

ORIGINAL RESEARCH—PAIN

Psychosexual Characteristics of Vestibulodynia Couples: Partner Solicitousness and Hostility are Associated with Pain

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ABSTRACT

Introduction. Provoked vestibulodynia is a prevalent yet misunderstood women's sexual health issue. In particular, data concerning relationship characteristics and psychosexual functioning of partners of these women are scarce. Moreover, no research to date has examined the role of the partner in vestibulodynia.

Aims. This study aimed to characterize and compare the psychosexual profiles of women with vestibulodynia and their partners, in addition to exploring whether partner-related variables correlated with women's pain and associated psychosexual functioning.

Methods. Forty-three couples in which the woman suffered from vestibulodynia completed self-report questionnaires focusing on their sexual functioning, dyadic adjustment, and psychological adjustment. Women were diagnosed using the cotton-swab test during a standardized gynecological examination. They also took part in a structured interview during which they were asked about their pain during intercourse and frequency of intercourse. They also completed a questionnaire about their perceptions of their partners' responses to the pain.

Main Outcome Measures. Dependent measures for both members of the couple included the Sexual History Form, the Locke-Wallace Marital Adjustment Scale and the Brief Symptom Inventory. Women completed a horizontal analog scale assessing the intensity of their pain during intercourse and reported their frequency of intercourse per month.

Results. Findings show that women with vestibulodynia and their partners did not differ from population norms with regard to global sexual functioning, dyadic adjustment and psychological adjustment. However, mean frequency of intercourse was lower than the standard for this age group. Also, women had significantly poorer sexual functioning than men. In addition, a regression analysis revealed that partner solicitousness and hostility were significantly associated with higher levels of pain during intercourse.

Conclusions. Results suggest that although the psychosexual and relationship characteristics of partners of women with vestibulodynia are within norms, their responses may play a role in the experience of pain. **Desrosiers M, Bergeron S, Meana M, Leclerc B, Binik YM, and Khalifé S. Psychosexual characteristics of vestibulodynia couples: Partner solicitousness and hostility are associated with pain. J Sex Med 2008;5:418–427.**

Key Words. Vestibulodynia; Dyspareunia; Vulvodynia; Couple; Partner; Female Sexual Dysfunction

Introduction

According to the most recent definition of the International Society for the Study of Vulvovaginal Disease (ISSVD), vulvodynia consists of “vulvar discomfort, most often described as

burning pain, occurring in the absence of relevant visible findings or a specific, clinically identifiable, neurologic disorder” [1]. In 2003, the ISSVD revised its classification of vulvodynia and based it on two broad types of symptom presentations, namely localized vulvar pain, which refers to the

involvement of a portion of the vulva, and generalized vulvar pain, which concerns the entire vulva. The main subtype of localized vulvodynia is provoked vestibulodynia, formerly termed vulvar vestibulitis syndrome [1]. It is thought to be the most common cause of dyspareunia among young women [2,3]. With a prevalence rate of 12% in the general population, vestibulodynia is characterized by moderate to severe pain located in the vestibular area and is provoked by attempted vaginal penetration or other activities involving pressure to the vestibule (e.g., tampon insertion, gynaecological examination, etc.) [4,5].

In spite of increasing research efforts aimed at understanding the mechanisms underlying the development of vestibulodynia, its etiology remains unknown. Nonetheless, researchers have begun to document its negative impact on women's psychosexual functioning. Indeed, women with vestibulodynia have reported reductions in their sexual desire, arousal and frequency of intercourse, difficulties reaching orgasm, and negative emotions during sex [6–8]. Reports of psychological distress have been inconsistent across studies, with a majority indicating that there is no difference between women with and without vestibulodynia [9,10]. Also, women with vestibulodynia have not reported poorer dyadic adjustment than controls [6,10]. However, data on relationship characteristics and/or psychosexual functioning of partners are scarce, with only one published study to date focusing on these issues. van Lankveld and his collaborators established the psychosexual profiles of 43 women with vestibulodynia and their partners and compared them with existing norms. Results indicate that partners were satisfied with their romantic relationships and that they had little sexuality-related distress. The potential impact of the partner on the woman's pain experience was not evaluated in this study [7]. Whereas the role of the partner in the experience of other types of pain has been extensively documented, no research to date has examined the influence of the partner in vestibulodynia—a pain condition intimately linked to the presence of a significant other [11–14]. In fact, vestibulodynia may be optimally suited for the study of partner influence on pain. The significant other is the trigger of the woman's pain during intercourse and he also suffers the negative repercussions of this pain in his sex life and romantic relationship. His emotional involvement in the experience of vestibulodynia thus appears unavoidable.

In other chronic pain syndromes, partner responses to patient pain behaviors have been

identified as predictors of pain intensity [12,15–17]. Within an operant learning framework, Fordyce theorized that the spouse, being the most proximal witness of the patient's suffering, can inadvertently become a powerful reinforcement agent, thereby contributing to increases in pain and reductions in the patient's activity level [18]. Several studies focusing on significant others' responses to patients' pain have subsequently supported this operant learning model [13,19–21].

