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Does Sex in the Early Period After Circumcision Increase HIV-Seroconversion Risk? Pooled Analysis of Adult Male Circumcision Clinical Trials

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Abstract

Objective—To evaluate whether sexual intercourse soon after adult male circumcision affected HIV risk.

Design—Combined analysis of data from African trials of men who were randomized to and underwent circumcision.

Methods—We examined two associations: (1) early sex (intercourse <42 days after circumcision) and HIV acquisition at 3 months for the Orange Farm and Kisumu trials, and at 6 months for the Rakai and Kisumu trials; and (2) incomplete wound healing at 1 month and seroconversion at 3 and 6 months for the Kisumu trial and at 6 months for the Rakai trial.

Results—Early sex was reported by 3.9% of participants in Kisumu, 5.4% in Rakai, and 22.5% in Orange Farm. HIV-seroprevalence was 0.0% at 3 months and 1.9% at 6 months among 18–24 year-olds reporting early sex; and 0.2% at 3 months and 0.6% at 6 months among those who did not report early sex. In pooled analyses, men reporting early sex did not have higher HIV infection risk at 3 or 6 months. In Kisumu, 16 (1.3%) men had incomplete wound healing at the 30-day visit. One (6.3%) of these seroconverted at 3 months compared to 2 (0.2%) of 1,246 men with complete wound healing

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(p = 0.075). No association was observed between incomplete wound healing and seroconversion for Rakai participants.

Conclusion—Most men delayed intercourse after circumcision. Early sex after circumcision was not associated with HIV risk, though study power was limited. Nevertheless, men should delay intercourse to limit the potential for increased HIV risk until complete wound healing.

Keywords

male circumcision; wound healing; sexual intercourse; HIV risk; seroconversion; Africa

Introduction

Randomized clinical trials in South Africa, Uganda, and Kenya showed 50–61% efficacy in reducing HIV incidence among men undergoing circumcision compared to those who remained uncircumcised [1–3]. Based on these data, the World Health Organization now recommends male circumcision as an important element of HIV prevention programs [4]. There is concern, however, that for some men, male circumcision might increase HIV infection risk during the immediate post-operative period, if sexual intercourse is resumed before full wound healing. HIV infection risk may be increased through local inflammation during healing, compromised dermal integrity, or other mechanisms. To better inform recommendations for men and their partners, we assessed the risk of HIV seroconversion during the immediate postoperative period among men participating in three African circumcision trials.

Methods

Study populations and criteria for inclusion in this analysis

The Kisumu and Orange Farm trials enrolled men aged 18–24 years and the Rakai trial enrolled men aged 15–49 years. This analysis is limited to HIV-negative men who were randomized to and underwent circumcision. The analysis does not include control arm men who became circumcised through non-trial services. Kisumu participants had to be sexually active for trial eligibility, while the Orange Farm and Rakai trials included men with no prior sexually activity. This analysis included men who were not sexually active at enrollment since they could have initiated sex during follow-up. Trial recruitment, enrollment, reasons for refusing enrollment, and follow-up have been previously described [1–3]. The three trial protocols were approved by institutional review boards in the countries where the studies were conducted and in the donor countries. All trials were overseen by data and safety monitoring boards [1–3].

Circumcision procedures and surgical follow-up

The Orange Farm and Kisumu trials both used the “forceps guided” procedure [1,3], while the Rakai trial employed a sleeve resection method [2]. In the Orange Farm trial, participants were circumcised by general practitioners in their surgical offices. In the Kisumu and Rakai trials, circumcisions were performed by trained and certified medical doctors or clinical officers in the studies’ operating theatres.

Post-operative follow-up visits for wound assessment were scheduled at 24–48 hours, 5–9 days, and 4–6 weeks for Rakai; at 3, 8 and 30 days for Kisumu; and at 3 months for Orange Farm. In the Orange Farm trial, a nurse conducted a genital examination and recorded adverse events and wound healing at each follow-up visit. In the Rakai trial, adverse events and wound healing were assessed by clinical officers (similar to “physician’s assistants” [2]) and in the Kisumu trial by a medical doctor or clinical officer [3].

