Published in final edited form as:

J Acquir Immune Defic Syndr. 2009 April 1; 50(4): 435–437. doi:10.1097/QAI.0b013e3181958591.

Association Between Male Circumcision and Prevalent HIV Infections in Rio de Janeiro, Brazil

André R. S. Périssé, MD, MSc, PhD^{*,†}, Mauro Schechter, MD, PhD^{‡,§}, and William Blattner, MD^{*}

^{*} Institute of Human Virology, University of Maryland, Baltimore, MD

[†] Departamento de Ciências Biológicas, Escola Nacional de Saúde Pública, Fiocruz, Rio de Janeiro, Brazil

[‡] Projeto Praça Onze, Hospital Escola São Francisco de Assis, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

[§] Department of Preventive Medicine, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

To the Editor:

Circumcision has been recommended by the World Health Organization as a measure to prevent HIV infection in hyperendemic countries with low prevalence of male circumcision in which the main route of infection is heterosexual relationship.¹ Brazil has been widely praised for being the first developing country to provide free and universal access to antiretroviral therapy and for its direct and frank approach to prevention of HIV/AIDS transmission. Nonetheless, there have been limited discussions on the possible role of male circumcision as preventive measure in the Brazilian context.^{2,3} Herein, we present data on the prevalence of male circumcision and HIV infection in a HIV voluntary counseling and testing (VCT) site in Rio de Janeiro, Brazil.

The current data are part of a cross-sectional survey employing egocentric network-based risk behavior assessment conducted between June 2005 and July 2006 at the VCT site located at the Hospital Escola São Francisco, Universidade Federal do Rio de Janeiro. The VCT site tests approximately 5000 individuals every year, of which roughly half are women and about 10% are men who have sex with men (MSM). The main reported reasons for seeking testing are concern about a possible exposure (56%) and prenatal care (12%). The most frequently reported risk exposure is a sexual relationship (90%), and about 85% of the VCT clients report fewer than 4 partners in the previous year. Overall prevalence of HIV infection is 8% with differing rates by risk category.^{4,5}

Study volunteers were selected from a convenience sample of individuals attending the VCT site for the first time and presumably not aware of their HIV status. Exclusion criteria included age younger than 18 years, previous knowledge of HIV seropositivity, lack of a history of sexual relationships in the previous year, pregnancy, and individuals with clinical AIDS as defined by the Caracas criteria.⁶ All eligible volunteers signed informed consent before screening and answering a questionnaire that collected information on demographic variables, socioeconomic level, and behavior. We evaluated the possible associations with serostatus by using 2-sample independent t tests for continuous variables and x2 test or Fisher exact test in the case of categorical variables. All variables with P value <0.15 in the exploratory analysis, and any other biologically plausible variables, were used to fit a logistic regression model in which HIV serostatus was used as the dependent variable. An interaction term to explore the association between HIV and circumcision status by sexual orientation (MSM vs. heterosexual) was also tested in our final model. SAS (V. 9.1; SAS Institute, Inc, Cary, NC; 2002–2003) was

used to analyze the data. The study protocol was approved by the Institutional Review Boards of the University of Maryland, Baltimore, MD, and of the Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

During the 13-month study period, 1290 volunteers were approached for inclusion. Forty individuals (3.1%) were not eligible for the study for various reasons. Of the remaining 1250 individuals, 19 (1.5%) were excluded primarily because of refusal to give blood ($n = 13/19$; 68%). Most of the 799 male volunteers who were included were younger than 30 years ($n = 433$, 54%), mulatto ($n = 355$, 44%), and single ($n = 399$, 50%). About 75% of the participants defined themselves as heterosexuals ($n = 601$) and reported a median of 3 sex partners in the past year (range, 1–700). Although only 3 of 102 circumcised volunteers (3%) were HIV positive, a total of 68 of 697 uncircumcised volunteers were HIV positive (10%). Race, marital status, educational level, socioeconomic status, religion, and sexual orientation were not associated with the chance of being circumcised. There was no association between circumcision status and reported risk behaviors. Circumcised participants had a higher probability of being older than 30 years of age [odds ratio (OR): 2.42; confidence interval (CI): 1.6 to 3.7] and a lower probability of being HIV positive (OR: 0.28; CI: 0.1 to 0.8). In the final multivariate model, HIV-positive individuals were less likely to be circumcised (OR: 0.3; CI: 0.09 to 0.9) and were older [highest probability for participants between 40 and 50 years of age (OR: 2.7; CI: 1.3 to 5.8)], of lower socioeconomic status (lower probability for individuals with monthly family income of R\$466; OR: 0.4; CI: 0.2 to 0.9), more likely to define their sexual orientation as male homosexual or bisexual (OR: 8.9; CI: 5.1 to 15.9), and less likely to have used drugs in the previous year (OR: 0.4; CI: 0.2 to 0.9) (Table 1). The interaction term was not statistically significant ($P = 0.84$) and was not kept in the final model.

Little is known about the prevalence of circumcision in Brazil.^{2,3} Walter et al⁷ reported a frequency of more than 90% of noncircumcised individuals in their study in 3 small cities near Rio de Janeiro, Brazil, a result that is similar to ours. Our cross-sectional study was not designed to investigate the role of circumcision in HIV transmission, and information on age and reasons for circumcision were not obtained. Although the study design does not allow us to determine when circumcision was performed, it most likely occurred before awareness of HIV seropositivity because participants were presumably unaware of their serostatus upon inclusion. Another possible limitation of our study is that we used self-report as a measure of circumcision status. Nonetheless, various studies have shown excellent agreement with clinical examinations in different settings, reaching almost 100% in some cases.^{8–10} However, if self-reporting resulted in misclassification of circumcision status, the strength of the protective effect of male circumcision would be underestimated in our study.

