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## **The Assessment of Sexual Functions in Women with Male Partners Complaining of Erectile Dysfunction: Does Treatment of Male Sexual Dysfunction Improve Female Partner's Sexual Functions?**

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*The aims of this prospective study were to compare sexual functioning between women with male partners who have erectile dysfunction (ED) and women without partners with ED and also to investigate the effect of the treatment of male ED on female partner's sexual function. The study included 87 women and their male partners. We divided the women into two groups: 38 women with male partners complaining of ED (ED group) and 49 women with male partners who have no ED (control group). Of the men with ED, 30 were treated with penile prosthesis implantation (n = 17) or oral sildenafil citrate (n = 13). We evaluated all the men with the International Index of Erectile Function (IIEF; Rosen, Cappelleri, Smith, Lipsky, & Pena, 1999), physical examination, and color penile Doppler ultrasound. We evaluated female sexual function with the Female Sexual Function Index (FSFI; Rosen et al., 2000) to assess sexual desire, arousal, lubrication, orgasm, satisfaction, and pain. We compared female sexual function scores between the women of the male partners with and without ED and also compared before both groups and after the treatment of male partners in the ED group. Additionally, we compare the scores according to the type of treatment given to the male partners. Sexual arousal (p = 0.009), lubrication (p = 0.001), orgasm (p = 0.006), satisfaction (p = 0.000), pain (p = 0.039), and total score (p = 0.003) were highly significantly lower in the ED group than in the control group,*

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*although sexual desire did not differ between the two groups ( $p = 0.515$ ). We investigated the effect of male ED on female sexual functions and found no statistically significant differences in the presence of organic type impotence, older age, and lower erection scores on the IIEF ( $p = 0.53$ ,  $p = 0.15$ , and  $p = 0.1$ , respectively). After the treatment of male ED, we observed significant improvement in sexual arousal ( $p = 0.001$ ), lubrication ( $p = 0.002$ ), orgasm ( $p = 0.000$ ), satisfaction ( $p = 0.000$ ), and pain ( $p = 0.002$ ) in the women. These findings suggest that female sexual function is affected by male erection status and may improve after the treatment of male sexual dysfunction.*

Female sexual dysfunction occurs in 25% to 63% of women, and the risk increases with age (Çayan et al., 2004; Frank, Anderson, & Rubinstein, 1978; Goldmeier, Judd, & Shroeder, 1998; Laumann, Paik, & Rosen, 1999; Rosen, Taylor, Leiblum, & Bachmann, 1993; Spector & Carey, 1990). Female sexual functions may be affected by various factors, including age, education, depression, history of sexual abuse or sexually transmitted disease, emotional or stress-related problems, chronic diseases, multiparity, menopause, and health status (Berman, Adhikari, & Goldstein, 2000; Çayan et al., 2004; Erol et al., 2003; Goldstein, 2000; Laumann et al. 1999; Roose, Glassman, & Seidman, 2001; Rosen et al., 1993; Rothschild, 2001). Another factor could be sexual dysfunction in a partner.

The effects of male sexual dysfunction on a female partner's sexual function has not been extensively assessed. We hypothesized that male erection problems may have a negative effect on a female partner's sexual function; the treatment of male ED may improve sexual functions of the female partner. Therefore, the aims of this prospective study were to evaluate sexual function in women with male partners who have ED and to investigate whether there are differences in sexual function between women with male partners complaining of ED and women with male partners who have no erection problem. We also investigated the effect of the treatment of male ED on the female partner's sexual function.

## SUBJECTS AND METHODS

This prospective study consisted of 87 women and their male partners. The women were divided into two groups: 38 women with male partners who have ED (ED group), and 49 women with male partners who have no ED (control group). All women and their partners were sexually active. Participants who had no sexual activity within the past month were not included in

the study. The ED group consisted of women with male partners complaining of inability to achieve or maintain erection enabling sexual intercourse, as described by the NIH Consensus Development Panel on Impotence (National Institute of Health, 1993). The control group consisted of women with healthy men who had no sexual dysfunction.

We evaluated all the men enrolled in the study by taking a detailed history, administering the International Index of Erectile Function (IIEF; Rosen, Cappelleri, Smith, Lipsky, & Pena, 1999) and conducting a physical examination. The male physical examination also included assessment of the size and consistency of testis, evaluation of body hair distribution, presence of Peyronie's disease, and gynecomasty. Male partners older than 45 years were also evaluated with a digital rectal examination and serum prostatic-specific antigen level test. We also recorded demographic characteristics and laboratory findings for all the men. We evaluated the etiology of ED by taking a detailed history, conducting an intracavernosal injection test, and using penile Doppler ultrasound, if necessary. The men with a nonresponse to the intracavernosal injection test or an abnormal vascular system on penile Doppler ultrasound were considered as organic-type ED. Of the men with ED, 30 were treated. However, 8 men and their partners could not be included in the study because they either did not accept the treatment or their female partners were unable to undergo posttreatment evaluation to assess sexual functions. To treat the ED, 17 men underwent a three-piece Alpha-1 inflatable penile prosthesis implantation (Mentor Corp., Santa Barbara, California, USA), and 13 men underwent treatment with oral sildenafil citrate.

