

Sexual dysfunction in men undergoing infertility evaluation: a cohort observational study

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Objective: To study psychosexual problems in men undergoing infertility evaluation.

Design: A cohort observational study.

Setting: Male infertility diagnostic center.

Patient(s): Four hundred twelve men undergoing infertility evaluation between 1999 and 2001.

Intervention(s): Baseline and follow-up data on sexual functions. Semen analysis for samples collected by masturbation. A second analysis was requested in 2 weeks upon finding an abnormality of semen parameters. Penile vibratory stimulation to help men who failed to collect semen on their second or subsequent appointments.

Main Outcome Measure(s): Sexual functions (erection and orgasm) during the time of infertility evaluation.

Result(s): Seven of 412 men were excluded from the analysis due to a past history of sexual dysfunction. Of the remaining 405 men, 46 (11%) failed to collect semen by masturbation for a second semen analysis after repeated (2–4 times) attempts at 2- to 3-day intervals. Nine of these men (20%) were able to collect semen using vibratory stimulation. All 46 men experienced problems with erection or orgasm and had severe anxiety during attempts to masturbate and during sexual contact with their partners.

Conclusion(s): Our study indicates that some men may experience sexual dysfunction of a psychogenic nature in response to the diagnosis of infertility. (Fertil Steril® 2003;79:909–12. ©2003 by American Society for Reproductive Medicine.)

Key Words: Anxiety, male infertility, semen analysis, sexual dysfunction

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In recent years, infertility has become the subject of significant media attention and public discussion, particularly in light of new advances in the technology of assisted reproduction (1). Issues related to infertility have a significant impact, not only on the health and well being of affected individuals or couples, but also on society as a whole (2). Infertility has been correlated with psychological stress, at least for some individuals (3). Psychological effects of infertility were found similar to those of cancer and heart diseases (4). However, there is little agreement in the experimental and anecdotal literature concerning the nature, timing, and the extent of the emotional strain as a result of infertility (5).

Male factor infertility plays a role in approximately 50% of infertility cases (6) with male

factor as a sole cause in about 35% (7). Some studies have suggested that infertile men experience fewer disturbances than women on various indices of emotional functions (8, 9). Whether this observation is due to a general tendency for men to underreport their emotional responses is not clear (4). Nevertheless, the few studies that examined the effects of a gender-specific diagnosis indicated that a fertility problem, which lies solely on the male partner, inflicts a particular psychological burden (10, 11). In addition, the incidence of depression significantly increased among men who were solely responsible for the infertility status compared with men who were either fertile or shared the problem with their partners (11).

It has been proposed that a man who fails at fertility is likely to evaluate himself as sexually

inadequate and may experience temporary impotence (12) and decreased libido (13). Constant worry about the problem may arouse inhibitory nerves and interfere with smooth muscle relaxation in the penis, thus causing partial or complete failure of erection (14). Whether sexual performance in men undergoing initial infertility evaluation is negatively affected by abnormal results of their laboratory workup is not known. This information is important because it will help determine whether appropriate counseling should be provided to these men. Therefore, the objective of this study was to examine sexual functions of men undergoing infertility evaluation at a male infertility diagnostic center.

MATERIALS AND METHODS

Data Collection

The institutional review board approved this study. We collected baseline and follow-up data of 412 men referred to the andrology clinic for a history of primary infertility of more than 12 months between 1999 and 2001. These patients were diagnosed with male factor infertility based on the finding of abnormal semen analysis. Data included medical and sexual history and results of standard semen analysis.

Sexual Function Data

Assessment of baseline sexual functions (erection and orgasm) of all participants was performed using an abridged, five-item version of the International Index of Erectile Function (IIEF-5) (15, 16). The IIEF-5 questionnaire form is a simple and reliable diagnostic tool for direct assessment of male sexual functions, namely erection and orgasm (15). The response to each of the five questions was ranked from 1 (almost never/never) to 5 (almost always/always). The total IIEF-5 score was calculated as the sum of responses to the five items; thus, the score ranges from 5 to 25. Follow-up assessment of sexual functions was performed in men who failed to collect semen on their second or subsequent appointments. The items of the IIEF-5 questionnaire form were modified to provide information on sexual activity (erection and orgasm) during masturbation as well as sexual intercourse. We compared baseline vs. follow-up IIEF-Scores in the later group.

