

Circumcision and HIV prevention

NAT Briefing Paper
August 2007

Overview

- There is now clear evidence to show that circumcision can reduce the risk of HIV infection through vaginal intercourse in heterosexual men by up to 60 per cent.
- The WHO and UNAIDS have recommended that circumcision be included as an option in HIV prevention programmes.
- Men undergoing circumcision should be advised of its partial protective benefit and advised that condoms are still necessary and are still the best way of preventing HIV transmission through sexual intercourse.
- More data is needed on the benefit of circumcision to men who have sex with men and on the protective benefit to the female partners of HIV-positive circumcised men.

Evidence of effectiveness of circumcision in HIV prevention

There have been three randomised controlled trials on the effects of circumcision on HIV infection. The first took place near Johannesburg, South Africa¹ and was stopped early in 2005 when the data showed a significant reduction in HIV risk, of 60 per cent, in the circumcised group.

Two other large trials, one in Kisumu, Kenya² and one in Rakai, Uganda³ followed this trial. Both these trials were also stopped early after data showed at least a 53 per cent and 51 per cent reduction in risk respectively.

During the Kenya trial, 22 men in the intervention group and 47 in the control group were diagnosed HIV positive during the trial period, the study recruited 2,784 men, 1,391 were assigned to the circumcision group and 1,393 to the uncircumcised control group. This translates to a 2-year HIV incidence of 2.1 per cent for those circumcised and 4.2 per cent for those uncircumcised, a significant reduction in incidence but one that is still high for the uncircumcised group. Similarly high prevalence amongst both control and circumcision groups was noted in the other studies. This highlights that circumcision alone is not an adequate prevention strategy.

Prior to the three randomised trials, there were a number of ecological and observational studies on the effects of circumcision which suggested a link. An article published in *AIDS* in 2000 conducted a review of the data available at the time for

¹ "Randomized, Controlled Intervention Trial of Male Circumcision for Reduction of HIV Infection Risk: The ANRS 1265 Trial", *PloS Medicine* 2(11) 25 Oct 2005

² 'Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial' *The Lancet* Vol 369, Feb 4 2007

³ 'Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial' *The Lancet* Vo 369, Feb 24 2007

female-to-male transmission in sub-Saharan Africa, and concluded there was a significantly reduced risk of HIV infection amongst circumcised men in the region⁴.

How is circumcision thought to prevent HIV?

Several protective effects of circumcision are suggested. The leading theory is based around circumcision removing one of the main entry points for HIV through the penis. The inner surface of the foreskin contains large numbers of Langerhans cells. Langerhans cells are thought to provide a main entry point in the body, as the virus is able to attach itself to receptors in the cells.⁵

During heterosexual intercourse the foreskin is retracted, exposing this entire inner surface to vaginal fluids and exposing a large area to potential infection. In contrast, the outsides of the foreskin and the penis shaft have a natural barrier that helps to prevent infections, such as HIV, entering the body. The foreskin may also be subject to small tears, which also provide a potential transmission route. With the foreskin removed, as in circumcision, the potential routes of HIV to enter the penis are therefore reduced.

Another benefit is that circumcision is believed to reduce the rates of some sexually transmitted infections and genital ulcers, which are also a risk factor for HIV transmission.

Reactions

Following the publication of the data from the two terminated studies in 2006 many called for circumcision to be included in prevention strategies for HIV. The WHO and UNAIDS now state that "Male circumcision should now be recognised as an efficacious intervention for HIV prevention" and "Promoting male circumcision should be recognised as an additional, important strategy for the prevention of heterosexually acquired HIV infection in men."⁶ Some African countries have introduced circumcision programmes, notably Swaziland who introduced the programme after the first South Africa results came through. The Centres for Disease Control and Prevention in the US has said circumcision may have a role in HIV prevention in the US and is conducting further research to see if it is appropriate.⁷

There has been a strong note of caution in most of the reactions to the trial data. In particular, the WHO and UNAIDS have included several caveats to their recommendation that circumcision be offered as a prevention option. Some of the challenges associated with promoting male circumcision are highlighted in the following section.

