



## Self-Assessment of Circumcision Status by Adolescents

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In epidemiologic studies of the relation between circumcision and sexually transmitted infections, it is necessary to rely on self-report of circumcision status. The purpose of this 2002 study in Houston, Texas, was to determine whether adolescent males could make correct self-reports. During physical examinations, adolescents were asked whether they were circumcised. The authors then examined the adolescents' genitalia. Circumcision status was recorded as complete (glans penis fully exposed), partial (glans partly covered), or uncircumcised (glans completely covered). The mean age of the 1,508 subjects was 15.0 (standard deviation, 1.63) years; 64% were Black, 29% Hispanic, and 7% White. Forty-nine percent had full, 1% partial, and 50% no circumcision. Of the 738 fully circumcised subjects, 512 (69%) considered themselves circumcised, 54 (7%) considered themselves uncircumcised, and 172 (23%) did not know. Of the 751 uncircumcised youth, 491 (65%) described themselves as uncircumcised, 27 (4%) reported being circumcised, and 233 (31%) did not know. The sensitivity of self-report among those who thought they knew their status was 90.5%, and the specificity was 94.8%; 27% did not know their status. In this population, self-report of circumcision status did not result in accurate information mainly because many adolescents were unsure of their status.

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The relation between male circumcision and the risk of various sexually transmitted infections in both males and females has been the subject of research for decades (1–7). In large epidemiologic studies, it may not be possible or practical to examine male genitalia, so self-report of circumcision status becomes important. However, women are not very accurate in classifying the circumcision status of their sexual partners, men are not always accurate in classifying themselves, and physicians do not always agree (1–3).

The purpose of this study was to determine whether adolescent males could make correct self-reports of their circumcision status.

### MATERIALS AND METHODS

Between May 1 and September 30, 2002, we evaluated adolescents in three settings in Houston, Texas: the Community Partners Adolescent Health Center, a school-based clinic; the Incarnation Health Center, a school-linked clinic; and the Harris County Juvenile Detention Center. All sites

serve primarily indigent youth. In the first two settings, the assessments were made during preparticipation sports examinations; at the third site, circumcision status was assessed during health maintenance evaluations.

Subjects were evaluated by four adolescent medicine faculty (two board-certified adolescent medicine physicians, one third-year adolescent medicine fellow, and one nurse practitioner trained in adolescent medicine) and six second-year pediatric resident physicians. All clinicians used standardized procedures for asking questions about circumcision status and for examining the penis; the physician who asked about circumcision status also performed the examination. Before the examination, subjects were asked whether they were or were not circumcised or if they did not know. During the examination, the clinicians recorded circumcision status as follows: fully circumcised, if the corona of the glans penis was completely visible; uncircumcised, if the glans was completely covered; and partially circumcised, if the glans was partially covered. In the latter group, it was unclear whether circumcision had failed to remove the entire fore-

**TABLE 1. Circumcision status of adolescent males seeking preparticipation sports examinations or health maintenance evaluations, Houston, Texas, May–September 2002**

	Blacks (n = 961)		Hispanics (n = 431)		Whites (n = 98)		All subjects (n = 1,508)	
	No.	%	No.	%	No.	%	No.	%
Fully circumcised	560	58	93	22	80	82	738	49
Uncircumcised	390	41	332	77	17	17	752	50
Partially circumcised	11	1	6	1	1	1	18	1

skin or if the uncircumcised foreskin was short. Information was entered onto a data form that included the age and race/ethnicity of the subject.

Agreement between the subject's and the clinician's assessment was evaluated for all subjects, for subjects by age and race/ethnicity, and for subjects by examination site. In a subset of 85 adolescents unsure of their status, we evaluated their ability to correctly identify their status from a picture. Sensitivity and specificity were calculated by using the physician examination as the "gold standard." Agreement between physician and subject was assessed by using the probability-corrected kappa statistic.

This study was approved by the Committee for the Protection of Human Subjects of the University of Texas-Houston Health Sciences Center and by the administration of the clinical sites where the study was conducted. No subject refused to participate.