HIV Testing

HIV testing occurred prior to randomization in each trial, and detailed methods have been reported previously [1–3]. In Kisumu, testing was repeated 1, 3, 6, 12, 18, and 24 months after randomization [3]. In Rakai, testing was repeated 6, 12, and 24 months after randomization [2]. In Orange Farm, testing was repeated 3, 9, and 21 months after randomization. Each trial has reported their HIV testing methods [1–3]. This analysis includes HIV status at 3 months and at 6 months for Kisumu, at 3-months for Orange Farm, and at 6-months for Rakai.

Behavioral counseling on wound care and post-operative abstinence

Participants in the Orange Farm trial were counseled by certified counselors and the general practitioners performing the surgery to abstain from sex for 6 weeks [1]. In the Rakai trial, men were counseled by clinical officers, given written information on wound care, and advised to abstain from sex until wound healing was certified as complete [2]. In the Kisumu trial, men were counseled at the 3-, 8-, and 30- day follow-up visits by professional counselors, were given written instructions including directions on wound care, and were advised to abstain from sex for at least 1 month after the procedure [3].

Behavioral data collection

During scheduled post-operative visits, participants were asked if they had had intercourse since circumcision. In the Rakai trial men were asked, “Have you had intercourse since the operation?” In addition, the Rakai trial asked how many days after circumcision participants had first had sex. In the Kisumu trial at 3 days and 8 days after circumcision, men were asked, “Have you had sexual intercourse since circumcision?” At their 30-day visit they were asked, “How many times in the past month have you had sexual intercourse?” In the Orange Farm trial at the 3-month visit men were asked, “Did you have sex between your circumcision and today?”, and if yes, they were also asked how many days after circumcision they first had sex.

Data analysis

For this analysis the outcome was HIV seroconversion at 3 months (Orange Farm and Kisumu trials) and at 6 months (Rakai and Kisumu trials). The primary exposure variable was early resumption of sex after circumcision. For uniform comparison we defined resumption of sex after circumcision as early intercourse if sex was reported < 42 days after circumcision in Rakai and Orange Farms trials. For the Kisumu trial, men were not asked how many days after circumcision they first had sex; if the participant reported intercourse since circumcision on the 30-day visit and the visit date occurred within 42 days of circumcision, we inferred that intercourse occurred < 42 days after circumcision. The secondary exposure variable was complete wound healing at one month post-circumcision. The Rakai and Kisumu trials had clinician-assessed measures of wound healing. For the Kisumu and Rakai trials we also compared wound healing at the 30-day or 4-week visit and HIV seroconversion at 3 months (Kisumu only) and at 6 months. Comparable data were not available from Orange Farm.

Chi-square tests and Fisher’s exact tests were used to assess associations within trial site. Data for Kisumu and Rakai participants aged 18–24 and for Kisumu and all Rakai participants were pooled to compare HIV seroconversion at 6 months for men reporting early sex compared to those who did not report early sex. Exact methods were used (StatXact, version 8.0, Cytel Software, Inc.) to calculate site-specific and common odds ratios with exact confidence intervals.

Results

Socio-demographics and sexual behaviors

The age distribution among 18–24 year-old men was similar across sites (Table 1). A greater proportion of men in Rakai were currently married or living as married as compared to other participants. Among Orange Farm participants, 108 (8.4%) reported no sexual activity at enrollment, although 24 of these men reported sexual activity at their 3-month follow-up visit. Among 1,095 Rakai participants aged 18–24, 140 (12.8%) reported no sexual activity at enrollment and none of these men reported sexual activity at their 4-week follow-up. Kisumu participants were younger at sexual debut, had longer duration of sexual activity, and reported more partners during the past 12 months and in their lifetimes than the other trial sites.

