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ORIGINAL ARTICLE

The prevalence of sexual dysfunction and associated risk factors in women with chronic pelvic pain: a cross-sectional study

Fatma Ferda Verit · Ayhan Verit · Ercan Yeni

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Abstract The aims of the study were to determine the prevalence of sexual dysfunction, its subtypes and associated risk factors in women with chronic pelvic pain (CPP) as compared to a general female population. We evaluated 112 women (mean age 34.73 ± 8.07; age range 18–50) complaining of CPP with a comprehensive history including female sexual function index (FSFI) and several general assessment questions (GAQs), a complete physical examination and routine laboratory tests. A group of 108 healthy women (mean age 33.28 ± 7.95; age range 19–52) without CPP were enrolled as cross-sectional controls. According to the general population, the incidence of female sexual dysfunction (FSD) was 67.8% in women with CPP and 32.2% in women without CPP ($P < 0.0001$). Among 112 CPP patients, 78 (69.6%) of them had FSD and 34 (30.4%) patients did not have FSD in the study ($P < 0.0001$). In that 78 patients, 42 patients (53.8%) had hypoactive sexual desire disorder, 26 patients (33.3%) had sexual arousal disorder, 17 patients (21.7%) had orgasmic disorder and finally 58 patients (74.3%) had sexual pain disorder. The FSFI scores in both groups were as follows: (patients vs. controls; median value; *P* value, respectively): desire: 3.31 versus 3.98 ($P < 0.0001$); arousal: 3.58 versus 4.35 ($P < 0.0001$); lubrication: 4.20 versus 4.88 ($P < 0.0001$); orgasm: 3.70 versus 4.48 ($P < 0.0001$); sexual satisfaction: 3.80 versus 4.64 ($P < 0.0001$); sexual pain: 2.75 versus 4.98 ($P < 0.0001$) and total FSFI score: 21.35 versus 27.29 ($P < 0.0001$). The prevalence of FSD was higher in women with CPP than in a general healthy population not complaining of CPP. Investigation of female sexuality was essential for these patients.

Keywords Chronic pelvic pain · Female sexual dysfunction · Prevalence · Risk factors

F. F. Verit (✉) · A. Verit · E. Yeni
Department of Obstetrics & Gynecology, Harran University Medical School, Arastirma ve Uygulama Hastanesi, Sanliurfa 63100, Turkey
e-mail: averit@harran.edu.tr

Introduction

Chronic pelvic pain (CPP) is a common problem with a prevalence of about 38/1,000 among women aged 20–50 years [5]. It has been shown significantly to affect women's daily activities, quality of life and has a significant negative impact on mental and physical health and sexual functions [5, 14].

Few studies have reported the frequency of changes in sexual function in CPP patients [2, 13]. Maruta et al. interviewed 50 CPP sufferers and their spouses of whom 78% of the pain sufferers and 84% of partners described deterioration, including cessation of their sex life [13]. In another survey of patients with back pain referred to rehabilitation, half of the sample reported decreased frequency of sex since the onset of chronic pain, associated with physical limitations, fatigue and loss of sexual satisfaction [2]. However, the prevalence of sexual function, its subtypes and associated risk factors in women with CPP have not been fully evaluated and this area has remained to be investigated.

The female sexual function index (FSFI) is a 19-item questionnaire, has been developed as a brief, multidimensional self-report instrument for assessing the key dimensions of sexual function in women which includes desire, subjective arousal, lubrication, orgasm, satis-

faction and pain [19]. Among existing measures of sexual function, it appears to be best with regard to its psychometrics that also has been validated for assessment of quality of life in clinical trials and epidemiologic studies [19].

The aim of this study was to determine the prevalence of sexual dysfunction and its subtypes in CPP patients in comparison with a control group of age-matched subjects without CPP. We also investigated sexual function domains by FSFI and associated risk factors in this study.

