Compliance with Semen Analysis

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Abbreviations and Acronyms
AUA = American Urological Association
PVSS = post-vasectomy semen sampling

Purpose: We calculated the compliance rate and determined which population of men would be more or less likely to be compliant with semen analysis followup based on demographic information and complication rates.

Materials and Methods: We retrospectively reviewed the records of 946 consecutive patients who underwent vasectomy at an ambulatory clinic, as performed by 1 urologist. Standard followup consisted of a telephone call or prebooked appointment 2 months after vasectomy and 2 semen analyses 4 months after vasectomy.

Results: Average ± SD patient age was 33.6 ± 5.4 years. Of the 946 study patients 47.9% did not submit a negative semen sample, 15.7% submitted 1 and 36.4% submitted the required 2 negative samples to confirm successful vasectomy according to the sampling protocol. Mean time to semen analysis was 4.53 ± 2.14 months. Complications included infection in 1.9% of cases, hematoma in 1% and sperm granuloma in 0.5%. Men 34 years or younger, men with 3 or more children and men without complications were more likely to be noncompliant with semen analysis.

Conclusions: The number of men who provided samples for semen analysis in this study was low, although they were given written and verbal reminders. This poor patient compliance is similar to that in previous studies. We identified a subset of patients with poor compliance, which may allow urologists to target preprocedure counseling more appropriately.

Key Words: testis, vasectomy, semen analysis, patient compliance, postoperative complications

VASECTOMY is a common form of birth control for many couples that has proved to be a safe, effective contraception method. Approximately 350,000 American men undergo this brief procedure annually.1 As with all procedures, surgeons cannot guarantee a 100% success rate. The vasectomy failure rate is extremely low at less than 1% but it still exists.2 For this reason men must undergo semen analysis after vasectomy to confirm sterility.

PVSS regimens vary among surgeons and have lately been controversial. Recent evidence supports a 1-sample regimen in which vasectomy is deemed successful after 1 negative semen analysis.3 The 2012 AUA guideline supports this belief that better compliance is achieved by a 1-sample regimen. The guideline calls for a single sample to be submitted between 8 and 16 weeks after vasectomy.4 If the sample shows azoospermia or rare nonmotile sperm (fewer than 100,000 sperm per ml), the patient can abandon alternate forms of contraception. Despite this evidence and a recent change in the guidelines, many surgeons still prefer the conventional 2 consecutive negative samples before considering a patient sterile.
Patient compliance with PVSS is astonishingly low.5–8 Many studies indicate that patient compliance with PVSS decreases as the number of samples required increases. To date only Sheynkin et al have investigated sociodemographic predictors of PVSS compliance.5 In 2009 they reported that PVSS non-compliance was associated with fathering 4 or more children, smoking and a lower educational level.

We calculated the PVSS compliance rate in a defined patient population. We also determined which population of men would be more or less likely to comply with PVSS based on demographic information and complication rates.

MATERIALS AND METHODS

Procedure

After receiving institutional ethics board approval, we reviewed the charts of 946 consecutive men who underwent vasectomy at a single institution, as performed by a single surgeon (TW) between January 2002 and December 2009.

At the vasectomy consultation visit the procedure, risks and complications were discussed along with the PVSS regimen. The regimen involved collecting 2 semen samples submitted less than 2 hours after ejaculation at 16 weeks after vasectomy. During vasectomy, this information was reiterated and written instructions for PVSS were provided after the procedure.

A no scalpel, 2-incision technique was used for all 946 vasectomies with the patient under local anesthesia. A piece of vas of approximately 1 cm was removed for pathological study. The vas lumen was cauterized, and the proximal and distal ends were secured with titanium clips.

Patients were given specimen containers with written instructions at vasectomy or 2 months postoperatively. Therefore, they were informed 2 or 3 times about the importance of PVSS and its timing.

Analysis

We reviewed the charts of 946 men treated with vasectomy. A database was constructed containing certain variables, including patient age at vasectomy, marital status, number of children before the procedure, presence/absence of complications, time to semen analysis and number of negative samples provided. The database was used to gather demographic information on the patient population and determine whether any recorded variables correlated with poor compliance with PVSS.

Pearson chi-square analysis was used to test for a statistical correlation between recorded variables and PVSS compliance. Logistic regression analysis was used to determine which factors predicted noncompliance.

RESULTS

Descriptive Statistics

During the study period, vasectomy was performed in 946 men with a mean ± SD age of 33.6 ± 5.41 years (range 21 to 54). The men had a mean of 2.15 ± 0.91 children (range 0 to 7) before vasectomy. Mean time to semen analysis in those who provided samples was 4.53 ± 2.14 months (range 1 to 27). Of the men 785 (83%) were married, 103 (11%) were common law married and 58 (6%) were single or divorced. The complication rate in this study was 3.4%. Recorded complications include infection in 19 cases, hematoma in 10 and sperm granuloma in 5. Vasectomy was repeated in 4 men, including 1 with motile sperm. The other 3 repeat vasectomies were performed at patient request for persistent rare non-motile sperm.

PVSS Compliance

Of the 946 study patients 453 (47.9%) submitted no semen sample, 149 (15.7%) submitted only 1 negative sample and 334 (36.4%) complied with the PVSS regimen by submitting 2 negative samples.