The 30-day and 4-week follow-up visits were attended by 1,266 (95.1%) of Kisumu participants, and 2,282 (98.1%) of Rakai participants [1,068 (97.5%) aged 18–24] (Table 2). For Orange Farm, 1,293 of men attended the 3-month follow-up visit. Most 30-day and 4-week visits occurred 28–34 days after circumcision for Kisumu (89.7%) and Rakai (72.8%) participants. Among 18–24 year-olds, the proportion of men reporting early sex was similar for Kisumu (3.9%) and Rakai (5.4%) participants, but was much higher among Orange Farm trial participants (22.5%).

In all three trials, early sex was reported more often among men who were married or living as married, and among men with more sex partners in the past 12 months and in their lifetimes (Table 3). Early sex was not associated with earlier age at first intercourse, but was more likely among men with longer duration of sexual activity, although this was not statistically significant in the Rakai trial.

HIV seroconversions at 3 months by early resumption of sexual activity: Kisumu and Orange Farm trials

At the 3 month follow-up visit, there were 3 HIV seroconversions among 1,266 Kisumu participants (Table 2). Among 49 participants who reported early sex, there were no seroconversions, while 3 of 1,207 (0.2%) men who did not report early sex seroconverted (p-value > 0.999). There were 7 Kisumu participants who reported having intercourse since circumcision at their scheduled 30-day visit, but the visit date occurred more than 42 days after surgery, so we were unable to determine whether or not this was early sex. None of these men HIV-seroconverted at the 3 month visit. There was one HIV-seroconversion at 3 months among 1,293 Orange Farm participants. Among 289 men who reported early intercourse there was no seroconversion, while one of 995 participants who did not report early intercourse seroconverted (0.1%, p-value > 0.999). Combining data from the Orange Farm and Kisumu trials, the HIV seroprevalence at 3 months follow-up for both trials was 0.0% among men who reported early sex compared to 0.2% among men who did not report early sex after circumcision (p-value > 0.999).

HIV seroconversions at 6 months by early resumption of sexual activity: Kisumu and Rakai trials

Among 1,206 Kisumu participants who did not report early sex, 5 (0.4%) seroconverted by the 6-month follow-up visit, compared to 1 seroconversion among 49 (2.0%) men who reported early sex (Table 4). Among 1,008 Rakai participants aged 18–24, there were 8 (0.8%) seroconversions among 951 men who did not report early sex compared to 1 (1.8%) seroconversion among 56 men who reported early sex (Table 4). Combined, the seroprevalence at 6 months for 18–24 year-olds in the Kisumu and Rakai trials was 1.9% among men who reported early sex and 0.6% among men who did not report early sex. The combined odds ratio for seroconversion at 6 months for men reporting early sex was 2.99 [95% C.I.: 0.32 to 13.6;

p-value = 0.168; Table 4]. If the 7 Kisumu men in whom early sex could not be determined due to visit timing were classified as having early sex, then the combined odds ratio for seroconversion at 6 months for 18–24 year-old Kisumu and Rakai men reporting early sex would have been 2.84 (p-value = 0.181).

Among 2,170 Rakai participants aged 15–49, there were 12 (0.6%) HIV seroconversions among 1,193 men who did not report early sex compared to 2 (1.1%) seroconversions among 177 men who reported early sex (p-value = 0.637). Including all Kisumu and Rakai participants, the combined odds ratio for seroconversion at 6 months for men reporting early sex was 2.42 [95% CI: 0.45 to 8.57, p-value = 0.154]. Including the 7 Kisumu men in whom early sex could not be determined due to visit timing as having early sex resulted in a combined odds ratio for seroconversion at 6 months for men reporting early sex would of 2.35 (p-value = 0.163).