Materials and methods

Participants in the study were 112 premenopausal women with a history of CPP who admitted to our outpatient clinic. Inclusion criteria were pain longer than 6 month's duration, not exclusively associated with menstrual periods or sexual intercourse, age between 18–52 years, and married. Exclusion criteria were those having pregnancy, having surgery, labor or delivery in less than 3 month's period, history of traumatic deliveries, chronic inflammatory bowel disease, mental diseases, and pain due to malignancy, treated elsewhere for pain condition, or taking any medication that had potential both to impair and enhance sexual function like analgesic or psychotropic drugs. None of them had any history of physical or sexual abuse. None of the women reported any history of psychiatric disease, any major depressive disorder or marital problems. A group of 108 healthy subjects assessed in a yearly gynecological evaluation for cancer prevention and not complaining of CPP were used as cross-sectional controls. Each subject gave her informed consent before interview. All patients were evaluated by a detailed medical, sexual history, physical and gynecological exam, including laboratory tests such as smear tests, urine analysis and ultrasonography, and psychological history by unstructured interview.

Measures

Several general assessment questions (GAQs) specifically designed to guide the investigation of women's sexual function [20]. The entire questionnaire was presented in Appendix. At this time the Turkish version of GAQs was not linguistically validated. For providing Turkish version of GAQs, a translation was produced and translated back to English to ensure that the original meaning of each item was maintained. Criteria of sexual dysfunction were made by classifying their complaints according to the international classification of female sexual dysfunction (FSD) proposed by the International Consensus Development Conference [3]. Following the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and World Health Organization International Classifications of Diseases (ICD-10), FSD was divided into four disorders that cause personal distress, briefly defined as: desire, arousal, orgasmic and sexual pain disorders [3]. Moreover, FSFI were used to standardize the interview regarding the patient's sexual life [19]. The FSFI been validated in the Turkish language and in Turkish population before [17]. This instrument has 6 domains that measure desire, arousal, lubrication, orgasm, satisfaction and pain. Each domain is scored on a scale of 0–6 with higher scores indicating better function for each domain. A domain score of zero indicated that the women reported no sexual activity during the previous month and the full score ranged from 2 to 36 [19].

CPP was assessed for typical severity according to the validated 10-cm visual analog scale from ''least possible pain'' to ''worst possible pain'' [25]. Cumulative duration of pelvic pain (in hours) during the previous 12 months was calculated for each case patient with CPP by multiplying the reported average duration of a CPP episode by the number of episodes [25].

Statistical analysis

We used χ^2 analysis (for categorical data) and student's t test (for continuous variables) to identify statistically significant associations. Finally, we used multiple logistic regression analysis to determine whether sociodemographic characteristics, duration of pain, visual analog scale and cumulative duration of pelvic pain were associated with sexual complaints in CPP group.

Results

The demographic characteristics of the patients were detailed in Table 1.The mean age of the study group was 34.73 ± 8.07 years (range 18–50 years) and 33.28 ± 7.95 years (range 19–52 years) for the control group ($P > 0.05$). The average marriage period for study group was 14.58 ± 8.65 years and 13.26 ± 8.17 years for the control group ($P > 0.05$). The groups did not differ in terms of age, the number of parity and abortions, the marriage period, the education and family income status ($P > 0.05$, for all of them).

Among all women with CPP, 33 patients (29.5%) reported that the pain had first started 6 months–1 year previously, 49 patients (43.8%) had the pain for

