treatment is for life, so to maintain a person on ARVs costs money and to bring new people onto ARVs costs more. Probably less than a half of those who should be on ARVs are on them. Funding is basically being maintained – flat lining – but to reach more people with ARVs there is a need to increase funds.

Linked with this is the challenge of resistance. If there is too little funding, and not enough ARVs, people might start sharing their medication. Resistance to ARVs is a genuine and common problem if ARVs are not taken at full dose regularly. The worse situation is taking less than the optimal dosage as it allows the virus to replicate in the presence of low levels of ARVs which it gets used to and resistant to. If a person becomes resistant to their ARVs, the virus starts replicating again, their immune system starts deteriorating and they start becoming ill. Changing to different ARVs is then necessary but such second or third line regimes are much more expensive and less readily available. If someone has a virus that has become resistant to ARVs then the virus they infect others with will be the resistant strain. Resistance to ARVs spreads in the community, meaning first line treatment becomes less and less effective.

The church can play a big part in ensuring people take their medication regularly, go to the clinic for their next supply of ARVs, and go if they are unwell or have side effects. A “buddy” system where people befriend those on ARVs, forming a support group for people with HIV can be a means of walking through the illness with those who are infected. This opens up opportunities to share about God, to read His word, and to pray. There are many testimonies of people who have come to know the Lord when they become infected and the church reaches out with God’s love to help them.

Treatment can be a form of HIV prevention. This could mean starting people with HIV on ARVs even earlier, above CD4 counts of 350, but this is very expensive. It may be more appropriate to select certain groups such as discordant couples where one is HIV positive and the other is negative. Putting the positive partner on ARVs would be a way of protecting the negative partner. It is not absolute protection though and certainly with other infections, such as malaria, the HIV viral load will go up briefly and would potentially mean an increase risk of spreading HIV.

With HIV and TB co-infection it is best to start anti-TB treatment first but to start ARVs soon afterward as this seems to have better outcomes and fewer deaths. Stavudine (d4T) was a common part of early ARV regimes but has gone out of favour due to common side effects (nerve and pancreas damage especially) and so is not used in the West and increasingly less so elsewhere.

It is particularly important to start HIV positive children on ARVs because 50% of them will die within two years. CD4 counts are not as helpful in children so it is best to put all HIV positive children on ARVs. The difficulty is making the diagnosis as the normal blood test is an antibody test and the mother's antibodies cross the placenta into the baby's blood. This means a positive test in a baby only means the mother is positive. It can take up to a year for the mother's antibodies to clear from the baby's blood so it can mean waiting a year to see if the child is infected by which time the child can be very ill. The PCR test actually tests for the virus and so can identify HIV positive babies who are six weeks or older. It is much more expensive and less readily available but is particularly useful for this situation. We must carefully follow up children born to HIV positive mothers to check if they have HIV themselves and to start them on ARVs as soon as possible.

In the West AIDS is now being talked about as a chronic illness. Although there is no cure for it, ARVs are so effective that it allows people to live fairly normal lives for many years. It is now being recognised that HIV itself is a persistent inflammatory disease and, as is common with such diseases, it starts to affect multiple organs - heart, kidneys, bones, liver and brain. People with HIV for many years have a higher risk of cardiovascular disease for.¹³ This is making people wonder if starting ARVs even earlier will reduce this inflammation and so reduce such damage and risks in the long term.

There are many new developments in AIDS research. With them come increased opportunities for the church to make an impact in people's lives. The harvest is plenty but the labourers are few – pray to the Lord.

¹³ M. Desvarieux, et al. "Carotid atherosclerosis is related to HIV duration and anti-inflammatory profile and not to ARV exposure: the CHIC controlled study." Eighteenth Conference on Retroviruses and Opportunistic Infections, Boston, abstract 803, 2011. www.retroconference.org/2011/Abstracts/41184.htm