Semen Analysis

All subjects were asked to collect semen by masturbation for initial fertility evaluation after failure to initiate natural pregnancy after 1 year of natural intercourse. Semen specimens were collected in a private room near the laboratory after a period of 48 to 72 hours of sexual abstinence. Standard semen analysis was performed according to the World Health Organization guidelines (17) to determine sperm concentration and motility. Smears were prepared for assessment of sperm morphology using the World Health Organization classification (17). Normal values for standard sperm parameters were considered as sperm concentration $\geq 20 \times 10^6/\text{mL}$ of semen, percent motility $\geq 50\%$, and percent nor-

mal sperm forms $\geq 30\%$ (17). Our study included men who had an abnormality in one or more of abnormal standard semen parameters in their first semen analysis.

Study Groups

Individuals with a total baseline IIEF-5 score of less than 20 ($n = 7$) were excluded from the study because their sexual functions were already impaired. The remaining 98% (405/412) of patients had normal sexual functions (a total IIEF-5 score ≥ 20) and were able to collect the first semen sample by masturbation without difficulty. Patients were informed that they had abnormal semen analysis results, and scheduled for a second semen analysis in 2 weeks. Of the 405 patients, 46 (11%) failed to collect semen by masturbation for the second analysis (group 1), whereas the remaining 359 (89%) patients had no difficulty in collecting semen (group 2).

Patients in group 1 ($n = 46$) were scheduled for subsequent attempts of semen collection, by masturbation, at 2- to 3-day intervals (2 to 4 attempts/patient). Patients were also given the option of collecting the samples at home, by masturbation, or during sexual intercourse with their partners (coitus interruptus) and to deliver the sample to the laboratory within 1 hour of collection. Patients who failed to collect semen after two to four attempts by masturbation and coitus interruptus (group 1) were aided by vibratory stimulation. This was performed using a mechanical vibrator applied to the undersurface of the glans penis and set to vibrate at a designated frequency and wave amplitude to give a strong, prolonged stimulus. Only 9 patients of the 46 were responsive to the vibratory stimulation and could collect a sample (group 1a), whereas the remaining patients could not do so (group 1b).

Statistical Analysis

Univariate comparison of continuous variables between the groups was performed with Kruskal-Wallis tests. Wilcoxon rank-sum tests were used for pairwise comparisons between the groups. Fisher's exact test was used for categorical variables. Multivariate analyses were performed with logistic regression. No confounding variables were detected. All hypothesis testing was two-tailed with statistical significance assessed at $P < .05$ level.

All analyses were conducted with SAS statistical software package (version 8.1 SAS Institute Inc., Cary, NC). Summary statistics are presented as mean (\pm SD) for IIEF-5 scores, and median (25th, 75th percentiles) for other variables.

RESULTS

Patients in group 1 had an IIEF-5 score of 11.2 ± 2.6 during the follow-up period which was significantly lower than the baseline score (22.6 ± 2.3) ($P < .01$). Patient's age, length of infertility and results of semen analysis from initial collection in groups 1 and 2 are shown in Table 1. The length

TABLE 1

Comparison of patient's age, length of infertility, and results of semen analysis from initial collection between groups 1 and 2.

Variable	Group 1 (n = 46)	Group 2 (n = 359)	P value
Age (y)	32 (27, 35)	30 (27, 34)	.17
Length of infertility (y)	2.2 (1.5, 3.8)	1.3 (1, 2.4)	.02
Sperm concentration ($\times 10^6/\text{mL}$)	9 (1, 82)	33 (6, 88)	.06
Motility (%)	41 (0, 53)	48 (25, 58)	.05
Normal sperm forms (%)	13 (4, 32)	22 (8, 40)	.08

Group 1 = men who failed to collect a sample for second semen analysis. Group 2 = men who were able to collect a sample for second semen analysis. Values are median and interquartile range (25th and 75th percentiles). Wilcoxon rank-sum test was used for the analysis and $P < .05$ was significant.

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of infertility in group 1 was significantly greater than group 2 ($P < .02$). Sperm motility in group 1 was significantly lower than in group 2 ($P < .04$). Sperm concentration and percent normal sperm forms in group 1 were lower than in group 2, but the differences did not reach a statistical significance ($P = .06$ and $.08$, respectively). No significant differences were observed between the two groups in the patient's age ($P = .17$).