We assessed female sexual functions in the women with male partners treated for ED before and after at least 3 months of the treatment. We evaluated female sexual function using a detailed 19-item questionnaire, the Female Sexual Function Index (FSFI; Rosen et al., 2000) that measure sexual desire (score range 2 to 10), arousal (score range 0 to 20), lubrication (score range 0 to 20), orgasm (score range 0 to 15), satisfaction (score range 2 to 15), and pain (score range 0 to 15). We compared female sexual function scores between the women with male partners with ED women with male partners without ED and also compared scores before and after the treatment of the male partners in the ED group.

We performed statistical analyses using Statistical Package for the Social Sciences (SPSS version 9.0, SPSS, Inc., Chicago, IL). We used the independent *t*-test to compare parametric female sexual function scores and performed univariate analysis to investigate whether there were risk factors for male ED that may predict a female partner's sexual dysfunction. We used the paired *t*-test to compare female sexual function scores before and after the treatment of the male partner's ED. Probability values of  $<0.05$  were considered significant. The values are given as the mean  $\pm$  standard deviation (*SD*).

**TABLE 1.** The Mean Female Sexual Function Scores for Each Domain and Total Score of the Women Between Erectile Dysfunction (ED) and Control Groups

Female sexual function domains	Erectile dysfunction group ( $n = 38$ )	Control group ( $n = 49$ )	<i>P</i> value
Desire	5.3 ± 2	5 ± 2.1	0.515
Arousal	9.2 ± 5.5	12.2 ± 4.7	0.009
Lubrication	10.2 ± 6.1	14.3 ± 4.8	0.001
Orgasm	6.9 ± 4.5	9.5 ± 3.9	0.006
Satisfaction	6.6 ± 4	10.3 ± 3.8	0.000
Pain	9.1 ± 5.7	11.4 ± 3.7	0.039
Total score	18 ± 7.7	23 ± 7.3	0.003

## RESULTS

The mean age of the female partners was  $43.8 \pm 10.7$  years in the ED group and  $39.1 \pm 11.1$  years in the control group, revealing no statistically significant difference ( $p = 0.151$ ). The mean age of the male partners was  $48.8 \pm 11.9$  years in the ED group and  $46.9 \pm 8.9$  years in the control group, revealing no statistically significant difference ( $p = 0.542$ ). Table 1 shows the mean female sexual function scores for each domain and the total score of the women for the ED and the control groups. Although sexual desire did not differ between the two groups ( $p = 0.515$ ), sexual arousal ( $p = 0.009$ ), lubrication ( $p = 0.001$ ), orgasm ( $p = 0.006$ ), satisfaction ( $p = 0.000$ ), pain ( $p = 0.039$ ), and total score ( $p = 0.003$ ) were highly significantly lower in the ED group than in the control group.

We observed no statistically significant differences for presence of organic type impotence, older age, and lower erection score on the IIEF ( $p = 0.53$ ,  $p = 0.15$ , and  $p = 0.1$ , respectively).

The mean duration to assess female sexual functions after the male partners' treatment was  $8.6 \pm 7.4$  (3–24) months. The mean sexual function scores for the female partners of ED men before and after the treatment are given in Table 2. Although sexual desire did not differ before and after the treatment of male ED ( $p = 0.751$ ), highly significant improvement was observed in sexual arousal ( $p = 0.001$ ), lubrication ( $p = 0.002$ ), orgasm ( $p = 0.000$ ), satisfaction ( $p = 0.000$ ), and pain ( $p = 0.002$ ) after treatment. In addition, the total sexual function score of the women increased from  $18.5 \pm 7.7$  to  $24.5 \pm 5.3$  after the treatment, revealing a highly significant difference ( $p = 0.000$ ).

## DISCUSSION

Our previous study and other studies have demonstrated that female sexual dysfunction, including desire, arousal, lubrication, orgasm, satisfaction, and pain problems, is a highly prevalent health problem that increases with age. The prevalence of female sexual dysfunction has been reported as 25% to

**TABLE 2.** The Mean Female Sexual Function Scores for Each Domain and Total Score of the Women Before and After the Treatment of Male Partners Erectile Dysfunction (ED)

Female sexual functions	Before treatment of male ED ( <i>n</i> = 30)	After treatment of male ED ( <i>n</i> = 30)	<i>P</i> value
Desire	5.4 ± 1.9	5.3 ± 1.8	0.751
Arousal	10.1 ± 4.5	13.3 ± 3	0.001
Lubrication	10.8 ± 6.4	14.3 ± 4.3	0.002
Orgasm	6.7 ± 4.2	10 ± 3.1	0.000
Satisfaction	6.6 ± 4	10.4 ± 2.8	0.000
Pain	9.4 ± 5.6	12.1 ± 2.9	0.002
Total score	18.5 ± 7.7	24.5 ± 5.3	0.000