Indeed, it has been suggested that pain behavior reinforcement via demonstrations of sympathy, attention, and support from the partners increases the occurrence of these behaviors among patients [13,19,22–27]. These types of partner reactions toward the experience of the patients' pain have been termed "solicitous responses" [19]. It seems that the partner's solicitous responses are well-intended but may inadvertently contribute to the patient's avoidance of his or her usual activities and encourage passivity. In fact, patient reports of their partners' solicitous responses have been found to be positively correlated with patient pain levels and negatively correlated with their level of activity [12,16,17,22,28].

Significant others' negative responses also appear to influence the experience of individuals suffering from chronic pain. Patient evaluations of partner negative behaviors toward their pain (avoidance and critical remarks) were identified by Waltz, Kriegel, and van't Pad Bosh as related to greater pain intensity [29]. In addition, partner negative responses regarding patient pain behaviors have been shown to be related to greater psychosocial difficulties and pain-related functional deficits [12,17,30,31].

In the only study targeting the role of the romantic relationship in the experience of pain during intercourse, Meana, Binik, Khalifé, and Cohen measured anxiety, depression, and dyadic adjustment in 76 women with different types of dyspareunia. In the subgroup of 33 women with vestibulodynia, the authors found that higher dyadic adjustment was an independent predictor of lower pain intensity [32]. This finding does not corroborate what is generally observed in the field of chronic pain. The authors argued that, in the case of dyspareunia, solicitous responses were a marker for a general partner sensitivity toward the patient's pain during sexual activity that could consequently result in pain-reducing sexual behaviors. Thus, dyspareunia might be a special case of recurring pain in which the partner's

solicitude could decrease rather than increase pain [32]. However, this study did not involve the partners and included only a general measure of dyadic adjustment rather than a questionnaire focused specifically on partner responses to pain. Though the authors inferred the existence of solicitous behaviors, this variable was not measured directly.

Aims

The goals of the present study were (i) to characterize and compare the psychological characteristics, dyadic adjustment, and sexual function of women with vestibulodynia and their partners; and (ii) to explore whether partner-related variables influence women's pain and adjustment.

Methods

Participating couples were selected via a sample of women with vestibulodynia who took part in a treatment study carried out in a university health center [33]. Recruitment of the initial treatment study sample was conducted through health professional referrals and advertisements in local newspapers. For the purposes of the present study, women completed all measures at the pretreatment assessment and were asked at that time if their partners would be interested in taking part in a study concerning romantic relationships and dyspareunia. Approximately 3 months later, a research assistant communicated with the partners by telephone to confirm their interest. Of the 123 women involved in a relationship and solicited for the present study, 21 said during the pretreatment assessment that their partner would not be interested, 43 initially reported that their partners would want to participate but when contacted, the partners could not be reached or declined participation, 59 partners verbally agreed to participate and were sent the study materials by mail, and 43 actually returned their consent forms and questionnaires. The final sample size was thus comprised of 43 couples.

The inclusion criteria for the women were the following: (i) pain during sexual intercourse for at least 6 months prior to participation in the study; (ii) pain was a source of subjective distress and occurred in 75% of penetration attempts; (iii) pain was limited to sexual intercourse and other activities involving pressure to the vestibular area (e.g., bicycle); (iv) moderate to severe pain located at more than one site in the vestibular area during the cotton-swab test (see Procedure section); pain

intensity of at least 4 on a scale of 0 to 10; (v) being in an ongoing romantic relationship with the same partner since at least 6 months (as assessed during the structured interview). Exclusion criteria were the following: (i) vulvar pain unrelated to sexual intercourse or vestibular area pressure; (ii) history of dyspareunia that is currently asymptomatic; (iii) presence of one of the following problems (a) severe psychiatric or medical disorder, (b) active vaginal infection, (c) vaginismus (women unable to engage in intercourse *and* unable to undergo a gynaecological examination); (iv) being currently under treatment for dyspareunia; (v) pregnancy; (vi) being less than 18 years or more than 45 years of age. There were no specific selection criteria for the male partners. During the telephone contact, the research assistant ensured that all participating male partners had a vestibulodynia partner who was still in pain, independent of treatment status. The present study was approved by our institutional review board.

After reading and signing the consent form, the women first took part in a standardized gynecological examination to confirm their eligibility to participate in the study. During this exam, urine and vaginal cultures were obtained in order to assess the presence of urinary tract infections, Candidiasis, Gardnerella, and Trichomonas, which were exclusion criteria for this study. A Pap test was also carried out for women who did not have one in the last year. To determine the presence of vestibulodynia, a cotton-swab test was performed by the gynecologist. The reliability of the cotton-swab test and its ability to distinguish between women who suffer from vestibulodynia and those who are not affected has been well demonstrated [5]. During this test, women evaluated their pain at six different locations in the vestibular area (12, 12 to 3, 3 to 6, 6 to 9, and 9 to 12 hours) on a scale ranging from 0 to 10. Then, an average score was computed. In addition, any other physical findings were noted, as were the gynecologists' final diagnoses. A short interview concerning gynecological and obstetrical history, including painful intercourse, was conducted by the gynecologist carrying out the examination. Women who reported being unable to engage in intercourse and who could not complete the gynecological examination were excluded from the study and referred for treatment.

