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Race, insurance status, and desire for tubal sterilization reversal

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Abstract

Objective—To examine the independent effects of race/ethnicity and insurance status on desire for tubal sterilization reversal.

Design—Secondary analysis of cross-sectional data collected by the 2002 National Survey of Family Growth (NSFG).

Setting—Interviews were conducted in person by a trained female interviewer in the participant's home.

Patient(s)—The NSFG is designed to represent women and men 15–44 years of age in the U.S. household population. The sample consisted of 934 women who had undergone tubal sterilization at any time before being interviewed.

Intervention(s)—None.

Main Outcome Measure(s)—Desire for sterilization reversal.

Result(s)—Among women older than 30 years at time of surgery, black women were significantly more likely to desire sterilization reversal compared with white women (adjusted odds ratio, 2.6; 95% confidence interval, 1.2, 5.8). In the total cohort and in the subset of women 30 years or younger, there were no significant racial/ethnic variations in desire for sterilization reversal.

Conclusion(s)—Among women over age 30 at the time of tubal sterilization, black women were much more likely to express desire for reversal than white women.

Keywords

Tubal sterilization; poststerilization regret; desire for reversal; race/ethnicity; insurance status

Tubal sterilization is the second most commonly used method of contraception in the United States (1). Racial/ethnic variations exist in the use of this procedure (1). In an analysis using the 2002 National Survey of Family Growth (NSFG), black women were more likely to be sterilized compared with white women after controlling for important socioeconomic confounders such as age, insurance status, marital status, education, parity, religion, and income (2). Women with no or public insurance were also more likely to have undergone sterilization compared with women with private insurance.

While tubal sterilization is a highly effective method of contraception, it has the potential downside of being permanent. Although few women seek reversal for the procedure, the prevalence of poststerilization regret ranges from 0.9% to 26% and varies by the length of time since the procedure (3,4). Studies examining risk factors for poststerilization regret show that young age at the time of the sterilizing procedure is the strongest predictor for expressing regret (4-9). Nonwhite race has also been found to be associated with poststerilization regret, but these analyses did not assess the independent effect of race/ethnicity after adjusting for important socioeconomic characteristics (4-8).

To determine whether an increased rate of sterilization among black women and women with public or no insurance is associated with increased poststerilization regret, we used the 2002 NSFG database to examine the independent effects of race/ethnicity and insurance status on desire for sterilization reversal.

MATERIALS AND METHODS

Study Design

This study used data collected by Cycle 6 (2002) of the NSFG, a national cross-sectional survey. The NSFG is a periodic study conducted by the National Center for Health Statistics, an agency of the Department of Health and Human Services, to provide national estimates of factors affecting pregnancy and birth outcomes, including sexual activity, contraceptive use, marital status, infertility, and use of medical services for family planning. For the 2002 NSFG, interviews were conducted between March 2002 and March 2003. This study was approved by the University of Pittsburgh Institutional Review Board.

Study Population

The NSFG is based on a national multistage probability sample designed to represent women and men 15-44 years of age in the household population of all 50 states and the District of Columbia. The 2002 NSFG sample included 7643 women and 4928 men. Teenage, black, and Hispanic participants were oversampled. Interviews were conducted in person by a trained female interviewer in the selected person's home. The overall response rate was approximately 80%. This analysis focused only on those women who had undergone tubal sterilization at any time before being interviewed.

Study Outcome and Covariates

The outcome variable in this analysis was desire for reversal of tubal sterilization at the time of interview. All women who had indicated that they had undergone tubal sterilization were asked, "If your tubal sterilization could be reversed safely, would you want to have it reversed?" Possible answers were "definitely yes," "probably yes," "probably no," "definitely no," and

“don't know.” One woman had already had a reversal, and three women either refused to answer or said they did not know; these women were excluded from further analyses. Responses were dichotomized into “yes” (includes “definitely yes” and “probably yes”) and “no” (includes “definitely no” and “probably no”) categories for this analysis.