⁴ 'Male circumcision and risk of HIV infection in sub-Saharan Africa: a systematic review and meta-analysis' *AIDS* 2000, 14, 2361-2370

⁵ 'How does male circumcision protect against HIV infection?' *BMJ* 2000;320:1592-1594
<http://www.bmj.com/cgi/content/full/320/7249/1592>

⁶ *New data on male circumcision and HIV prevention: policy and programme implications*, UNAIDS, WHO, 28 March 2007
http://www.unaids.org/en/Issues/Prevention_treatment/MC.asp

⁷ *Male circumcision and risk for HIV transmission: implications for the United States*, Centre for Disease Control and Prevention, March 2007
<http://www.cdc.gov/hiv/resources/factsheets/circumcision.htm>

Challenges related to circumcision

Disinhibition

Perhaps the most significant challenge related to promoting circumcision is that it is not 100 per cent effective at preventing HIV transmission. There is a worry that people may misunderstand its protective benefit and become disinhibited around practicing safer sex. This could result in a failure to take additional precautions, such as using condoms or partner reduction, to protect themselves against HIV. If men increase their risk behaviours because they believe that circumcision alone is enough to protect themselves they may counter the effectiveness of circumcision.

In the South Africa trial there was evidence that men in the circumcision group had increased their number of sexual partners. No evidence of an increase in risk behaviour was apparent in the Kenya and Uganda trials, however the rates of HIV acquisition amongst the circumcision group, although lower than the control group, were still high overall despite the effort put into prevention messages, counselling and condom provision.

Transmission routes

There is also a concern about the benefits of male circumcision to female and male partners. The three studies have all focused on protection offered by circumcision in cases of female-to-male transmission and not male-to-female or male-to-male.

The epidemic in Africa, where the trials took place, is overwhelmingly heterosexual and female. There is a fear that male circumcision may counter attempts at female empowerment in HIV prevention, which links to the worries about risk perception outlined previously. If men feel that circumcision is the only protection they need then they may be even more unwilling to use a condom. This would make it harder for women to negotiate condom use and could put them at more risk of acquiring HIV, particularly if risk behaviour around number of partners also increases. There is no clear evidence about the affect circumcision has on male-to-female transmission, where the circumcised man is HIV positive. There is some observational data that suggests there is a benefit, but no large randomised trial has been conducted.

Similarly, there is no clear evidence about the effect circumcision has on transmission through anal sex, for either the insertive or receptive partner. This is naturally an issue for men who have sex with men (MSM), as well as for heterosexual couples who practice anal sex, and may affect whether circumcision is deemed a valuable prevention tool in countries where the epidemic is primarily found in MSM. There is evidence from the US suggesting there was a two-fold increased odds of HIV sero-conversion for those who were not circumcised⁸. But there has not been a large randomised trial to confirm these findings. Currently the Centres for Disease Control in the US is undertaking additional research to determine whether circumcision promotion would be appropriate for the US, and tells individuals that they may wish to consider it as an additional prevention measure. A study in Sydney, Australia, showed no benefit of circumcision for either insertive or receptive partners in anal intercourse⁹.

⁸ *Male circumcision and risk for HIV transmission: implications for the United States*, Centre for Disease Control and Prevention, March 2007
<http://www.cdc.gov/hiv/resources/factsheets/circumcision.htm>

⁹ IAS: Circumcision may be acceptable to some gay men, but study says no value for HIV prevention, www.aidsmap.com/en/news/6F898D49-BF01-4E6E-AFAC-2C3D274D91EB.asp

In order to address all these concerns the following actions should be taken:

- Any promotion of circumcision will need to be accompanied by clear and robust information on its benefits and limitations.
- Men undergoing the procedure will need to understand that it will not provide complete protection from HIV and they will still need to practice other prevention methods, such as condom use, partner reduction, and sexual debut delay.
- There should also be information about the importance of condom use for anal sex, whether this is with a male or female partner.
- Men should be tested for HIV before being circumcised.
- Finally, circumcision should not draw money away from other prevention efforts and should not be seen, as indeed no one prevention option should be, as the sole answer to HIV prevention. A comprehensive approach is needed.

Safety of circumcision

Safety of circumcision is another factor that needs to be taken into account. It is not a risk free procedure and in resource poor settings there may not be the medical staff or facilities to satisfy demand. Circumcision in the trials was done under the best possible medical care and this may not always be possible in the community and could impact on effectiveness. If facilities are not of a high enough standard there is the potential risk of HIV transmission occurring through cross contamination of equipment. There is also the possibility of complications such as bacterial infection caused by unsterile conditions or medical complications caused by inadequately trained staff.