Following the gynecological examination, a structured interview was carried out by a trained clinical associate during which information concerning age, marital status, education, household income, mother tongue, and religious affiliation of

the women was collected. Female participants were also asked about their pain during intercourse and frequency of intercourse. In addition, they completed several standardized questionnaires at this pretreatment assessment (see Main Outcome Measures), including one about their perceptions of their partners' responses to the pain.

The subscale "partner solicitousness" of the Multidimensional Coital Pain Scale (MCPS)—a questionnaire that we developed based on the West Haven-Yale Multidimensional Pain Inventory—was completed by the women in our sample [M. Meana, Y.M. Binik, S. Bergeron, unpubl. data, 34]. It consists of 10 items assessing how women suffering from vestibulodynia perceive their partners' responses to their pain during intercourse. On a scale ranging from 0 to 10, participants evaluated the frequency with which their partners reacted in a variety of supportive ways when they experienced pain [34]. The higher the score, the more the woman perceived responses of sympathy, attention, and support from her partner during her experience of pain. The "partner solicitousness" subscale has adequate internal consistency (Cronbach's $\alpha = 0.69$) and test-retest reliability ($0.46, P < 0.0001$) [M. Meana, Y.M. Binik, S. Bergeron, unpubl. data].

Following their verbal consent during the first telephone contact, partners were mailed two copies of the consent form, an instruction sheet outlining the guidelines to follow when completing the questionnaires, the questionnaires per se, and a stamped and preaddressed envelope for the return of the package. If the research team did not receive the questionnaires after 2 weeks, a research assistant made a follow-up telephone call in order to ensure that they had received the package, to ask whether they had any questions, and to remind them to complete and mail the questionnaires. No sociodemographic information pertaining specifically to the partners was collected.

Statistical analyses were carried out using SPSS 13.0 software. First, descriptive analyses allowed us to characterize women with vestibulodynia and their partners. Independent-samples *t*-tests were then conducted to compare the psychological and dyadic adjustment and sexual function of women and men. Correlation analyses were performed in order to identify possible links between the different variables under study. Finally, a linear regression analysis was conducted to examine predictive relationships between partner-related variables and the women's pain.

Main Outcome Measures

Pain Intensity

During the structured interview, women evaluated their pain during intercourse (last 6 months) using a horizontal analog scale ranging from 0 to 10. The scale offered participants a concrete support enabling them to circle on paper the number which best corresponded to their pain intensity. The validity of this type of scale is well documented [35]. It correlates positively and significantly with other pain intensity measures [35].

Sexual Functioning

The Sexual History Form (SHF) was used in order to obtain an index of global sexual functioning of the men and women in our sample [36]. The SHF is a 28-item questionnaire commonly used to evaluate sexual desire, sexual arousal, orgasm, frequency of sexual activities, and sexual satisfaction among men and women. A global score of sexual functioning is obtained by using 12 of the 28 original items, which are representative of the multiple dimensions of sexual behavior and sexual function. A lower score indicates better sexual functioning. This global index of sexual functioning has shown good reliability and validity [37].

Dyadic Adjustment

The Locke-Wallace Marital Adjustment Scale was administered to men and women who participated in the study [38]. This scale comprises a total of 15 items and has been extensively validated [39]. It evaluates relationship satisfaction with multiple choice items concerning demonstrations of affection, philosophy of life, friends, sexual intercourse, etc. This questionnaire also includes a seven point Likert scale in which respondents indicate the number that best represents the degree of happiness currently existing within their relationship. The total score can range between 2 and 158, with an average of 100. Higher scores indicate better adjustment. For the purpose of this study, item wording was edited to apply to dating, cohabiting, as well as married couples.

Psychological Adjustment

Both members of each couple completed the Brief Symptom Inventory (BSI), a reliable and valid self-report measure of 53 items evaluating different psychological problems [40]. Norms are available for psychiatric as well as nonpatient men and women. Respondents indicate the extent to which they were bothered by each symptom listed during

the last 7 days, using a multiple choice set of answers ranging from “not at all” to “excessively.” This questionnaire includes nine subscales (somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, paranoid ideation, psychoticism, phobic anxiety, and hostility) and three global indices indicating global psychological distress.

Results

Psychosexual Profile of Women with Vestibulodynia and Their Partners

The data were normally distributed except for the women’s total score on the SHF. A logarithmic transformation was applied to this variable in order to obtain a normal distribution. The sample’s sociodemographic characteristics are detailed in Table 1. Both women and men were just under 30 years of age and the average educational level of women was roughly equivalent to a bachelor’s degree. The majority of women were French-speaking, had a Catholic affiliation, were cohabiting or married, and childless.