Circumcision wound healing and HIV seroconversion at 3 and 6 months

Among Kisumu participants, 16 (1.3%) men did not have complete wound healing at the 30-day visit. One (6.3%) of these 16 men seroconverted at 3 months while there were 2 (0.2%) seroconversions among 1,247 men with complete wound healing at the 30-day visit (p-value = 0.075). One of the 16 men with incomplete healing reported having early sex, but this was not the participant who seroconverted. The 30-day follow-up visit and wound assessment for the participant who seroconverted occurred at 24 days post-circumcision, and he reported having no sex partners since circumcision. At the 6-month visit, there was still only one seroconversion among the 16 men who did not have complete wound healing at the 30-day visit, while there were 5 (0.4%) seroconversions among 1,246 men who had clinically documented complete wound healing (p-value = 0.145).

Among 18–24 year-old Rakai trial participants, 122 (11.4%) men did not have complete wound healing at the 4-week visit. Of these men, 112 had HIV test results available at 6 months, and none seroconverted. This did not differ from seroconversions among men with complete wound healing (9/888 [1.0%]; p-value =0.684). Two (1.6%) of the 122 men with incomplete wound healing reported early sex. Among 15–49 year-old Rakai participants, 318 (13.9%) men did not have complete wound healing at the 4-week visit. Of these men, 302 had HIV test results available at 6 months and 2 (0.7%) seroconverted. This did not differ from seroconversions among men with complete wound healing (12/1,869 [0.6%]; p-value > 0.999). Fifteen (5.0%) of the 302 men with incomplete wound healing reported early sex; none of these men seroconverted.

Discussion

Only a small proportion of men in the Kisumu and Rakai circumcision trials reported sexual intercourse within 42 days of circumcision. We found no seroconversions at 3 months post-circumcision in men who reported early sex and no association between early resumption of sex and HIV seroconversion by 3 or 6 months compared to men who did not report early sex. Nevertheless, the point estimates for the site-specific and combined ORs of HIV infection for those men who resumed sex early versus those who did not were greater than one among Kisumu and Rakai trial participants, suggesting the possibility of an increased risk. In the immediate post-operative period, it is conceivable that HIV infection risk may be increased through local inflammation during healing or compromised dermal integrity. There is little evidence of an association between incomplete wound healing and HIV acquisition. There was just one seroconversion at 3 months among men who reported incomplete wound healing in Kisumu, and no association between incomplete wound healing and HIV seroconversion at 6 months in Kisumu and Rakai.

Each trial anticipated the potential for increased HIV infection during the post-operative period, and included robust counseling of participants on wound care and abstinence. The Kisumu trial recommended abstinence for 4 weeks, while the Rakai trial recommended abstinence until certified wound healing. Over 94% of men in the Kisumu and Rakai trials reported abstinence for at least 42 days suggesting that this health education was effective. In the Orange Farm trial, 22% of men reported early sex after circumcision, although the longer time until assessment (3 months) may have limited men's ability to recall when they resumed sex. Alternatively, more men in the Orange Farm trial may have had early sex. Differences in reported adherence to advice to abstain from sex may reflect differences in the counseling programs. The counseling regimen in the Orange Farm trial was designed to approximate programmatic implementation of circumcision. Nevertheless, the differing counseling approaches resulted in 78–95% client compliance with abstinence recommendations. In contrast to the clinical trials, implementation of circumcision programs in community settings will likely not provide multiple, immediate follow-up visits and counseling after the surgery. Thus, identifying effective and reproducible counseling strategies in diverse settings is critical for programmatic male circumcision implementation to limit the potential for increased HIV infection risk during the early postoperative period.

More men in Rakai than in Kisumu did not have certified wound healing at the 4-week follow-up. This may be explained in part by the different timing of visits, with a greater proportion of Rakai than Kisumu participants attending a follow-up visit at 21–27 days (Table 2). Healing was assessed by physical examination in both trials. In Rakai, complete wound healing was defined as, "healthy scar formation; no scab or open wound." In Kisumu, complete wound healing was defined as, "no scab, open wound, swelling or redness." Such subtle differences in definitions or in ascertainment may affect comparability of healing. Also, it is possible that differences in time until complete wound healing reflected the different surgical methods (i.e., sleeve versus forceps guided procedures, cautery versus ligation for hemostasis). Despite the greater proportion of Rakai men who were classified as having incomplete wound healing at the 1-month visit, we found no association between incomplete wound healing and HIV-seroconversion at 6 months. The precise date of complete wound healing is unknown, as wound status was only determined when the participant presented at the follow-up visit. Only 17 (5.3%) of 318 men with incomplete wound healing in the two trials reported early intercourse. Although intercourse prior to complete wound healing may have been underreported, men with incomplete wound healing may be less likely to have sex as a result of comprehensive counseling or physical discomfort. In the Rakai trial, resumption of intercourse prior to complete wound healing was associated with increased surgical complication rates [8].