63% (Çayan et al., 2004; Frank et al., 1978; Goldmeier et al., 1998; Laumann et al., 1999; Rosen et al., 1993; Spector & Carey, 1990). Lower educational levels, unemployment, depression, history of sexual abuse or sexually transmitted disease, emotional or stress-related problems, chronic diseases, multiparity and menopause are important risk factors for sexual dysfunction (Berman et al., 2000; Çayan et al., 2004; Erol et al., 2002; Goldstein, 2000; Laumann et al., 1999; Roose et al., 2001; Rosen et al., 1993; Rothschild, 2001). In addition, the presence of male partner's ED has been found to be a risk factor for female sexual dysfunction. Derogatis, Meyer, and Gallant (1977) reported that female partners of men who present with sexual dysfunction had significantly lower sex drive and were more restricted in their range of sexual activities than were other women. Renshaw (1981) found the prevalence of sexual difficulties, including orgasmic dysfunction, vaginismus, dyspareunia, and reduced sexual interest, to be as high as 62% in female partners of men with ED. However, to our knowledge, no study has assessed the effect of male sexual dysfunction on female partner's sexual functions as a comparative study, using the FSFI. We found highly significantly lower sexual arousal, lubrication, orgasm, and satisfaction and a higher prevalence of dyspareunia in the women with male partners complaining of ED than in the control group, although sexual desire did not differ between the two groups. A higher prevalence of relationship problems has been reported in men with presumed nonorganic ED than in men with organic ED (Speckens, Hengeveld, Lycklama a Nijeholt, van Hemert, & Hawton, 1995). However, we observed no risk factors, such as the type of impotence, age, and lower erection scores on the IIEF by the male partners, that might be linked female sexual dysfunction. These results suggest that female sexual dysfunction is commonly seen in women with male partners who have ED, and female sexual functions may be affected by male erection status. Therefore, male partners should be assessed for sexual function problems when female partners are evaluated for sexual dysfunction.

Advances in the treatment of male erectile dysfunction have improved functioning for most men complaining of erection problems. Male sexual

dysfunction may be corrected with oral drugs (Goldstein et al., 1998; Lewis et al., 2001; Paige, Hays, Litwin, Rajfer, & Shapiro, 2001), with intracavernosal injection and intraurethral therapy (Althof et al., 1992; Shabsigh et al., 2000), with surgical therapy (Goldstein et al., 1997; Montorsi et al., 2000; Mulhall, Ahmed, Branch, & Parker, 2003), or with a vacuum constriction device and sex therapy (Wylie, Jones, & Walters, 2003). Riley (2002) reviewed the role of the partner in the etiology, assessment, and treatment of male ED. With the many treatment options available for male ED, satisfaction with treatment by both patients and their partners is an important consideration in maintaining treatment regimens.

In past, patient and partner satisfaction has been assessed using various questionnaires (Althof et al., 1999; Mathias et al., 1999). Using the Erectile Dysfunction Inventory of treatment satisfaction (EDITS) questionnaire (Althof et al., 1999), Lewis et al. (2001) determined that patients receiving sildenafil and their partners both had significantly higher treatment satisfaction scores than those receiving placebo. They concluded that treatment with sildenafil significantly reduces concerns among patients about erection problems. In a study done by Paige et al. (2001), sildenafil users reported significant improvements in erectile and sexual function, which were associated with positive changes in emotional wellbeing and relationship with sexual partner. Using psychometric questionnaires and clinical interviews, Althof et al. (1992) compared the sexual, marital, and psychological responses of women to their partner's use of intracavernosal self-injection therapy and vacuum tumescence therapy for ED. They demonstrated significant increases in frequency of intercourse, sexual arousal, coital orgasm, and sexual satisfaction with both treatments, although they noted no significant changes on the psychometric questionnaires. They concluded that self-injection and vacuum pump therapy restore potency in men and secondarily facilitate improved sexual function in women. In the present study, total sexual function score of the women highly significantly increased after the treatment. We also found highly significant improvement in sexual arousal, lubrication, orgasm, satisfaction, and pain after the treatment of male ED with oral sildenafil or penile prosthesis implantation. Therefore, our results suggest that female sexual functions may improve after the treatment of male partners with ED.

## CONCLUSIONS

These data show that female sexual dysfunction is commonly seen in women with male partners who have ED. Female sexual functions may be affected by male erection status. Therefore, male partners should be assessed for sexual function problems when female partners are treated for sexual dysfunction. In addition, female sexual functions, including sexual arousal, lubrication,

orgasm, satisfaction, and pain, may improve after male partner's treatment with oral sildenafil or penile prosthesis implantation. However, further studies with more subjects are needed to clarify the effect and treatment of male sexual dysfunction on female partner's sexual functions.

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