Women with vestibulodynia who were initially solicited but whose partner did not decide to par-

Table 1 Sociodemographic characteristics of the sample

	\bar{X}	SD
Age (years)		
Women	28.63	5.18
Men	29.88	6.04
Women’s duration of pain (years)	5.72	3.70
Women’s pain intensity/10*	7.19	1.78
Women’s education level (years)	15.84	2.39
	%	N
Women’s religious affiliation		
Catholic	69.80	30
Protestant	7.00	3
Jewish	4.70	2
Other	2.30	1
None	16.30	7
Marital status		
Regular partner	23.30	10
Cohabiting	48.80	21
Married	27.90	12
Women’s mother tongue		
French	76.70	33
English	23.30	10
Couple’s annual income		
\$0–19,999	34.90	15
\$20,000–39,000	18.60	8
\$40,000–59,000	23.30	10
>\$60,000	23.30	10
Childbirth (women)		
Uniparous or multiparous	18.60	8
Nulliparous	81.40	35

N = 43 unless otherwise specified.

*N = 42.

Table 2 Men and women’s mean psychological and dyadic adjustment, sexual functioning, and frequency of intercourse

	\bar{X}	SD
BSI (GSI)		
Women	52.60	8.59
Men	53.70	10.93
Locke-Wallace		
Women	115.67	11.64
Men	107.37	23.09
SHF		
Women	0.49*	0.11
Men	0.33	0.06
Women’s sexual intercourse frequency (per month)	4.52	3.46

* $P < 0.01$.

N = 43.

BSI = Brief Symptom Inventory; GSI = global severity index; SHF = Sexual History Form; Locke-Wallace = Locke-Wallace Marital Adjustment Scale.

ticipate were not different than the study participants on any of the sociodemographic variables. In addition, nonparticipants did not differ from participants in terms of their global sexual functioning, frequency of intercourse and pain. However, their dyadic adjustment—although still within norms—was significantly poorer ($t = 2.55$, $P < 0.01$), as was their psychological adjustment ($t = -4.24$, $P < 0.0001$).

The data pertaining to men and women’s psychosexual profiles are presented in Table 2. Psychological adjustment of participants, as measured by the BSI, did not differ from population norms. Men and women in this sample showed levels of psychological distress that are similar to what is found in the normal population (total T score for women = 52; total T score for men = 55) [40]. Both men and women’s dyadic adjustment average scores were above the norm of 100. As for sexual functioning, men and women had scores comparable to those obtained in a population without a sexual dysfunction (man $\bar{X} = 0.37$, $SD = 0.08$; woman $\bar{X} = 0.49$, $SD = 0.14$). However, the frequency of sexual intercourse reported by women was significantly below the standard norms for this age group. In contrast to women aged from 25 to 29 years in the general population who report engaging in sexual intercourse an average of 7.5 times per month, the women in our sample reported a frequency of 4.52 times per month [41]. Women and men did not differ from one another in terms of psychological and dyadic adjustment, although women reported significantly poorer sexual functioning than men ($t = 9.44$, $P < 0.01$).

Table 3 Intercorrelations of measures of pain, sexual function, dyadic adjustment, and partner reactions

	SHF-M	SHF-W	LW-M	LW-W	MCPS-W	Hostil-M	Freq-W
Pain	0.06	0.17	-0.13	-0.04	0.48*	0.45*	-0.29
SHF-M	—	-0.30	-0.02	0.05	-0.01	0.04	-0.00
SHF-W		—	0.13	-0.44*	0.04	-0.10	0.10
LW-M			—	0.16	0.00	-0.24	-0.08
LW-W				—	-0.03	0.06	-0.10
MCPS-W					—	0.12	0.12
Hostil-M						—	0.01

* $P < 0.01$.

$N = 43$.

Pain = pain intensity on scale of 0 to 10; SHF = Sexual History Form (M = men; W = women); LW = Locke-Wallace Marital Adjustment Scale (M = men; W = women); MCPS = Multidimensional Coital Pain Scale—Partner solicitousness subscale (W = women); Hostil = Hostility Scale from the Brief Symptom Inventory (BSI) (M = men); Freq = Sexual intercourse frequency (per month) (W = women).

Correlates of Pain During Intercourse

Intercorrelations of pain during intercourse, sexual functioning, frequency of intercourse, psychological distress, dyadic adjustment, and partner reactions are presented in Table 3. Sociodemographic variables did not correlate significantly with any of these measures. First, the women’s score on the SHF correlated negatively with their score on the Locke-Wallace Marital Adjustment Scale ($r = -0.44$, $P < 0.01$), indicating that better sexual functioning was associated with better dyadic adjustment. Second, pain during intercourse correlated positively with the partner solicitousness subscale of the MCPS ($r = 0.48$, $P < 0.01$), suggesting that women’s reports of positive/solicitous partner reactions were significantly related to higher pain intensity. Third, the hostility subscale of the BSI for the partners (BSI-M) correlated positively with women’s pain during intercourse ($r = 0.45$, $P < 0.01$), indicating that general expressions of hostility from the male partner (aggression, irritability, rage, and resentment) were associated with higher pain intensity [40]. No other correlations involving the BSI subscales were significant. Finally, sexual functioning was not correlated with pain during intercourse.