Patient's age, length of infertility and results of semen analysis from initial collection in groups 1a and 1b are demonstrated in Table 2. Sperm concentration and motility in group 1a were significantly lower than in group 1b ($P < .04$ and $P < .01$, respectively). Percent normal sperm forms in group 1a was lower than in group 1b, but did not reach statistical significance ($P = .05$). No significant differences were observed between the two groups in the patient's age or

TABLE 2

Comparison of patient's age, length of infertility, and results of semen analysis from initial collection between groups 1a and 1b.

Variable	Group 1a (n = 9)	Group 1b (n = 37)	P value
Age (y)	29 (27, 34)	32 (29, 35)	.39
Length of infertility (y)	2.5 (1.7, 3.8)	1.9 (1.5, 2.9)	.19
Sperm concentration ($\times 10^6/\text{mL}$)	74 (53, 83)	4 (0.5, 49)	.04
Motility (%)	58 (48, 61)	35 (0, 49)	.01
Normal sperm forms (%)	22 (9, 34)	11 (2, 29)	.05

Group 1a = men who responded to vibratory stimulation. Group 1b = men who did not respond to vibratory stimulation. Values are median and interquartile range (25th and 75th percentiles). Wilcoxon rank-sum test was used for the analysis and $P < .05$ was significant.

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the length of infertility ($P = .4$ and $.2$, respectively). All 46 patients who failed to collect semen specimen by masturbation or during sexual contact with their partners reported severe anxiety.

DISCUSSION

Infertility is an emotional crisis and a physical challenge because it interferes with one of the most fundamental human activities (18). From a list of 87 items of stressful life events, infertility has been ranked as one of the most negative stressful situations—akin to the death of a son or a spouse (19). In this study, 11% (46/405) of men undergoing infertility evaluation experienced problems with erection or orgasm after detection of an abnormality in the results of their first semen analysis. Because these men had normal sexual functions before the infertility evaluation, we speculate that erectile dysfunction in these cases was psychogenic in nature and was triggered by the abnormal results of semen analysis. The psychogenic nature of erectile dysfunction in these patients was also evident from its association with a longer duration of infertility and with increased levels of anxiety.

Our study indicates that sperm parameters are significantly lower among men who experience sexual dysfunction. This may reflect an adverse emotional reaction to severe abnormalities of sperm production. Our finding is in agreement with an earlier report that men experience greater distress when an identifiable cause for the failure to conceive lies in a problem with sperm production (11). Some investigators have claimed that the link between fertility and potency is particularly strong and that the capacity to procreate is essential to the male identity (10, 20). Before a conclusion can be reached from the findings of our study, it is important to bear in mind certain study limitations. First, although this study interprets the findings within a theoretically causal framework, the speculation of a causal relationship between infertility and sexual dysfunction should be treated with some caution due to the retrospective nature of the study. In this regard, a prospective, longitudinal design would better address the issue of a possible causal relationship between these two variables.

Second, it is not possible to say whether the sample is representative of infertile men in general. Men attending an infertility clinic may differ from those who refuse to seek medical help for infertility. Finally, it was not possible to obtain complete information about the psychological profiles of the study participants or their partners. As a result, we were unable to identify other potential psychological disturbances in the infertile men who experienced erectile dysfunction or even in the remaining population who had a normal sexual function. Despite these reservations, the interesting findings in our study bring to light certain facts regarding the lack of psychological readiness of men under-

going fertility evaluation to accept and properly face their infertility status.

In addition, the results of our study identify the need for psychological counseling for infertile men in parallel with medical assistance. Appropriate counseling may help reduce anxiety among infertile men by addressing some key issues pertinent to men (5). For instance, it may be appropriate to challenge the link between fertility and sexuality. This may help to better psychologically adjust throughout the prolonged course of investigation and treatment. In conclusion, our study indicates that some men may experience sexual dysfunction of a psychogenic nature in response to the diagnosis of infertility. We recommend that infertility programs develop a multidisciplinary team approach including psychologists and psychiatrists specializing in the emotional effects of infertility to help patients cope with the emotional aspects of infertility.

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