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MaleCircumcision and HIV prevention in Southern Africa:Questioning WHO recommendations

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Abstract

The relationship between HIV infection and male circumcision, medical or traditional, remains controversial. Randomized controlled trials indicate that medical circumcision reduces HIV incidence in the months following the surgery. But demographic studies show that HIV prevalence is the same in the long run whatever the circumcision status. This communication summarizes the results of large scale demographic surveys carried out in southern African countries, the area of the world the most affected by HIV/AIDS. These surveys show that HIV prevalence among men aged 40-59 is the same regardless of circumcision status(circumcised vs intact) and type of circumcision (medical vs traditional). These results challenge WHO's recommendations.

Keywords: HIV/AIDS; Circumcision; Southern Africa; Demographic surveys

Introduction

HIV (Human Immunodeficiency Virus), the virus causing AIDS, ravaged African populations in the 1980s and 1990s. Although the situation stabilized in most countries after 2005, HIV is still present and AIDS remains a significant cause of death among young adults and continues to destroy and ruin families, especially in southern Africa.

Several strategies for preventing and combating HIV/AIDS have been developed over the years.Firstly, the blood bank was secured, to avoid transmission by blood transfusion.Secondly, condom use was promoted, which worked well in most countries, as well as abstinence from risky behavior (ABC strategies).Then, prevention of mother to child transmission was put in place.The advent of antiretroviral treatments made it possible not only to considerably reduce mortality, but also to limit transmission by reducing the viral load.These major health programs were crowned with success: they enable to stop the progression of the epidemic, to reduce incidence and to reduce mortality.They also had numerous social consequences, particularly on the stability of couples and family structures, and helped reducing the number of orphans.

In 2007, the World Health Organization (WHO) published a controversial new recommendation: promoting male circumcision to reduce HIV transmission [1]. This strategy was based on three randomized clinical trials carried out in South Africa, Kenya and Uganda, all of which showed that circumcision reduced HIV incidence by around 50% in the 18 to 24 months following the operation. The rational is simple: the foreskin contains certain target cells for HIV (Langerhans cells), and therefore removing these cells could permit avoidinga number of transmissions. But the glans and the urethra also contain target cells, and therefore circumcision cannot protect people at risk in the long run. Knowing that in southern Africa HIV prevalence in the general population is very high (20% to 40% depending on the country), men are intensely exposed to the risk of contracting the infection. The majority of men in these countries were not circumcised before 2007, and the majority of those circumcised were circumcised as part of ancestral customs by non-medically trained operators. Since 2008, the majority of circumcisions have been carried out by medical personnel (nurses and doctors), and some 22 million young men have been circumcised as part of VMMC (Voluntary Medical Male Circumcision) programs. But are these programs beneficial for the populations? Does circumcision have an impact on prevalence in the general population? Analysis of demographic data available in the countries of southern Africa, the most affected in the world by HIV/AIDS, shows the opposite. This article summarizes the results of these investigations.

Demographic evidence

Large scale demographic surveys conducted in southern African countries enable one to compare the level of HIV infection (HIV prevalence) according to circumcision status. Several large scale survey programs were conducted since 1999: the DHS (Demographic and Health Surveys) program, the PHIA (Population-based HIV Impact Assessment) program,

and the HSRC (Human Science Research Council) program [2-4]. All these surveys were based on representative samples of the adult population, and contain information on seroprevalence (HIV infection), tested by blood sampling, and on circumcision (medical or traditional). They therefore enable one to compare HIV infection (positive vs negative) according to circumcision status (circumcised vs intact) and according to type of circumcision (medical vs traditional).

For this study, eight southern African countries were selected: South Africa, Eswatini (formerly Swaziland), Lesotho, Malawi, Mozambique, Namibia, Zambia and Zimbabwe. Men aged 40-59 were selected because they are the most affected by HIV/AIDS and were exposed to the virus for a long time. Indeed, HIV prevalence is very low before the age of 20, that is to say before the first sexual intercourse, then it increases rapidly with age, and peaks around the age of 50. Most infections occur between the ages of 20 and 40, at the ages when risky sexual relationships are most frequent.