Table 1 Demographic characteristics of study and control groups

	The patients with chronic pelvic pain (n = 112)	The patients without chronic pelvic pain (n = 108)	P value
Age (years)			NS
< 30	38 (33.9%)	41 (38.0%)	
30–39	37 (33.0%)	39 (36.1%)	
40–49	36 (32.1%)	23 (21.3%)	
> 50	1 (0.9%)	5 (4.6%)	
Parity			NS
0	9 (8.0%)	9 (8.3%)	
1–2	32 (28.6%)	43 (39.8%)	
≥ 3	71 (63.4%)	56 (51.9%)	
Abortion			NS
0	66 (58.9%)	72 (66.7%)	
1–2	31 (27.7%)	27 (25.0%)	
≥ 3	15 (13.4%)	9 (8.3%)	
Marriage period (years)			NS
< 10	30 (26.8%)	38 (35.2%)	
10–20	52 (46.4%)	50 (46.3%)	
> 20	30 (26.8%)	20 (18.5%)	
Education			NS
Uneducated	46 (41.1%)	36 (33.3%)	
Primary school	40 (35.7%)	50 (46.3%)	
High school and over	26 (23.2%)	22 (20.4%)	
Family income (per month)			NS
Low (< $250)	37 (33.0%)	28 (25.9%)	
Middle ($250–500)	59 (52.7%)	60 (55.6%)	
High (> $500)	16 (14.3%)	20 (18.5%)	

NS Non-significant

> 1–5 years and 26 (23.2%) patients stated that it had started > 5 years previously. Four patients (3.6%) were unable to recall the year of pain onset. The mean level of visual analog score for CPP patients was 5.72 ± 2.18. The mean cumulative pain duration in last 12 months was 381.31 h (range; 4–1,460 h).

We evaluated FSD and its subgroups in accordance with the FSD classification (sexual desire disorder, sexual arousal disorder, orgasmic disorder and sexual pain disorder) [3]. According to the general population, the incidence of FSD was 67.8% in women with CPP and 32.2% in women without CPP ($P < 0.0001$). Among 112 CPP patients, 78 (69.6%) of them had FSD and 34 (30.4%) patients did not have FSD in the study ($P < 0.0001$). In that 78 patients, 42 patients (53.8%) had hypoactive sexual desire disorder, 26 patients (33.3%) had sexual arousal disorder, 17 patients (21.7%) had orgasmic disorder and finally 58 patients (74.3%) had sexual pain disorder.

Table 2 shows the means and standard deviations for the full scale and for the six subscales of the FSFI for CPP sample and for the sample of healthy women. The CPP patients reported significantly lower desire, arousal, lubrication, orgasm, satisfaction and pain scores than controls ($P < 0.0001$, for all of them). The mean values of total FSFI score were 21.35 ± 7.74 in the study and 27.29 ± 6.54 in the control group and there was also a significant difference between the two groups ($P < 0.0001$).

We investigated whether there were any correlations between demographic or pain characteristics and FSD in CPP group by multiple regression analysis in Table 3. Age, education, family income, duration of pain, visual analog score and cumulative pain duration in last 12 months were significantly associated with FSD in women with CPP ($P < 0.05$, $P < 0.05$, $P < 0.001$,$P < 0.05$, $P < 0.001$, $P < 0.0001$, respectively). However, there were no correlations between the parity and abortion numbers, marriage period and FSD in CPP group ($P > 0.05$, for all of them).

Discussion

This was the first report that evaluated the prevalence of FSD and its subtypes in CPP population compared with cross-sectional controls. The present study showed that FSD was highly prevalent in women with CPP. The analysis of the general assessment questions demonstrated that all categories of sexual dysfunction were represented in the group of patients with CPP in accordance with FSD classification. The comparison of FSFI scores showed that all of the sexual function domains (desire, arousal, lubrication, orgasm, satisfaction and pain) were significantly different from women without CPP. Furthermore, it has also been evaluated that age, education, family income, duration of pain, visual analog score and cumulative pain duration in last 12 months were significantly associated with FSD in CPP group.