Based on unequivocal data from 3 clinical trials in Africa that showed the efficacy of male circumcision to reduce female-to-male transmission of HIV,^{11–13} the World Health Organization now recommends male circumcision in areas with specific epidemiologic characteristics. In 2007, the Brazil National AIDS Program released a statement contrary to the adoption of circumcision as part of the recommended measures to prevent HIV infection in Brazil.¹⁴ Their main concern was the absence of data on the efficacy of male circumcision to prevent transmission between MSM and its impact on sexual behavior.

Our data indicate that circumcised men attending a VCT site in Rio de Janeiro, Brazil, had a significantly reduced probability of being HIV positive when compared with uncircumcised men, controlled for several covariables. The final adjusted odds ratio found in our study of high-risk men is similar to the one found by Weiss et al¹⁵ in their meta-analysis of observational studies of high-risk men in Africa. Although not generalizable to the Brazilian context and not modified by sexual orientation, this finding may contribute to the debate about the need to conduct studies on the role of male circumcision to prevent HIV infection in Brazil.

References

1. WHO/UNAIDS. New data on male circumcision and HIV prevention: policy and programme implications. 2008 [Accessed August 22, 2008.]. Available at: http://data.unaids.org/pub/Report/2007/mc_recommendations_en.pdf
2. de Castilho EA, Guimaraes MD. Male circumcision and HIV infection: an international debate with no Brazilian participation [in Portuguese]. *Rev Soc Bras Med Trop* 2004;37:51–52. [PubMed: 15042184]
3. Eyer-Silva WA. Male circumcision and HIV heterosexual transmission [in Portuguese]. *Rev Saude Publica* 2003;37:678–686. [PubMed: 14569349]
4. Barroso PF, Harrison LH, de Fatima Melo M, et al. Identification of a high-risk heterosexual cohort for HIV vaccine efficacy trials in Rio de Janeiro, Brazil, using a sensitive/less-sensitive assay: an update. *J Acquir Immune Defic Syndr* 2004;36:880–881. [PubMed: 15213576]
5. Cook RL, May S, Harrison LH, et al. High prevalence of sexually transmitted diseases in young women seeking HIV testing in Rio de Janeiro, Brazil. *Sex Transm Dis* 2004;31:67–72. [PubMed: 14695962]
6. Weniger BG, Quinhoe EP, Sereno AB, et al. A simplified surveillance case definition of AIDS derived from empirical clinical data. The Clinical AIDS Study Group, and the Working Group on AIDS case definition. *J Acquir Immune Defic Syndr* 1992;5:1212–1223. [PubMed: 1453332]
7. Eyer-Silva WA, Freire MA, Gayao ML, et al. Epidemiologic features of HIV infection in three municipalities of inner Rio de Janeiro State, Brazil. *Rev Inst Med Trop Sao Paulo* 2007;49:303–307. [PubMed: 18026637]
8. Lavreys L, Rakwar JP, Thompson ML, et al. Effect of circumcision on incidence of human immunodeficiency virus type 1 and other sexually transmitted diseases: a prospective cohort study of trucking company employees in Kenya. *J Infect Dis* 1999;180:330–336. [PubMed: 10395846]
9. Risser JM, Risser WL, Eissa MA, et al. Self-assessment of circumcision status by adolescents. *Am J Epidemiol* 2004;159:1095–1097. [PubMed: 15155294]
10. Urassa M, Todd J, Boerma JT, et al. Male circumcision and susceptibility to HIV infection among men in Tanzania. *AIDS* 1997;11:73–80.
11. Auvert B, Taljaard D, Lagarde E, et al. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 Trial. *PLoS Med* 2005;2:e298. [PubMed: 16231970]
12. Bailey RC, Moses S, Parker CB, et al. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial. *Lancet* 2007;369:643–656. [PubMed: 17321310]
13. Gray RH, Kigozi G, Serwadda D, et al. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet* 2007;369:657–666. [PubMed: 17321311]
14. Lôbo, I. Brasil não deve adotar circuncisão como política de combate à aids. 2007 [Accessed August 22, 2008.]. Available at: <http://www.agenciabrasil.gov.br/noticias/2007/04/02/materia.2007-04-02.8775465930/view>
15. Weiss HA, Quigley MA, Hayes RJ. Male circumcision and risk of HIV infection in sub-Saharan Africa: a systematic review and meta-analysis. *AIDS* 2000;14:2361–2370. [PubMed: 11089625]

TABLE 1

Logistic Regression Analysis of Risk Factors for HIV Infection (n = 799)

Characteristic	Odds Ratio Estimate	95% CI
Age in years		
<30	1.0 (reference)	—
30–40	1.9	1.0 to 3.5
40–50	2.7	1.3 to 5.8
≥50	2.1	0.6 to 7.8
SES (R\$) *		
≤240.00 (reference)	1.00	—
240.00–466.67	0.8	0.4
>466.67	0.4	0.2
Sexual identification		
Heterosexual (reference)	1.00	—
MSM	8.9	5.1 to 15.9
Circumcision		
Yes	0.3	0.09 to 0.9
No (reference)	1.0	—
Use of any drug		
Yes	0.4	0.2 to 0.9
No (reference)	1.00	—

SES, socioeconomic status.

* One US \$≈2R\$; categories in tertiles.