Results

The eight southern African countries were differently covered by demographic survey programs (Table 1).The DHS program covered 7 countries, the PHIA program covered 6 countries, and the HSRC program concerned South Africa only (4 surveys).In each survey the number of cases was generally too small to draw firm conclusions, and most differences were not statistically significant.However, aggregating the data showed that among men aged 40-59 HIV seroprevalence was practically the same regardless of circumcision status and type of circumcision (Table 1, Figure 1).For instance, in the PHIA surveys HIV prevalence was 27.3% among circumcised men and 27.2% among intact men, with no difference between medical and traditional circumcision (26.2% and 28.1% respectively).In the DHS surveys there was a small difference in prevalence (21.2% vs 18.0%), which came from surveys in two countries: South Africa and Mozambique.This difference could be easily explained by selection bias, as was clearly demonstrated in the case of Zambia and Lesotho [5-6].Indeed, medical circumcision campaigns targeted more educated and more urbanized men, who were less likely to be infected.In the case of DHS surveys, no difference was observed between medical and traditional circumcision.The South African HSRC surveys showed no difference in prevalence (15.2% and 15.7%) according to circumcision status, however they showed a small difference between medical and traditional circumcision, again due to selection bias.The absence of difference according to circumcision status was already noted in the first survey conducted in South Africa in 2002 [7-8], as well as in the first DHS surveys conducted in other African countries [9-11].

Conclusions

Proof of the effectiveness, and even the usefulness, of a public health campaign necessarily comes from the study of its demographic impact, that is to say its effect in the general population.This is called “phase 4” of clinical studies.These phase 4 studies may lead

to conclusions different from those drawn from phase 3 studies, which are conducted on small randomized samples, and focused on a targeted response variable.This is the case here: a reduction in short-term incidence does not translate into a difference in long-term prevalence.This result could have been expected if one takes into account the strong heterogeneity in sexual behaviors.Indeed, when men are not exposed (in a stable couple for example), circumcision has no effect.When men are exposed intensively and repeatedly (many infected partners) circumcision will have no impact because circumcised or intact they will end up becoming infected.These results were known already in 2007, and the WHO recommendation therefore appears surprising [7,9,10,12].Fortunately, many men in these countries have been careful enough not to follow this recommendation.And those who continued to use condoms in the event of risky sex remained unscathed.

The large circumcision campaigns currently underway in Africa, targeting adolescents and young men, also pose numerous ethical problems [13-15].More generally, all forms of genital mutilation must be called into question, and particularly excision among young girls [16].

The health systems of African countries are already strained by numerous diseases, infectious or other, endemic or emerging (such as the recent Covid-19), and health personnel remains very insufficient for a large population which, moreover, grows at high speed [17].Was it wise to mobilize significant human and material resources to carry out unnecessary, or sometimes even dangerous, surgical operations?

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Table 1: HIV prevalence according to status and type of circumcision among men aged 40-59. Results of demographic surveys in Southern Africa.

Survey program		Men age 40-59		HIV prevalence, by status and type			
				Circumcision status		Type of circumcision	
Country	Year	% circum-cized	% HIV+	Intact	Circum-cized	Medical	Traditional
PHIA (N= 10172)		28.3%	27.2%	27.3%	27.2%	26.2%	28.1%
Eswatini	2017	18.8%	44.7%	46.5%	37.1%	37.5%	35.7%
Lesotho	2016	67.1%	41.7%	40.1%	42.4%	36.9%	44.7%
Malawi	2015	23.0%	21.0%	19.5%	26.0%	32.1%	23.8%
Namibia	2017	36.2%	20.7%	23.0%	16.7%	17.9%	15.6%
Zambia	2016	22.9%	21.0%	22.6%	15.5%	18.6%	11.5%
Zimbabwe	2015	11.3%	28.4%	29.1%	22.7%	21.6%	25.6%
HSRC (N= 5998)		43.7%	15.4%	15.2%	15.7%	11.4%	18.7%
South-Africa	2002	38.2%	11.2%	10.8%	11.9%	4.3%	15.8%
	2008	42.1%	10.0%	9.5%	10.7%	5.4%	15.1%
	2012	41.7%	12.0%	11.7%	12.4%	7.6%	15.4%
	2017	48.7%	23.5%	24.8%	22.1%	19.0%	24.8%
DHS (N= 8721)		32.6%	20.2%	21.2%	18.0%	17.5%	18.3%
Lesotho	2014	72.9%	34.0%	39.8%	31.8%	28.0%	32.9%
Malawi	2016	26.0%	17.5%	17.6%	17.2%	21.4%	16.5%
Mozambique	2015	62.5%	13.4%	18.4%	10.3%	12.2%	9.5%
Namibia	2013	31.1%	20.6%	22.1%	17.3%	20.5%	13.0%
South-Africa	2016	48.5%	23.8%	29.6%	17.8%	10.3%	21.9%
Zambia	2018	21.8%	17.2%	17.2%	17.3%	17.3%	17.6%
Zimbabwe	2015	11.9%	26.2%	26.7%	22.2%	20.1%	26.1%

NB. Small differences by status or type are either not statistically significant or due to selection bias. N= pooled sample size, all national samples representative of the general population.

Figure 1: HIV prevalence by circumcision status among men aged 40-59 in large scale demographic surveys conducted in southern African countries.