Variable Specific Correlations

Using the database that we developed, statistical analyses were performed to compare compliance in men who 1) were 35 years or older vs 34 or younger, 2) had 3 or more vs 2 or fewer children, 3) did vs did not have complications and 4) were married/common law married vs unmarried. Results revealed that men 34 years old or younger (chi-square = 5.72, p = 0.02), with 3 or more children (chi-square = 6.49, p = 0.01) and without complications (chi-square = 4.99, p = 0.03) were more likely to be noncompliant (see figure). There was no statistically
significant difference in compliance based on marital status in the 946 men (chi-square = 1.21, p = 0.27, see figure).

Logistic Regression Analysis
Logistic regression analysis results indicated that the number of children was a significant factor in noncompliance with compliance decreasing as the number of children increased (p = 0.03, 95% CI 0.73–0.98). For this analysis age was divided into groups to determine approximately what age group had the greatest noncompliance. The final groups were younger than 30, 30 to 34, 35 to 39 and 40 years old or older. Results indicated that age 30 to 34 years was the only significant factor for noncompliance (p = 0.03, 95% CI 0.48–0.96). Analysis confirmed the lack of impact of marital status on compliance (p = 0.62, 95% CI 0.66–1.99).

DISCUSSION
PVSS is an essential step to determine vasectomy success. Without these results, surgeons cannot deem patients sterile and, therefore, are at risk for litigation in the event of an unplanned pregnancy. The number of men who did not provide a single semen sample in this study is alarmingly high. Almost half of the men in this relatively large study group of 946 did not submit a semen sample after vasectomy. The other half included those who submitted at least 1 negative sample.

Conventionally, 2 negative samples are collected for semen analysis but there has been recent debate in the literature whether this is necessary. Several groups questioned the need for 2 samples, arguing that compliance was better with a 1-sample regimen.3,9,10 Notably, if we had followed a 1-sample regimen, we still would have achieved only 52.1% compliance (at least 1 negative sample) compared to 36.4% (2 negative samples).

As stated, the AUA recently published a guideline to reflect these findings in the literature. Compliance may have been better in this patient population if the AUA guideline had been used. In fact, the 3 men who underwent repeat vasectomy for persistent rare motile sperm may have been convinced that it was unnecessary.

The AUA guideline also recommends vas occlusion techniques, acknowledging that the vas occlusion literature shows serious methodical flaws.4 For this reason the AUA granted only grade C level of evidence on this topic, recommending techniques that produce consistent findings, such as a low failure rate across multiple large studies. The 4 recommended techniques are 1) mucosal cautery with fascial interposition, 2) mucosal cautery without fascial interposition, 3) open-ended vasectomy that leaves the testicular end of the vas unoccluded with mucosal cautery used on the abdominal end with fascial interposition and 4) the nondivision method of extended electrocautery. Studies of ligation and clip techniques for vas occlusion showed a failure rate as high 5.85%11 and 8.67%,12 respectively. The AUA presents them as optional techniques for surgeons with training in and/or experience with the procedure. As stated, vasectomy was repeated in 4 men in our study group for whom semen analysis was available. Perhaps modifying our technique to a method without clips would lead to more azoospermic samples after vasectomy.

All of this makes sense intuitively. However, the point being missed is that approximately half of the men do not provide even a single sample. Perhaps it would be more beneficial to focus efforts on identifying those at risk for no compliance and counsel them better preoperatively.

In the second component of our study we highlighted particular patient populations at high risk for noncompliance. A previous group identified worse PVSS compliance in men with 4 or more children, men who smoke and men with a lower educational level.5 In our study population men with 2 or fewer children, men 35 years old or older and men with complications were most compliant with semen analysis. Their counterparts with 3 or more children, those younger than 35 years and those without complications were less compliant.

Interestingly, marital status did not correlate with the compliance rate even with the greater power of more patients in our study than in that of Sheynkin et al.5 Although measured variables differ somewhat between these series, some similarities were observed. Marital status appeared to have no role in predicting compliance with semen analysis. Also, as the number of children increased (4 or more in the series by Sheykin et al vs 3 or more in ours), patient compliance with semen analysis decreased. Unlike in previous studies, age was a predictive factor for noncompliance with men 30 to 34 years old least compliant with semen analysis.

Several hypotheses were proposed to help explain poor compliance after vasectomy, including aversion to masturbation, being quoted a failure rate of less than 1%, confidence in the surgeon, fear of the result and lack of understanding the PVSS regimen.6,13 To our knowledge it is unknown whether 1 factor or a combination of several factors is more common. Nevertheless, PVSS compliance rates are strikingly low in our study and in the literature.5–8

Although this study group was relatively large compared to those in the literature, we could only compare the variables recorded in the database. Ideally, we would initiate a prospective study to gather
more detailed information at the vasectomy consultation session, such as patient occupation, smoking habit, educational level, when the last child was born and how long the patient has been considering vasectomy. After we confidently identify a population at risk, we can tailor our preoperative counseling accordingly to ensure optimum compliance with PVSS.

CONCLUSIONS
Study patient compliance with semen analysis after vasectomy was astonishingly low. Many men did not provide a single sample, let alone the 1 or 2 negative samples required to confirm sterility. As urologists, we must attempt to identify these men and modify our preoperative counseling accordingly to avoid potential litigation from unplanned pregnancies.

REFERENCES