The primary predictors of interest were self-reported race or ethnicity and medical insurance status. Race categories included Hispanic, non-Hispanic white, non-Hispanic black, and non-Hispanic other (Asian, Pacific Islander, Alaskan native, and American Indian). Although we were more interested in a women's medical insurance status at the time of sterilization rather than at the time of interview, this information was not available to us. Instead, we had information regarding method of payment for sterilization for those women who underwent the procedure after January 1997. Because Medicaid paid for the majority of tubal sterilizations for women who reported Medicaid, public insurance, or no insurance at the time of interview, these categories were collapsed into one for all our analyses. As such, the public insurance category in this analysis included Medicaid, Medicare, Medi-Gap, Indian Health Service, Children's Health Insurance Program (CHIP), state-sponsored, or other government program. Age at procedure, time elapsed since procedure, education level, income, parity, religion, and marital status were examined as potential confounders in this study.

Statistical Analysis

Because the “other” race and “other” religion categories were too heterogeneous and too limited a sample size (25 observations and 21 observations, respectively) to produce any meaningful conclusions, these categories were excluded from all analyses. Only two women who were asked about their desire for reversal reported being under age 18 at the time of their sterilization procedure. To remain consistent with the age group (18-44) used in prior analyses examining sterilization regret (5-7), we also excluded these two women from our study.

We described baseline sociodemographic characteristics of women by race/ethnicity using χ^2 -tests for all categorical variables. We then examined the bivariate association between desire for tubal sterilization reversal and each covariate. Only those covariates that demonstrated a significant association with the outcome variable ($P < .10$) were used in the subsequent regression analyses. A multivariable logistic regression model was used to determine the adjusted odds ratios (ORs) of expressing desire for reversal. We assessed for potential interactions between race/ethnicity and the various levels of age, insurance status, marital status, income, education, parity, and religion. Because prior literature has demonstrated a strong association between age at the time of surgery and subsequent poststerilization regret (4-9), we also conducted multivariable logistic regression analyses stratified by age groups (18-30 and >30 years). We chose to use age 30 as the cutoff point between age groups because we sought consistency with other analyses including the U.S. Collaborative Review of Sterilization study that have used this cutoff point (4,6,7).

Statistics for this project were produced using STATA software, version 9.0 (StataCorp, College Station, TX), using appropriate adjustment for the NSFG's complex sample design. All estimates were weighted to reflect the national female household population ages 15-44. However, actual sample sizes are given in all of the tables.

RESULTS

Our sample included 934 women who had undergone tubal sterilization. Table 1 depicts the baseline characteristics of the study sample at the time of interview. Of the women included, 61% were non-Hispanic white, 20% were Hispanic, and 19% were non-Hispanic black. Overall, nearly 24% expressed desire for reversal of sterilization. Thirty percent of black women and 27% of Hispanic women expressed desire for reversal compared with 21% of white

women ($P=.07$). Black and Hispanic women were more likely to have either public or no insurance, to have been younger at the time of their sterilization procedure, and to have lower income than their white counterparts. Compared with the entire NSFG sample of 7643 women, our sample had similar sociodemographic characteristics except that women in our sample were more likely to have ever been married and to have three or more children (table not shown).

Table 2 shows results from unadjusted and adjusted regression analyses. In unadjusted analyses, black race (OR, 1.6; 95% confidence interval [CI], 1.0, 2.6), public/no insurance (OR, 2.0; 95% CI, 1.2, 3.2), and never having been married (OR, 1.8; 95% CI, 1.1, 3.0) were significantly associated with increased desire for reversal of tubal sterilization. Age over 30 at time of surgery (OR, 0.4; 95% CI, 0.2, 0.6) and higher education levels (OR, 0.7; 95% CI, 0.4, 1.0) were associated with decreased desire for sterilization reversal. Neither religion nor mean time since sterilization procedure was significantly associated with the outcome variable. In the adjusted analysis, the only significant predictor of desire for sterilization reversal was being age 30 years or younger at the time of surgery. Although black race (adjusted OR, 1.3; 95% CI, 0.8, 2.3), Hispanic ethnicity (adjusted OR, 1.1; 95% CI, 0.7, 1.8), and public or no insurance (adjusted OR, 1.4; 95% CI, 0.8, 2.5) did predict higher rates of regret, these associations did not reach statistical significance after adjusting for all other covariates. No significant interactions were found between race/ethnicity and any of the covariates.