Partner Solicitousness and Hostility as Predictors of Pain During Intercourse

A traditional linear regression analysis was performed in order to examine the extent to which partner-related variables predicted pain intensity during intercourse. Based on results of the correlations, the partner hostility subscale of the BSI and the partner solicitousness subscale of the MCPS were selected as independent variables for this analysis. As shown in Table 4, each variable contributed significant unique variance to the prediction of pain during intercourse in women with vestibulodynia. Partner hostility accounted for

16% of the variance in pain intensity and perceived partner solicitousness accounted for 19% of the variance. The percentage of common variance explained by these two variables was 4%. The model combining both variables was significant and accounted for 36% of the variance ($F(2,40) = 12.73$; $P < 0.001$).

Discussion

The present study aimed, in part, to describe and compare the psychosexual profiles of women suffering from provoked vestibulodynia and their partners. Couples in this sample did not differ from a normal population in regard to psychological distress, dyadic adjustment, and global sexual functioning. However, the sexual activity frequency of these couples was significantly lower than what is usually observed in the general population for this age group. Results concerning dyadic adjustment and psychological distress of women suffering from vestibulodynia corroborate those found by several other authors [6,7]. However, studies that have compared women with vestibulodynia to a reference group generally report a significant deterioration in sexual functioning [6]. Our divergent results can be explained in part by our reliance on existing norms rather than a matched-control group and by the measure

Table 4 Summary of linear regression analysis examining the unique contribution of partner hostility and perceived partner solicitousness to the prediction of pain ($N = 43$)

	B	SE B	β
Partner hostility	0.07	0.02	0.40*
Perceived partner solicitousness	0.04	0.01	0.44*

* $P < 0.01$.

$R^2 = 0.39$, $F(2,40) = 12.73$, $P < 0.001$. Adj. $R^2 = 0.36$.

we used to assess sexual functioning, for which norms are not extensive. Also, our sample was mainly composed of highly educated, catholic women, who may not be comparable to women of the general population. In addition, these couples were recruited among a group of women participating in a treatment study and this may represent a sampling bias toward those who were coping more effectively with the problem. Indeed, when we compared participants with nonparticipants, we found that the latter had significantly poorer dyadic and psychological adjustment—although these were still within norms. Lastly, our findings concerning diminished intercourse frequency does corroborate those of other studies and confirm that sexual activity is negatively impacted by vestibulodynia [6].

With regard to partners, our findings mirror those of van Lankveld et al. who found that, compared with norms, partners of women suffering from vestibulodynia did not report more psychological, relational, and sexual distress [7]. Perhaps the relatively young age of the men in our sample partly explains their relative lack of psychosexual impairment.

The second purpose of this study was to explore whether variables related to the partner could have an impact on the experience of pain in women with vestibulodynia. Consistent with data from the pain literature, results suggest that the partners indeed have a role to play in the modulation of pain. Specifically, the men's general emotional state and intercourse-specific behavioral reactions appeared to exert an influence on the women's pain intensity. Women who reported what they perceived to be solicitous reactions from their partners or who had more generally hostile men as partners reported more intense pain. These results corroborate those found for other chronic pain conditions with regard to how relationship factors predict pain intensity and disability [22,24,26,27,42,43]. In these studies, partners' solicitous responses in addition to partners' negative responses contributed to the exacerbation of pain. However, contrary to what was found by Meana et al., dyadic adjustment did not correlate with pain intensity in our sample [32].

With respect to solicitous responses, it is possible that partner demonstrations of attention, support, and empathy for the woman's pain could constitute reinforcements that encourage the avoidance of sexual intercourse and promote higher pain appraisals, as suggested by Fordyce [18]. Further, in the specific case of vestibulodynia,

solicitous reactions from the male partner could contribute to reinforce women's catastrophic thinking concerning their pain condition. Catastrophizing is considered to be the most robust psychosocial predictor of pain intensity in chronic pain conditions [44]. Finally, from a systems perspective, such reactions could be interpreted as a form of collusion whereby the partner becomes an enabler who "needs" the dyspareunia to serve some other psychological need of his and maintain a maladaptive stability in the relationship.

