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Assessment of Vulvodynia Symptoms in a Sample of U.S. Women: A Prevalence Survey with a Nested Case Control Study

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Abstract

Objective—Vulvodynia is a chronic pain syndrome of unknown etiology with scant data on frequency. This study assessed the prevalence of vulvodynia symptoms in a sample of U.S. women and compared health characteristics of symptomatic and asymptomatic women.

Study Design—A phone survey contacted 2,127 U.S. households to identify 100 symptomatic women, who were matched on age and time-zone to 325 asymptomatic controls. Odds ratios and logistic regression were used to model associations between pain, medical conditions, and healthcare utilization variables.

Results—Current vulvar pain of at least 6 months duration was reported by 3.8% of respondents, with a 9.9% lifetime prevalence. Forty-five percent of women with pain reported an adverse effect on their sexual life and 27% an adverse effect on their life style. Cases more frequently reported repeated urinary tract infections (OR, 6.15; 95% CI, 3.51–10.77) and yeast infections (OR, 4.24; 95% CI, 2.47–7.28). Associations existed with chronic fatigue syndrome (OR, 2.78; 95% CI, 1.33–6.19), fibromyalgia (OR, 2.15; 95% CI, 1.06–4.36), depression (OR, 2.99; 95% CI, 1.87–4.80), and irritable bowel syndrome (OR, 1.86; 95% CI, 1.07–3.23).

Conclusions—Lifetime chronic vulvar pain was less prevalent in this national sample of women than previous data suggest and was correlated with several co-morbid chronic medical conditions and substantial reduction in self-reported quality of life.

Keywords

Vulvodynia; chronic pain; vulvar pain; prevalence

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Condensation Approximately 10% of English-speaking U.S. women experience chronic vulvar pain in their lifetime, a number previously unreported on a national scale.

Introduction

Vulvodynia is a chronic lower genital tract pain syndrome of unknown origin characterized by vulvar rawness, burning, and/or stinging.¹ Diagnosis is based on excluding other etiologies of pain, and associated pelvic pathology is limited to vulvar erythema. The lifetime prevalence of this condition has been reported as high as 28% in the adult population, although population-based studies are limited.^{2–6} Current literature supports associations between vulvodynia and fibromyalgia, chronic fatigue syndrome,⁷ pain with first tampon use,⁴ yeast infections,^{4, 7} recurrent vulvovaginal infections,^{4, 7–10} irritable bowel syndrome,⁷ interstitial cystitis,¹¹ and oral contraceptive use.¹² The burden imposed on the healthcare system by vulvodynia has yet to be well characterized. A Gallup survey indicated that \$882 million are annually spent on chronic pelvic pain, with up to 15% of women missing work and 45% experiencing diminished work productivity due to gynecologic pain.¹³

This national telephone survey ascertained the prevalence and impact of self-reported chronic vulvar pain consistent with symptoms of vulvodynia¹⁴ in a sample of English speaking U.S. women. A case control study was nested within this survey to compare health histories of symptomatic women to those without symptoms.

Materials and Methods

Over a four month period, a sample of U.S. households was screened by telephone to identify 100 English speaking women with symptoms of vulvodynia. Subjects were matched to 325 asymptomatic women for inclusion in the case control portion of the study. Sample size was determined by using estimates of a 15–18% prevalence of vulvodynia.^{3, 5} Participants answered a 30-minute questionnaire that assessed demographics, medical history, and healthcare utilization. Symptomatic women also provided a pain history. Approval for the study was obtained from both the University of Medicine and Dentistry of New Jersey (UMDNJ) Institutional Review Board and Independent Research Consulting. The Henne Group, a survey research organization with expertise in sexual behavior interviewing studies, pre-tested the survey and implemented the final questionnaire using a listed sample of U.S. household telephone numbers and a Computer Aided Telephone Interviewing (CATI) system.

Households were screened for English-speaking females aged 18+ years; if multiple adult women resided in the home, the one with the most recent birthday (month/day, not year) was identified. Verbal consent was obtained, and potential subjects were screened for eligibility; those who met inclusion criteria received the full questionnaire. Women were excluded if they were pregnant, outside the 18–80 year age range, and/or reported an active sexually transmitted infection or active vulvovaginal infection. Women who reported genital pain as the result of ovarian cysts, uterine fibroids, cancer, and/or a sexually transmitted disease also were excluded. Those who self-identified with the 2000 ISSVD description of vulvodynia¹⁴ with symptoms lasting for six months or longer were classified as cases. The survey continued until 100 cases were identified. Controls were selected as 325 asymptomatic women frequency matched to cases according to age (18–24, 25–34, 35–44, 45–54, 55–64, and 65–80 years) and the four continental U.S. time zones. Response and cooperation rates were calculated according to American Association for Public Opinion Research (AAPOR) definitions.