As adult male circumcision is implemented in programmatic settings, HIV-positive men undergoing circumcision may require different recommendations for wound healing and sexual abstinence, as wound healing is delayed in HIV-positive men compared to HIV-negative men [6–7,8].

Limitations

This analysis was limited by the low number of seroconversions in the 6 months following circumcision, and had insufficient power to detect meaningful associations. For example, with a sample of 2,200 individuals (approximately the number of participants included across two trials), 10% of men reporting early sex, and 0.6% HIV seroconversions, the probability of detecting an odds ratio of 3.0 as statistically significant at the $p<0.05$ level is 48% (2-sided Wald test). Sexual intercourse less than one month after surgery will occur less frequently than the 10% estimate of early sex using a 6 week definition. As to what the exact recommendation for delay of sexual intercourse after circumcision should be–until complete wound healing, 30 days, or 6 weeks–requires closer study of variability and progression of wound healing. This

analysis was limited to men who were HIV negative at enrollment, as the goal was to ascertain whether there was an increased risk for HIV infection associated with early resumption of sex after surgery. The trials differed in the timing of follow-up visits, surgical and counseling approaches, assessment of wound healing, and methods to determine resumption of sex after surgery, and these differences may constrain this combined analysis.

Conclusions

In the Kisumu and Rakai trials, less than 6% of men reported having early sex after circumcision, and very few reported sex prior to wound healing. The proportion reporting early sex was higher in Orange Farm. It will be important to evaluate adherence to instructions to delay resumption of intercourse once service programs roll out. Although the difference in HIV incidence was not statistically significant among men reporting early resumption of sex, the data do not preclude the possibility that their risk of acquiring HIV may be increased. The protective effect of male circumcision on HIV seroconversion observed in the three trials incorporates any potential increased risk associated with early resumption of sex. Thus while there may be increased risk of HIV seroconversion among men undergoing circumcision who resumed sex early compared to men who did not resume sex early, the protective effect of circumcision over 18 – 24 months was strong and highly statistically significant. However, the trial results were in the context of vigorous counseling against resumption of sex before full wound healing. When circumcision is made widely available there may be less opportunity for such intense counseling. Therefore, monitoring of early sex and assessments of HIV infections attributable to early sex should be part of programs providing widespread MC services. Circumcision programs should ensure counseling and instruction for wound care, personal wound assessment, and sexual abstinence, to limit the possible risk of HIV infection during the early post-operative period. Enhanced counseling should include active involvement of female partners where possible, and intense counseling for married men who are more likely to resume sex early.

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Table 1

Socio-Demographic and Sexual Behaviors at Enrollment of HIV-Negative Men Enrolled in Randomized Controlled Trials of Male Circumcision, Who Were Randomized to and Underwent Circumcision, by Trial Site.