As for negative partner reactions, hostility could compromise the psychological adjustment of women with vestibulodynia in subtle ways, as has been reported in the chronic pain literature [42,45]. More specifically, negative and hostile responses from the partner appear strongly related to increases in patients' depressive symptoms [12,30,46]. Moreover, depressive symptomatology is a predictor of pain intensity and disability among individuals with chronic pain and among women suffering from vestibulodynia [47–52]. Although the relatively young women in our study did not report depressive symptoms, the cumulative impact of vestibulodynia over the years in the context of a relationship marred by hostility could result in mood disturbances as well as pain intensification. Partner hostility could also impact on pain intensity by creating an unfavorable context for sexual intercourse that is not conducive to either effective pain management strategies or a less penetration-focused, more flexible sexual repertoire. The ultimate result could be a fueling of the anxiety and hypervigilance observed in women with vestibulodynia, as well as pelvic floor hypertonicity—factors associated with the maintenance and exacerbation of genital pain [53–57].

The present study entails a number of limitations. First, the correlational nature of the design does not make it possible to infer causality regarding the impact of the partners' reactions on pain intensity. Nevertheless, it can serve as a platform from which to elaborate future prospective studies that would assess whether partner reactions at baseline might predict pain intensity several months or years later. Second, some of the questionnaires used in the study limit the conclusions that can be drawn from the results. Indeed, the hostility scale of the BSI is not designed to measure hostile attitudes specific to chronic pain. However, there is no available validated questionnaire that is specifically designed for the partners of women with dyspareunia. The development of

this type of questionnaire is warranted in order to stimulate the expansion of knowledge in this field. Further, the MCPS is still in the process of being validated, thus limiting confidence in results emanating from it. Third, considering that the sample size is relatively small and homogeneous in terms of the presence of vulvar pain, findings may not be generalizable to the entire population of women with dyspareunia. In addition, the response rate of the partners was fairly low, and our comparative analyses between women participants and nonparticipants suggest that nonparticipants were more distressed, which may have introduced a bias in our sample in favor of more well adjusted couples. Nonetheless, our sample was comparable to van Lankveld et al.'s with regard to sociodemographic characteristics and pain duration [7]. Moreover, women in this sample are similar to women who participated in epidemiological studies of vulvovaginal pain [4,58].

Despite these limitations, this study provides the first empirical demonstration that partner reactions to pain during intercourse may contribute to an increase in pain intensity and thus constitutes preliminary support of the role of dyadic variables in the experience of vulvo-vaginal pain. More research is necessary to determine patient characteristics and conditions that may mediate the impact of partner solicitous responses or hostility demonstrations on pain intensity. Pain duration, pain adaptation style, and the kind of responses given by the partners when facing women's pain behaviors have been identified as playing a role in other pain problems [19,20,59]. Furthermore, prospective studies including a broader range of variables should be carried out in order to establish causal relationships and to reflect the complexity of couple interactions and their influence on the experience of genital pain.

Conclusions

In summary, results suggest that although the psychosexual and relationship characteristics of partners of women with vestibulodynia are within norms, their responses may play a role in the experience of pain. Specifically, partner solicitousness and hostility were predictive of higher pain intensity during intercourse. Clinically, these results stress the importance of considering partner-related variables in the treatment of vestibulodynia and of including the partner in sex therapy treatments for dyspareunia.

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References

- 1 Moyal-Barracco M, Lynch P. 2003 ISSVD terminology and classification of vulvodynia: A historical perspective. *J Reprod Med* 2004;49:772-7.
- 2 Friedrich EG. Therapeutic studies on vulvar vestibulitis. *J Reprod Med* 1988;33:514-7.
- 3 Meana M, Binik YM, Khalifé S, Cohen D. Dyspareunia: Sexual dysfunction or pain syndrome? *J Nerv Ment Dis* 1997;185:561-9.
- 4 Harlow BL, Wise LA, Stewart EG. Prevalence and predictors of chronic lower genital tract discomfort. *Am J Obstet Gynecol* 2001;185:545-50.
- 5 Bergeron S, Binik YM, Khalifé S, Pagidas K, Glazer HI. Vulvar vestibulitis syndrome: Reliability of diagnosis and evaluation of current diagnostic criteria. *Obstet Gynecol* 2001;98:45-51.
- 6 Meana M, Binik YM, Khalifé S, Cohen D. Biopsychosocial profile of women with dyspareunia. *Obstet Gynecol* 1997;90:583-9.
- 7 van Lankveld JJDM, Weijnenborg PTHM, ter Kuile MM. Psychologic profiles of and sexual function in women with vulvar vestibulitis and their partners. *Obstet Gynecol* 1996;88:65-70.