Table 3 depicts results from the stratified, adjusted analysis. Among the 373 women in the older age group (>30 at the time of surgery), black women were significantly more likely to express desire for reversal compared with white women (adjusted OR, 2.6; 95% CI, 1.2, 5.8). Income above 499% of the poverty level was also associated with increased regret (adjusted OR, 28.4; 95% CI, 6.4, 125.0). However, this is probably an unstable estimate as there were only 11 women in this group. Among the 561 women in the younger age group (18-30 at the time of surgery), Hispanic and black women were equally likely to express desire for reversal as white women (adjusted OR, 1.0; 95% CI, 0.6, 1.8, and adjusted OR, 1.1; 95% CI, 0.5, 2.2, respectively). Insurance status was not a significant predictor of regret in either of the age strata.

DISCUSSION

Among women who were over age 30 at the time of tubal sterilization, black women were nearly 3 times as likely to express desire for reversal compared with white women. However, we found no racial/ethnic differences in desire for reversal in the subset of women who were 30 years or younger at the time of tubal sterilization or in the cohort overall. We found no association between women's health insurance status and desire for sterilization reversal in any of the adjusted analyses.

It is possible that our findings stem from differences in provider counseling based on age. Because there is extensive literature documenting young age to be a strong predictor of poststerilization regret, the American College of Obstetricians and Gynecologists recommends extensive presterilization counseling for younger women (3). Providers, therefore, may not significantly vary their counseling technique for this subset of women. For women of older ages, however, physician behavior may play a greater role. There is literature that shows that older age, multiparity, and black race increase a gynecologist's willingness to perform sterilization (10) and that health care providers may use insurance status as a proxy of a patient's ability to support a family (11). Since black women are more likely to be multiparous and have public/no insurance (1), providers may use this information separately or in concert to recommend tubal sterilization.

Another possible explanation may involve social factors. Prior studies have indicated that, in addition to young age, a change in partner/marital status is a predictor of sterilization regret (8). Young women, by virtue of their age, have more time to experience changes in life circumstances regardless of race/ethnicity. However, among the older women, the higher rates of regret observed in black women may reflect the fact that they are more likely to experience a higher rate of change in partners compared with white women (12).

There are important limitations to consider in interpreting the results of this analysis. First, expressing desire to reverse sterilization in a theoretical situation might not necessarily mean that a woman would not make the same choice again if given another chance. For this reason, these rates may overestimate true sterilization regret.

Second, information on factors that may be important in predicting subsequent regret are obtained at the time of interview rather than at the time the decision was made. It is unlikely, however, that this limitation had an impact on the two main primary predictor variables of this study (race/ethnicity and insurance status). Race/ethnicity is a stable variable, while insurance status was strongly correlated with payment method at the time of sterilization. Among those women with private insurance at the time of the interview, 86% paid for their sterilization with private insurance. Among those women with Medicaid at the time of interview, 81% paid for their sterilization with Medicaid. Among women with no insurance or public insurance (other than Medicaid), the majority (57% and 62%, respectively) paid for their sterilization with Medicaid.

In summary, we found that after controlling for important socioeconomic factors, black women who were over age 30 at the time of their tubal sterilization were much more likely to express desire for reversal than white women of a similar age. Although further studies are needed to examine the source of regret for this subset of women, presterilization counseling should take into account their higher rate of regret.

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TABLE 1 Baseline demographic and socioeconomic characteristics of the sample by race/ethnicity (n=934).^a

Variable	White (n = 422)	Hispanic (n = 251)	Black (n = 261)
Total sample	60.6	20.0	19.4
Desire sterilization reversal	20.7	27.5	29.8
Insurance status:			
Private	64.5	42.6	57.7
Public/none ^b	35.5	57.4	42.3
Age at surgery, years:			
18-30	55.2	62.0	67.2
>30	44.8	38.0	32.8
Poverty level ^c :			
<100%	17.3	41.2	34.1
100%-499%	79.5	55.5	63.6
>499%	3.2	3.3	2.3
Education:			
High school diploma or less	55.8	77.0	59.1
At least some college	44.2	23.0	40.8
Parity:			
0 children	2.1	1.7	0.5
1 or 2 children	48.3	30.4	45.5
3 or more children	49.6	67.8	54.0
Marital status:			
Ever been married	93.0	85.5	70.6
Never been married	7.0	14.5	29.4
Religion:			
None	13.4	12.2	8.9
Catholic	23.2	62.5	3.5
Protestant	63.4	25.3	87.6

Note: *P*-values for all comparison (using χ^2 -tests) were <.01 except for "desire sterilization reversal" (*P*=.07). All data are percents.