The prevalence of FSD in women with CPP was higher (67.8 vs. 32.2%) than in women without CPP in this study. Results from a national survey of people aged between 18–59 years indicated that sexual dysfunction was common among women in 43% of cases [12]. Another study reported that prevalence of FSD was 46.9% in Turkish women aged between 18 and 66 years [4]. Among CPP patients, 69.6% of them had FSD in the study. Several studies have been published which demonstrated high prevalence of sexual difficulties in CPP patients [13, 16]. In one study, approximately two-thirds of patients reported reduced frequency in their sexual relations as a result of CPP [16]. Another study of patients enrolled in chronic pain

Table 2 The mean value of female sexual function index (FSFI) scores for both patients and healthy controls

FSFI scales	The patients with chronic pelvic pain (n = 112)	The patients without chronic pelvic pain (n = 108)	P value
Desire	3.31 ± 1.38	3.98 ± 1.33	< 0.0001
Arousal	3.58 ± 1.29	4.35 ± 1.18	< 0.0001
Lubrication	4.20 ± 1.52	4.88 ± 1.27	< 0.0001
Orgasm	3.70 ± 1.62	4.48 ± 1.32	< 0.0001
Satisfaction	3.80 ± 1.46	4.64 ± 1.22	< 0.0001
Pain	2.75 ± 1.39	4.98 ± 1.24	< 0.0001
Full scale	21.35 ± 7.74	27.29 ± 6.54	< 0.0001

treatment programs in England found that 73% had pain-related sexual problems [13]. Sexual pain disorder was the most prevalent sexual difficulty followed by hypoactive desire disorder in CPP patients with FSD in our study (74.3, 53.8% respectively). These patients expressed that sexual fantasies were frequently associated with the fear of having a pain episode during intimacy, thus resulting in sexual anxiety. We can conclude that motivational-affective unconscious and cognitive aspects of libido could influence women's sexual desire. Women with CPP reported worse sexual function with regard to desire, arousal, lubrication, orgasm, satisfaction and more frequent and severe pain with vaginal penetration. Although all the sexual function domains have not been adequately studied before, it has been shown that a large majority of

Table 3 The impact of demographic and pain characteristics on female sexual function in chronic pelvic pain (CPP) patients

	Women with sexual dysfunction (n = 78)	Women without sexual dysfunction (n = 34)	P value
Age (years)			< 0.05
< 30	21 (26.9%)	17 (50.0%)	
30–39	25 (32.1%)	12 (35.3%)	
40–49	31 (39.7%)	5 (14.7%)	
> 50	1 (1.3%)	0 (0.0%)	
Parity			NS
0	5 (6.4%)	4 (11.8%)	
1–2	22 (28.2%)	10 (29.4%)	
≥ 3	51 (65.4%)	20 (58.8%)	
Abortion			NS
0	43 (55.1%)	23 (67.6%)	
1–2	23 (29.5%)	8 (23.5%)	
≥ 3	12 (15.4%)	3 (8.8%)	
Marriage period (years)			NS
< 10	19 (24.4%)	11 (32.4%)	
10–20	34 (43.6%)	18 (52.9%)	
> 20	25 (32.1%)	5 (14.7%)	
Education			< 0.05
Uneducated	38 (48.7%)	8 (77.1%)	
Primary school	22 (28.2%)	18 (50.0%)	
High school and over	18 (23.1%)	8 (71.4%)	
Family income (per month)			< 0.001
Low (< $250)	30 (38.5%)	3 (8.8%)	
Middle ($250–500)	36 (46.2%)	26 (76.5%)	
High (> $500)	12 (15.4%)	5 (14.7%)	
First onset of pain			< 0.05
6 month–1 year earlier	16 (20.5%)	17 (50.0%)	
> 1–5 year earlier	38 (48.7%)	11 (32.4%)	
> 5 year earlier	20 (25.6%)	6 (17.6%)	
Unknown	4 (5.1%)	0 (0%)	
Visual analog score (mean ± SD)	6.62 ± 2.03	4.64 ± 1.63	< 0.001
Cumulative pain duration in last 12 months (hour, mean ± SD)	571.73 ± 485.01	71.85 ± 105.40	< 0.0001

NS Non-significant

women with CPP had a combination of difficulties with arousal, performance, had problems with finding a comfortable position, fear of worsening pain, relationship problems and loss of self-confidence [2].