- 8 Weijmar Schultz W, Basson R, Binik Y, Eschenbach D, Wessellmann U, van Lankveld J. Women's sexual pain and its management. *J Sex Med* 2005;2:301-16.
- 9 Danielsson I, Slöberg I, Wikman M. Vulvar vestibulitis: Medical, psychosexual and psychosocial aspects, a case-control study. *Acta Obstet Gynecol Scand* 2000;79:872-8.
- 10 Reed BD, Haefner HK, Punch MR, Roth RS, Gorenflo DW, Gillespie BW. Psychosocial and sexual functioning in women with vulvodynia and chronic pelvic pain. A comparative evaluation. *J Reprod Med* 2000;45:624-32.
- 11 Flor H, Kerns RD, Turk DC. The role of spouse reinforcement, perceived pain, and activity levels of chronic pain patients. *J Psychosom Res* 1987;31:251-9.
- 12 Kerns RD, Haythornthwaite J, Southwick S, Giller EL. The role of marital interaction in chronic pain and depressive symptom severity. *J Psychosom Res* 1990;34:401-8.
- 13 Romano JM, Turner JA, Jensen MP, Friedman LS, Bulcroft RA, Hops H, Wright SF. Chronic pain patient-spouse behavioral interactions predict patient disability. *Pain* 1995;63:353-60.
- 14 Pence L, Cano A, Thorn B, Ward LC. Perceived spouse responses to pain: The level of agreement in couple dyads and the role of catastrophizing, marital satisfaction, and depression. *J Behav Med* 2006;29:511-22.
- 15 Flor H, Turk DC, Rudy TE. Relationship of pain impact and significant other reinforcement of pain behaviors: The mediating role of gender, marital status and marital satisfaction. *Pain* 1989;38:45-50.
- 16 Lousberg R, Schmidt AJM, Groenman NH. The relationship between spouse solicitousness and pain behavior: Searching for more experimental evidence. *Pain* 1992;51:75-9.
- 17 Boothby JL, Thorn BE, Overduin LY, Ward LC. Catastrophizing and perceived partner responses to pain. *Pain* 2004;109:500-6.
- 18 Fordyce WE. Behavioral methods for chronic pain and illness. St-Louis, MO: CV Mosby; 1976.
- 19 Block AR, Kremer EF, Gaylor M. Behavioral treatment of chronic pain: The spouse as a discriminative cue for pain behavior. *Pain* 1980;9:243-52.
- 20 Block AR, Boyer SL. The spouse's adjustment to chronic pain: Cognitive and emotional factors. *Soc Sci Med* 1984;19:1313-7.
- 21 Cano A, Johansen AB, Leonard MT, Hanawalt JD. What are the marital problems of patients with chronic pain? *Curr Pain Headache Rep* 2005;9:96-100.
- 22 Flor H, Turk DC, Scholz B. Impact of chronic pain on the spouse: Marital, emotional, and physical consequences. *J Psychosom Res* 1987;31:63-71.
- 23 Flor H, Elbert T, Knecht S, Wienbruch C, Pantev C, Birbaumer N, Larbig W, Taub E. Phantom-limb pain as a perceptual correlate of cortical reorganization following arm amputation. *Nature* 1995;375:482-4.
- 24 Flor H, Turk DC. Chronic back pain and rheumatoid arthritis: Predicting pain and disability from cognitive variables. *J Behav Med* 1988;11:251-65.
- 25 Romano JM, Turner JA, Friedman LS, Bulcroft RA, Jensen MP, Hops H, Wright SF. Sequential analysis of chronic pain behaviors and spouse responses. *J Consult Clin Psychol* 1992;60:777-82.
- 26 Romano JM, Jensen MP, Turner JA, Good AB, Hops H. Chronic pain patient-partner interactions: Further support for a behavioral model of chronic pain. *Behav Ther* 2001;31:415-550.
- 27 Williamson D, Robinson ME, Melamed B. Pain behavior, spouse responsiveness, and marital satisfaction in patients with rheumatoid arthritis. *Behav Modif* 1997;21:97-118.
- 28 Anderson LP, Cole TM, Gullickson G, Hudgens A, Roberts H. Behavior modification of chronic pain: A treatment program by a multidisciplinary team. *Clin Orthop Relat Res* 1977;129:96-100.
- 29 Waltz M, Kriegel W, van't Pad Bosh P. The social environment and health in rheumatoid arthritis: Marital quality predicts individual variability in pain severity. *Arthritis Care Res* 1998;11:356-74.
- 30 Schwartz L, Slater MA, Birchler GR. The role of pain behaviors in the modulation of marital conflict in chronic pain couples. *Pain* 1996;65:227-33.
- 31 Cano A, Gillis M, Heinz W, Geisser M, Foran H. Marital functioning, chronic pain, and psychological distress. *Pain* 2004;107:99-106.
- 32 Meana M, Binik I, Khalifé S, Cohen D. Affect and marital adjustment in women's rating of dyspareunnic pain. *Can J Psychiatry* 1998;43:381-5.
- 33 Bergeron S, Binik YM, Khalifé S, Pagidas K, Glazer HI, Meana M, Amsel R. A randomized comparison of group cognitive-behavioral therapy, surface electromyographic biofeedback, and vestibulectomy in the treatment of dyspareunia resulting from vulvar vestibulitis. *Pain* 2001;91:297-306.
- 34 Kerns RD, Turk DC, Rudy TE. The West Haven-Yale Multidimensional Pain Inventory (WHYMPI). *Pain* 1985;23:345-56.
- 35 Jensen MP, Karoly P. Self-report scales and procedures for assessing pain in adults. In: Turk DC, Melzack R, eds. *Handbook of pain assessment*. New York: Guilford Press; 2001:15-34.
- 36 Nowinski JK, LoPiccolo J. Assessing sexual behaviors in couples. *J Sex Marital Ther* 1979;5:225-43.
- 37 Creti L, Fichten CS, Amsel R, Brender W, Schover LR, Kalogeropoulos D, Libman E. Global sexual functioning: A single Summary score for Nowinski and LoPiccolo's Sexual History Form (SHF). In: Davis CM, Yarber WL, Bauserman R, Schreer G, Davis SL, eds. *Handbook of sexuality-related measures*. Thousand Oaks, CA: Sage Publications; 1998:261-7.

