DEBATE Voluntary male medical circumcision

Matthew Kesinger, Peter S Millard

The thoughtful editorial by Professor Ncayiyana concerning the national circumcision programme in South Africa¹ rests on two central arguments: first, that the scientific evidence is insufficient to justify such 'serious energy, money and resources', particularly when circumcision programmes have the potential of diverting money from other more effective interventions; and second, that risk compensation (the potential increase in risky behaviour after circumcision) may nullify any benefits of circumcision.

The scientific evidence

There are few medical or public health interventions that are based upon evidence as strong and consistent as that for the effectiveness of male circumcision in preventing female-to-male transmission of HIV. Ncaviyana reviews the cumulative evidence from early observational studies, and from the three landmark randomised controlled trials in Africa. He notes that the studies were stopped early. However, they were not stopped early by investigators; individual studies were stopped by their independent Data and Safety Monitoring Board because the evidence was strong enough to deem unethical the withholding of circumcision from the control group. All men were then offered circumcision and, as Ncayiyana points out, an opportunity for direct long-term follow-up was lost. However, not all was lost. Observational research continues to strengthen the experimental findings. For example, a community-based survey of the Orange Farm community was recently presented, which showed an increase in circumcision coverage from 15.6% in 2007 to 49.4% in 2010, with a concomitant HIV seroprevalence of 20% among uncircumcised men and 6.2% among circumcised men, and no correlation between circumcision status and sexual behaviour.²

Risk compensation – does it exist?

Ncayiyana argues that circumcision may increase risk compensation and therefore increase HIV transmission. The Orange Farm trial did indeed find a slight increase in risky behaviour in the circumcised men, but, in spite of this, there was a still 60% reduction in HIV transmission.³ On the other hand, the Uganda trial 'did not find evidence that men in the intervention group adopted higher sexual risk behaviours than those in the control group. This could have been due to the intensive health education provided during the trial to minimise risk compensation.²⁴

The Kenyan trial found that 'the differences (of risk behaviour) between the two groups are attributable to increases in safer sexual practices in the control group rather than to riskier behaviour

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patterns in the circumcision group, indicating that risk compensation did not occur during the 24 months of this study.⁵ In fact, condom use went up in both groups and unprotected sex went down in both. This is probably a function of intensive counselling. Further studies in the Kenyan cohort and community show that risk compensation is not a necessary consequence and that circumcision can be used as an opportunity to educate men about HIV prevention.⁶⁻⁸

Most importantly in relation to South Africa, Ncayiyana cites a survey by Bridges *et al.* claiming that this study links demand for circumcision with the idea that a circumcised man no longer needs to use a condom.⁹ But the results of this study are: 'Johannesburg, South Africa, shows that demand for circumcision is largely determined by the perceived benefits of reduced HIV/STI transmission risk, better hygiene and better sex ... [O]ur analysis shows that – in the aggregate – condom avoidance is not perceived as a benefit of circumcision. Our findings suggest that moral hazard concerns related to risk compensation via condom avoidance associated with male circumcision are exaggerated.²⁹

Cost and impact of circumcision

Finally, Ncayiyana compares the HIV epidemic in South Africa with Australia and the USA, stating that Australia does not recommend universal circumcision, and that it therefore is not right for South Africa. There are very different drivers for the HIV epidemic in South Africa versus Australia, and comparing them is unwise. In Australia, for example, 100 cases of heterosexually transmitted HIV are diagnosed annually.¹⁰ On the other hand, in South Africa about 1 400 new HIV infections occur per day, almost all via heterosexual transmission.¹¹ And despite the relatively high rate of heterosexual transmission (31%) in the USA, the seroprevalence rate is 0.4% and the major route of transmission is men who have sex with men,¹² which is certainly not the case in South Africa.

The high heterosexual transmission rate in South Africa means that the number of men who must be circumcised to prevent one HIV infection is much lower than in the USA or Australia. UNAIDS and the World Health Organization (WHO), using South African data and heterosexual transmission models, estimate that one new HIV infection can be avoided for every 5 to 15 circumcisions.¹³ And this estimate takes into account possible risk compensation across the entire population.

Large-scale circumcision will consume resources, energy and time, but, as Hillary Clinton said, 'we all must step up our use of combination prevention'.¹⁴ Because the impact of circumcision is so much greater in South Africa, scaling up circumcision is much more cost-effective compared with other countries. The cost savings in HIV prevention in high-prevalence areas is estimated at between US\$150 and nearly \$900 per infection prevented over a 10-year time horizon.¹³ If 1 000 adult males were circumcised in South Africa's Gauteng province alone, \$2.4 million could potentially be saved in HIV treatments over 20 years.¹⁵ The money saved on treatment could be reinvested in testing, treatment, and prevention of vertical transmission – other methods of prevention that Ncayiyana points out have a proven impact.

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Forum

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