FSFI is currently the most frequently used FSD questionnaire, and the measure presents acceptable test–retest reliability, internal consistency and validity [19]. It is a relatively new, multidimensional self-report measure of sexual function and is considered one of the most important dimensions of sexual function. This measure has also been shown to discriminate women with and without sexual dysfunction by many studies [9, 15, 19, 24].

Concerning the role of sociodemographic characteristics, age, education and family income were negatively correlated with FSD in CPP patients. It has been known that there is a close relationship between FSD and age in general population [8, 10, 23]. Sexual activity and function decline with age for most women [8]. Lower educational levels are positively associated with the presence of sexual dysfunctions, as also shown by similar findings by several groups [1, 4, 12]. Educated women were half as likely to report low sexual desire, problems achieving orgasm, sexual pain and sexual anxiety as women who did not have any education [4, 21]. It has also been reported that women with higher family income had more sexual satisfaction by the studies [4, 23].

Although some studies demonstrated that sexual problems were more common in the presence of multiparity [4, 6], we found that the parity and abortion numbers were not associated with any sexual complaint in CPP population. Marriage period had no significant effect on FSD that also supported another study in the literature [18].

We observed that pain intensity measured by visual analog scale had negative effects on FSD in the study. Although the vast majority of studies have investigated the close relationship between sexual activity and pain intensity [11, 22], they have reported somewhat conflicting results. Monga et al. [16] and Hægerstam and Allerbring [7] found no relationship between sexual functioning and pain ratings in patients with chronic pain. In another study, Kwan et al. [11] reported that the patients with high levels of sexual dysfunction had generally lived with their pain problem for shorter periods of time. In our study, we showed that the longer periods of pain duration and higher cumulative pain duration in last 12 months were significantly associated with higher levels of sexual dysfunction. Among all the associated risk factors, we found that cumulative pain duration in last 12 months had the strongest correlation with FSD in CPP population ($P < 0.0001$).

Finally, we found that FSD was highly prevalent in women with CPP. The organic and/or psychosocial components of CPP may affect all categories of sexual dysfunction. There were close relationships between sociodemographic factors (age, education, family income) and pain characteristics (duration of pain, visual analog score and cumulative pain duration in last 12 months) and FSD in CPP patients. However, most of these patients have never been investigated with regard to their sexual life and sexual activity. This fact reflects ''common'' opinion concerning the lack of importance attributed to women's sexuality, and it also explains the delay in studies regarding women's sexual function and dysfunction. We suggest that sexual function and associated risk factors in women with CPP should be investigated for effective treatment and prevention strategies.

Appendix—list of GAQs

GAQ1 Over the past 4 weeks, have you felt a reduced sexual interest or sexual desire (i.e., fewer sexual fantasies, thoughts and dreams)? Yes/No

GAQ2 Over the past 4 weeks, have you often initiated sexual activity with your partner? Yes/No

GAQ3 Over the past 4 weeks, how would you rate your level of sexual arousal during sexual activity or intercourse? High/Low

GAQ4 Over the past 4 weeks, in general, have you enjoyed penetration and intercourse? Yes/No

GAQ5 Over the past 4 weeks, have you achieved an orgasm when engaging in sexual activity?

(e.g., intercourse or non-coital sexual activity)? Yes/No

GAQ6 Over the past 4 weeks, have you experienced discomfort or pain during or after vaginal penetration? Yes/No

GAQ7 Over the past 4 weeks, have you experienced pain in your vagina/genital area during or after sexual activity without penetration (e.g., masturbation, oral sex)? Yes/No

GAQ8 Over the past 4 weeks, were you generally satisfied with your sexual life? Yes/No

GAQ9 Over the past 4 weeks, did you have a satisfactory sexual relationship with your partner? Yes/No

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