Linked to this are discussions of using traditional methods of circumcision and if these can or should be accommodated into circumcision roll out. In some areas where circumcision has been traditionally practiced there have been concerns about the traditional methods of circumcising being unsafe. Indeed in South Africa circumcision of boys under 16 (except for medical reasons) has been banned to protect boys from unsafe practices. While not all traditional methods will be unsafe attention needs to be paid to ensure circumcision is done in a safe way to avoid transmitting blood borne viruses, damage to the penis, or infection.

Culture and religion

The practice of infant circumcision and the cultural meanings attached to it has also attracted controversy. In some cultures boys will be circumcised whilst still babies, others wait until the boy enters puberty, and others do not circumcise at all. Infant circumcision has been criticised as a 'mutilation' of boys without their consent and is seen by some critics to have no medical reason in most cases. Circumcision does reduce sexual feeling so it is not a neutral operation and this needs to be remembered.

In many ways routinely circumcising infants or prepubescent boys would provide better protection from HIV, as they would not yet have embarked upon the sexual contact that may expose them to HIV. However ethical questions arise over whether it is acceptable to circumcise an infant to protect against a sexually transmitted infection that they may not acquire or can protect against in other ways. Circumcision of teenage boys also raises similar concerns over their ability to consent when it is seen as a cultural right of passage or a religious duty.

Conclusions

The results from the three randomised trials make it clear that circumcision is an effective tool for reducing HIV transmission and the WHO and UNAIDS now recommend it is included as part of the prevention toolkit.

However, circumcision is not without its challenges. There are concerns over the way circumcision might be practiced and whether experienced people will do it in appropriate settings in a safe manner. There are also cultural and religious issues to consider, and the ethics of circumcising infants who cannot concede to the procedure. These issues are probably best addressed by the countries rolling out circumcision programmes.

Importantly circumcision should not be seen as a prevention tool for everyone, currently the only clear protection is for female-to-male transmission. It may provide some protection for women having sex with a HIV positive male partner, and for MSM, but there have been no randomised trials to prove this.

It should not be seen as a 'magic bullet' or sole method of HIV prevention, as although it reduces risk by up to 60 per cent it does not eliminate it completely. If men increase their risk behaviour in the belief that circumcision has protected them they may negate the beneficial effects of circumcision. Thus it should always be seen as a companion tool to be used alongside condoms, partner reduction, sexual debut delay, and other tools. Because of this, circumcision should not be provided at the expense of other prevention options, particularly as the benefit for women is not clear. It should be stressed that condoms remain the most effective current prevention tool and nothing in circumcision advocacy should compromise or dilute the message that consistent condom use remains vital.

National AIDS Trust, August 2007

Bibliography

Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, et al. 'Randomized, Controlled Intervention Trial of Male Circumcision for Reduction of HIV Infection Risk: The ANRS 1265 Trial', *PloS Medicine* 2(11) 25 Oct 2005

Bailey RC, Moses S, Parker CB, Agot K, et al 'Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial' *The Lancet* Vol 369, Feb 4 2007

Gray RH, Kigozi G, Serwadda D, et al 'Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial' *The Lancet* Vol 369, Feb 24 2007

Szabo, R and Short, V,R, 'How does male circumcision protect against HIV infection?' *BMJ* 2000;320:1592-1594
<http://www.bmj.com/cgi/content/full/320/7249/1592>

Weiss, Helen A.; Quigley, Maria A.; Hayes, Richard J , 'Male circumcision and risk of HIV infection in sub-Saharan Africa: a systematic review and meta-analysis' *AIDS* 2000, 14, 2361-2370

Circumcision may be acceptable to some gay men, but study says no value for HIV prevention

www.aidsmap.com/en/news/6F898D49-BF01-4E6E-AFAC-2C3D274D91EB.asp

New data on male circumcision and HIV prevention: policy and programme implications, UNAIDS, WHO, 28 March 2007

http://www.unaids.org/en/Issues/Prevention_treatment/MC.asp

Male circumcision and risk for HIV transmission: implications for the United States, Centre for Disease Control and Prevention, March 2007

<http://www.cdc.gov/hiv/resources/factsheets/circumcision.htm>