# RESULTS

The mean age of the 1,508 subjects was 15.0 (standard deviation, 1.63) years; 64 percent were Black, 29 percent Hispanic, and 7 percent White. The circumcision status of the subjects is presented in table 1. Comparison of self-reported circumcision status and physical examination is shown in table 2. For those who thought they knew their status, the sensitivity of self-report was 90.5 percent (95 percent confidence interval: 87.7 percent, 92.8 percent) and the specificity was 94.8 percent (95 percent confidence interval: 92.5 percent, 96.5 percent). When those who did not know their status were excluded, agreement between clinician and subject was 93 percent ( $\kappa = 0.85$ ,  $p < 0.001$ ); however, when those who did not know their status

were considered not to agree with the clinician, agreement was 67 percent ( $\kappa = 0.35$ ,  $p < 0.001$ ).

Agreement did not differ much according to site. Self-report did not agree with clinical assessment for 57/741 (7.7 percent) subjects at the Community Partners Adolescent Health Center, 9/95 (9.5 percent) at the Incarnation Health Center, and 15/248 (6.0 percent) at the Harris County Juvenile Detention Center. Agreement also did not differ much by race/ethnicity. Self-report did not agree with clinical examination for 58/766 (7.6 percent) Blacks, 19/228 (8.3 percent) Hispanics, and 4/79 (5.1 percent) Whites. Partially circumcised subjects and those who were unsure of their status were excluded from these analyses.

Of the 85 subjects who did not know their status and were asked to identify this status from a picture of a circumcised and uncircumcised penis, 28/34 (82 percent) of fully circumcised youth were able to do so, as were 22/51 (43 percent) of uncircumcised youth.

# DISCUSSION

The adolescents in this study who thought they knew their circumcision status were correct more than 90 percent of the time. However, 23 percent of fully circumcised and 31 percent of uncircumcised youth did not know their status. These findings are similar to previous findings: for example, in a 1958 study (1), 33 percent of circumcised men did not know their status. A previous study of adolescents found that circumcised youth are more uncertain of their status than are the uncircumcised (8), which our study did not support. In a limited analysis, many of the youth who did not know their status could not correctly identify it from a picture.

Our results indicated that, in this group of mostly indigent, primarily Black and Hispanic youth, self-report of circumci-

**TABLE 2. Agreement between adolescent males and clinicians on subjects' circumcision status, Houston, Texas, May–September 2002**

Subject	Clinician						Total
	Yes		No		Partially circumcised		
	No.	%*	No.	%	No.	%	
Yes	512	69	27	4	5	28	544
No	54	7	491	65	9	50	554
Don't know	172	23	233	31	4	22	409
Total	738	100	751	100	18	100	1,507

\* Percentages do not total 100 because of rounding.

sion status was not accurate enough to permit a valid epidemiologic study of the relation between circumcision and sexually transmitted diseases. Even if extra subjects were recruited to adjust for the potential missing data, it is unclear how excluding those who do not know their circumcision status might bias the results. Risk behaviors of those who do not know their circumcision status may differ in important ways. Although little research exists on differences in sexual activity between circumcised and uncircumcised men, a few studies suggest that circumcision may result in the need for greater stimulation to reach orgasm and may lead to more risky sexual behaviors (9, 10). There may also be differences in sexual risk-taking behavior among men who know their circumcision status compared with men who do not. We must determine whether differences occur before we can assume that no bias is introduced by leaving out those who do not know their circumcision status in future studies of circumcision status and health risk.

This study, unlike some others, differentiated between fully, partially, and uncircumcised subjects. The proportion of partially circumcised youth was small (1.2 percent). This proportion, when reported, has varied among studies, for example, from 4 percent to 36 percent in the studies mentioned at the beginning of this article (1, 3). Because risk of sexually transmitted diseases may be different for partially compared with fully or uncircumcised men, this variable should be evaluated in studies that assess the relation between circumcision and risk of disease.

Limitations of our study include the use of multiple examiners. Although all received training in conducting the study, including physical evaluation of circumcision status, some misclassification may have occurred. We did not assess the reproducibility of the subjects' self-report of circumcision status nor of the clinician's physical findings. It seems unlikely that the clinicians were influenced by the subject's response when classifying circumcision status by examination. The three classifications were unambiguous. Another

problem concerns generalizability: this sample of indigent, mainly minority adolescents may have been less able to provide an accurate self-assessment of circumcision status than could other study samples of teenagers.

In conclusion, we found that this group of adolescents was not able to accurately assess their circumcision status, most often because many did not know whether they were circumcised.

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