^aWeighted to reflect the U.S. female civilian noninstitutional population.

^bPublic insurance included Medicaid, Medicare, Medi-Gap, Indian Health Service, CHIP, state-sponsored, or other government program.

^cPoverty threshold based on 2001 level defined by the U.S. Census Bureau, which takes into account total household income and number (i.e., \$18,104 for a family of four).

TABLE 2 Unadjusted and adjusted odds of expressing desire for tubal sterilization reversal (n = 934).^a

Variable	Unadjusted analysis: OR and 95% CI	Adjusted analysis ^b : OR and 95% CI
Race/ethnicity:		
White	Reference	Reference
Hispanic	1.5 (0.9, 2.3)	1.1 (0.7, 1.8)
Black	1.6 (1.0, 2.6)	1.3 (0.8, 2.3)
Insurance status:		
Private	Reference	Reference
Public/none ^c	2.0 (1.2, 3.2)	1.4 (0.8, 2.5)
Age at surgery, years:		
18-30	Reference	Reference
>30	0.4 (0.2, 0.6)	0.4 (0.3, 0.7)
Poverty level ^d :		
<100%	Reference	Reference
100%-499%	0.5 (0.4, 0.8)	0.9 (0.5, 1.4)
>499%	1.0 (0.5, 2.2)	2.4 (0.9, 6.8)
Education		
High school diploma or less	Reference	Reference
At least some college	0.7 (0.4, 1.0)	1.0 (0.6, 1.5)
Parity:		
0 children	Reference	Reference
1 or 2 children	1.5 (0.4, 6.0)	1.5 (0.4, 6.5)
3 or more children	2.5 (0.6, 10.5)	2.4 (0.5, 11.3)
Marital status:		
Ever been married	Reference	Reference
Never been married	1.8 (1.1, 3.0)	1.4 (0.8, 2.3)

^aWeighted to reflect the U.S. female civilian noninstitutional population.^bAdjusted for all other covariates in the table.^cPublic insurance included Medicaid, Medicare, Medi-Gap, Indian Health Service, CHIP, state-sponsored, or other government program.^dPoverty threshold based on 2001 level defined by the U.S. Census Bureau, which takes into account total household income and number (i.e. \$18,104 for a family of four).

TABLE 3 Adjusted ORs of expressing desire for reversal stratified by age groups.^{a,b}

Variable	Age 18-30 at time of surgery (n = 561): OR and 95% CI	Age > 30 at time of surgery (n = 373): OR and 95% CI
Race/ethnicity:		
White	Reference	Reference
Hispanic	1.0 (0.6, 1.8)	1.5 (0.6, 3.4)
Black	1.1 (0.5, 2.2)	2.6 (1.2, 5.8)
Insurance status:		
Private	Reference	Reference
Public/none ^c	1.2 (0.7, 2.1)	2.5 (0.8, 8.0)
Poverty level ^d :		
<100%	Reference	Reference
100%-499%	0.8 (0.4, 1.3)	1.6 (0.4, 6.0)
>499%	0.4 (0.1, 2.7)	28.4 (6.4, 125.0)
Education:		
High school diploma or less	Reference	Reference
At least some college	0.7 (0.4, 1.4)	1.8 (0.9, 3.5)
Parity:		
0 children	Reference	Reference
1 or 2 children	1.3 (0.2, 8.7)	6.4 (0.5, 85.1)
3 or more children	2.3 (0.3, 16.2)	8.6 (0.6, 120.1)
Marital status:		
Ever been married	Reference	Reference
Never been married	1.5 (0.8, 2.7)	1.2 (0.4, 4.2)

^aWeighted to reflect the U.S. female civilian noninstitutional population.^bAdjusted for all other covariates in the table.^cPublic insurance included Medicaid, Medicare, Medi-Gap, Indian Health Service, CHIP, state-sponsored, or other government program.^dPoverty threshold based on 2001 level defined by the U.S. Census Bureau, which takes into account total household income and number (i.e., \$18,104 for a family of four).