- 38 Locke HJ, Wallace KM. Short marital-adjustment and prediction tests: Their reliability and validity. *J Marriage Fam Living* 1959;21:251–5.
- 39 Crane DR, Allgood SM, Larson JH, Griffin W. Assessing marital quality with distressed and nondistressed couples: A comparison and equivalency table for three frequently used measures. *J Marriage Fam* 1990;52:87–93.
- 40 Derogatis LR The Brief Symptom Inventory (BSI): Administration, scoring and procedures manual—II. 2nd edition. Baltimore, MD: Clinical Psychometric Research Inc.; 1982.
- 41 Laumann EO, Gagnon JH, Michael RT, Michaels S. The social organization of sexuality: Sexual practices in the United States. Chicago, IL: The University of Chicago Press; 1994.
- 42 Fernandez E, Turk DC. The scope and significance of anger in the experience of chronic pain. *Pain* 1995;61:165–75.
- 43 Graham JE, Robles TF, Kiecolt-Glaser JK, Malarkey WB, Bissell MG, Glaser R. Hostility and pain are related to inflammation in older adults. *Brain Behav Immun* 2006;20:389–400.
- 44 Sullivan MJL, Thorn B, Haythornthwaite JA, Keefe F, Martin M, Bradley LA, Lefebvre JC. Theoretical perspectives on the relation between catastrophizing and pain. *Clin J Pain* 2001;17:52–64.
- 45 Burns JW, Johnson BJ, Mahoney N, Devine J, Pawl R. Anger management style, hostility and spouse responses: Gender differences in predictors of adjustment among chronic pain patients. *Pain* 1996;64:445–53.
- 46 Cano A, Weisberg JN, Gallagher RM. Marital satisfaction and pain severity mediate the association between negative spouse responses to pain and depressive symptoms in a chronic pain patient sample. *Pain Med* 2000;1:35–43.
- 47 Romano JM, Turner JA. Chronic pain and depression: Does the evidence support a relationship? *Psychol Bull* 1985;97:18–34.
- 48 Haythornthwaite JA, Sieber WJ, Kerns RD. Depression and the chronic pain experience. *Pain* 1991;46:177–84.
- 49 Walsh TM, Smith CP, McGrath PJ. Pain correlates of depressed mood in young adults. *Pain Res Manag* 1998;3:135–44.
- 50 Sullivan MJL, Rodgers WM, Kirsch I. Catastrophizing, depression and expectancies for pain and emotional distress. *Pain* 2001;91:147–54.
- 51 Jantos M, White G. The vestibulitis syndrome: Medical and psychosexual assessment of a cohort of patients. *J Reprod Med* 1997;42:145–52.
- 52 Dunn KM, Croft PR, Hackett GI. Association of sexual problems with social, psychological, and physical problems in men and women: A cross sectional population survey. *J Epidemiol Community Health* 1999;53:144–8.
- 53 Nunns D, Mandal D. Psychological and psychosexual aspects of vulvar vestibulitis. *Genitourin Med* 1997;73:541–4.
- 54 Gates EA, Galask RP. Psychological and sexual functioning in women with vulvar vestibulitis. *J Psychosom Obstet Gynaecol* 2001;22:221–8.
- 55 Granot M, Friedman M, Yarnitsky D, Zimmer EZ. Enhancement of the perception of systemic pain in women with vulvar vestibulitis. *Br J Obstet Gynaecol* 2002;109:863–6.
- 56 Payne KA, Binik YM, Amsel R, Khalifé S. When sex hurts, anxiety and fear orient attention towards pain. *Eur J Pain* 2005;9:427–36.
- 57 Reissing ED, Brown C, Lord MJ, Binik YM, Khalifé S. Pelvic floor muscle functioning in women with vulvar vestibulitis syndrome. *J Psychosom Obstet Gynaecol* 2005;26:107–13.
- 58 Gordon AS, Panahian-Jand M, McComb F, Melegari C, Sharp S. Characteristics of women with vulvar pain disorders: Responses to a web-based survey. *J Sex Marital Ther* 2003;29:45–58.
- 59 Peters ML, Sorbi MJ, Kruse DA, Kerssens JJ, Verhaak PFM, Bensing JM. Electronic diary assessment of pain, disability and psychological adaptation in patients differing in duration of pain. *Pain* 2000;84:181–92.