Baseline Characteristics – n (%)	Rakai		Kisumu N=1,331	Orange Farm N=1,293
	All Men N=2,326	Aged 18–24 N=1,095		
Age in years at enrollment				
18–20		622 (56.8)	678 (50.9)	631 (48.8)
21–24		473 (43.2)	653 (49.1)	662 (51.2)
Married or living as married				
Never or not currently	1,226 (52.7)	849 (77.5)	1,253 (94.4)	1,270 (98.2)
Currently	1,100 (47.3)	246 (22.5)	74 (5.6)	23 (1.8)
Education completed*				
None, Primary 1–8	1,684 (72.4)	716 (65.4)	448 (33.7)	273 (21.1)
Secondary 1–4	494 (21.2)	299 (27.3)	754 (56.6)	1,020 (78.9)
Post-secondary	148 (6.4)	80 (7.3)	129 (9.7)	
Age at First Intercourse				
Never sexually active	242 (10.6)	140 (13.2)		108 (8.4)
Less than 16 years old	719 (31.5)	387 (36.3)	631 (49.0)	404 (31.3)
16 or more years old	1,321 (57.9)	538 (50.5)	656 (51.0)	781 (60.4)
Among those sexually active…				
Number of years being sexually active				
Less than 5 years	553 (27.1)	459 (49.6)	588 (45.9)	619 (52.3)
5 or more years	1,486 (72.9)	466 (50.4)	692 (54.1)	565 (47.7)
Number of sex partners in the past 12 months				
None	200 (9.6)	128 (13.4)	35 (2.7)	215 (18.1)
One	1,079 (51.8)	464 (48.6)	465 (35.3)	547 (46.2)
Two	514 (24.7)	207 (21.7)	375 (28.5)	226 (19.1)
Three or more	291 (14.0)	156 (16.3)	441 (33.5)	197 (16.6)
Number of lifetime sex partners				
One	265 (12.7)	180 (18.9)	98 (8.0)	124 (10.5)
Two	280 (13.4)	166 (17.4)	173 (14.0)	172 (14.5)
Three	282 (13.5)	153 (16.0)	219 (17.8)	199 (16.8)
Four or more	1,256 (60.3)	456 (47.8)	742 (60.2)	690 (58.2)

Not all cells sum to N due to missing responses;

* Post-secondary was not assessed for Orange Farm; Grade levels were not equivalent with Kisumu and Rakai, thus “None, Primary 1–8” represents “Grades 2–9” for Orange Farm, and “Secondary 1–4” represents “Grades 10–12” for Orange Farm”

Table 2

Follow-up Visits and Sexual Activity After Circumcision by Trial Site.

Follow-Up Characteristics – n (%)	Rakai		Kisumu N=1,266	Orange Farm N=1,293
	All Men N=2,282	Aged 18–24 N=1,068		
Time from Enrollment to 30-Day or 4-Week Follow-up Visit				
< 21 days	2 (0.1)	2 (0.2)	1 (0.1)	
21 – 27 days	513 (21.5)	270 (25.3)	66 (5.3)	
28 – 34 days	1,661 (72.8)	742 (69.5)	1,125 (89.7)	
35 – 41 days	70 (3.1)	32 (3.0)	36 (2.9)	
42 days or more	36 (1.6)	22 (2.1)	26 (2.1)	
At 30-Day or 4-Week Follow-Up Visit: Had Sex Since Circumcision				
No	2,094 (91.8)	1,009 (94.5)	1,207 (95.6)	
Yes	188 (8.2)	59 (5.5)	56 (4.4)	
At 30-Day or 4-Week Follow-Up Visit: Number of days after circumcision had sex[^]				
Did not have sex	2,094 (91.8)	1,009 (94.6)	1,207 (96.1)	
Less than 42 days	186 (8.2)	58 (5.4)	49 (3.9)	
At 3-Month Follow-Up Visit: Number of days after circumcision had sex[*]				
Have not had sex				491 (38.2)
Less than 28 days				101 (7.6)[*]
Less than 35 days				263 (19.8)[*]
Less than 42 days				289 (22.5)[*]
42 days or more				504 (39.3)
HIV Status at 3 Months				
Negative			1,263 (99.8)	1,292 (99.9)
Positive			3 (0.2)	1 (0.1)
HIV Status at 6 Months				
Negative	2,244 (99.3)	1,019 (99.1)	1,259 (99.5)	
Positive	15 (0.7)	9 (0.9)	6 (0.5)	
At 4-Week or 30-Day Follow-Up: Wound Healing is Complete				
Yes	1,963 (86.1)	946 (88.6)	1,247 (98.7)	
No	318 (13.9)	122 (11.4)	16 (1.3)	

Some cells do not sum to N due to missing responses.

[^] Unable to determine the timing of resumption of sex after surgery for 7 men in the Kisumu trial who reported having intercourse prior to the 30 day post-surgery visit since the visit was dated more than 42 days after surgery. None of these men HIV-seroconverted at 3 or at 6 months.

[*] Cumulative percentages are presented for timing of resumption of sex after surgery for Orange Farm.

Table 3

Number and Percent of Men Reporting Sex Less than 42 Days After Circumcision by Socio-Demographic and Sexual Behavior Characterization at Baseline by Trial Site.

Baseline Characteristics	Number (%) Reporting Sex < 42 Days After Circumcision		
	Rakai, Aged 18–24 N=1,066	Kisumu N=1,256	Orange Farm^ N=1,284
Age in years at enrollment			
18 – 20	16 (2.6)*	24 (3.7)	121 (19.3)†
21 – 24	41 (8.9)	24 (3.9)	168 (25.6)
Married or living with someone as married			
Never or not currently	25 (3.0)*	39 (3.3)*	279 (22.1) r
Currently	32 (13.4)	8 (12.1)	10 (32.5)
Education completed			
None, Primary 1–8	44 (6.3)	27 (6.5)†	51 (18.7)
Secondary 1–4	8 (2.7)	20 (2.8)	238 (23.6)
Post-secondary	5 (6.5)	1 (0.8)	
Among those sexually active…			
Age at First Intercourse			
Less than 16 years old	19 (5.1)	24 (4.1)	107 (26.7)
Age 16 years or older	37 (7.0)	23 (3.7)	172 (22.2)
Number of years being sexually active			
Less than 5 years	23 (5.1)	13 (2.3)†	120 (19.5)*
5 years or more	33 (7.3)	34 (5.2)	159 (28.3)
Number of sex partners in the past 12 months			
None or One	26 (4.5) r	9 (1.9)†	165 (21.8) r
Two or more	30 (8.5)	39 (5.1)	114 (27.1)
Number of lifetime sex partners			
One or Two	11 (3.3) †	4 (1.5)	45 (15.3)*
Three or more	45 (7.6)	37 (4.1)	234 (26.5)

Denominators are smaller than those used in Table 2 as the samples for this analysis are restricted to those with complete demographic and behavioral data.

^For Orange Farm: “Number at risk” includes 504 men who reported having sex 42 days or more post circumcision in the Orange Farm trial.

P-value for comparison of reporting early sex by socio-demographics and behavioral characteristics:

*p-value <0.001;

†0.001< p-value <0.01;

r0.01< p-value <0.05; based on chi-square test.

Table 4

Odds Ratio of HIV Seroconversion at 6 Months for Early Resumption of Sex After Circumcision by Trial Site and Combined*.

	Number (%) Testing HIV Positive at 6 Months		
Had sex less than 42 days from circumcision date	**Kisumu**	**Rakai**	
		Aged 18–24	**All Men**
No	5 (0.4)	8 (0.8)	12 (0.6)
Yes	1 (2.0)	1 (1.8)	2 (1.1)
Site-Specific Odds Ratio [95% CI]	5.00 [0.10 – 45.9] *p-value = 0.426*	2.11 [0.05 – 16.2] *p-value = 0.818*	1.89 [0.20 – 8.57] *p-value = 0.637*
Combined Odds Ratio [95% CI] *18–24 Year-Olds*	2.99 [0.32 – 13.6] *p-value = 0.168*		
Combined Odds Ratio [95% CI] *All Rakai and Kisumu participants*	2.42 [0.45 – 8.57] *p-value = 0.154*		

* The site-specific odds ratio is the odds ratio for the single trial site indicated. A combined odds ratio is the odds ratio for the indicated trial sites' data combined. Point estimates, 95% confidence intervals (CIs) and p-values for site-specific and common odds ratios are based on exact methods.