Statistical significance was set at the 5% level. Putative causal variables that were significant in the univariate analysis were entered into a (stepwise) logistic regression model. Although subjects were frequency matched on age, control-to-case matching ratios were higher in the youngest and oldest age groups. Therefore, age was re-categorized into three groups and included in regression models to investigate the potential effect of age in the model. SPSS 11.0 was used for all analyses.

Results

From a listed sample of 7,062 phone numbers, 2,127 households were identified in which an adult English-speaking female resided. The study was explained to 1,558 (73%) women, and 81% ($n = 1,262$) consented to participate. Of the 1,012 women who met inclusion criteria, 3.85% ($n = 39$) withdrew consent for participation (Figure 1). Using AAPOR guidelines, a cooperation rate of 91.6% was obtained, indicating the proportion of eligible cases (after screening) that were interviewed.

Of the 1,012 eligible women, 100 (9.9%) reported vulvar symptoms consistent with vulvodynia. This population yielded a 3.8% ($n = 38$) current prevalence of chronic vulvar pain, defined as symptoms within the six months preceding the survey. Leading pain descriptors included burning (67%), itching (55%), and aching (43%). Women primarily believed their symptoms were caused by stress (39%) and yeast infections (35%). Common exacerbating factors included sexual intercourse (69%), pre-menses (42%), detergents and soaps (37%), toilet paper (35%), and tampons (34%).

The burden of illness of chronic vulvar symptoms was considerable. Because of vulvar pain, 25% of cases missed at least one day of work/school in the preceding 12 months, 27% reported a negative impact on work, 35% reported a negative impact on recreational activities, and 59% reported an overall compromised ability to enjoy life. Approximately 75% felt “out of control” of their body, and 50% felt “out of control” of their lives because of vulvar pain.

Similarly, chronic vulvar pain substantially impacted sexual experience, with 45% of cases indicating a moderate to severe overall impact on sex life. Vulvar pain caused 58% of cases to stop having sexual intercourse, and almost half of all cases avoided sexual relations because of their vulvar symptoms.

With the exception of a larger proportion of retired persons among the controls, there were no significant demographic differences between cases and controls (Table 1). Self-reported quality of life was lower and personal stress levels were higher in the cases, although the differences were not significant (Table 1). Cases were significantly more likely than controls to report chronic medical conditions (Table 2), including chronic fatigue syndrome (OR = 2.78), fibromyalgia (OR = 2.15), irritable bowel syndrome (OR = 1.87), and depression (OR = 2.99). They were also twice as likely to report irregular menstruation, painful menses, and premenstrual syndrome. Most notably, cases had six times the odds of reporting more than 3 urinary tract infections per year and four times the odds of more than 3 yeast infections annually as compared to controls. The remainder of obstetric and gynecologic history was similar for both groups. With the exception of cases being 1.8 times as likely as controls to see a specialist yearly, there were no significant univariate differences in healthcare utilization.

When variables with significant univariate associations with vulvodynia were entered in a logistic regression model, self-reported history of chronic urinary tract and yeast infections were the strongest predictors of chronic vulvar pain (Table 3). Regular tampon use and depression were also significant predictors. Age had no effect in the model.

Discussion

This national survey of non-pregnant, English-speaking women yielded a 9.9% lifetime prevalence and 3.8% current prevalence of vulvar pain, with reported symptoms consistent with other vulvodynia reports, including vulvar burning,^{7, 15–17} sharp vulvar pain,^{15, 18} dyspareunia,^{3, 7, 16, 19, 20} and pain with vestibular contact (e.g., tampon insertion, snug clothing, manual stimulation).^{15, 18} Like women with clinically diagnosed vulvodynia, cases in our study indicated that chronic vulvar pain substantially impacted their sexual life. Given

the national representation of participants and high cooperation rates, we believe that this is a good estimate of the frequency of vulvodynia symptoms in English-speaking U.S. women and that while this is a common health condition, it may not be as prevalent as previous reports have indicated. Additionally, because it was not possible to confirm the diagnosis using medical records or physical exams, the possibility exists that this estimate is even on the higher side of true prevalence. Conversely, the exclusion of women with active vulvovaginal infection might have biased the prevalence estimate downward, although fewer than 3% of interviewees were excluded on this basis.

Univariate analysis and multiple logistic regression consistently suggested a strong association of repeated (> 3 occurrences per year) urinary tract and yeast infections with chronic vulvar pain, the latter first noted by Friedrich in his 1987 report of vestibulitis patients.¹⁸ While there is no biologic mechanism to explain the relationship between these two conditions, the literature continues to support an association.^{18–22} Conversely, there is little information linking urinary tract infections and vulvodynia, and non-significant correlations have been reported.¹⁹ The possibility that women with recurrent pain are mistakenly assigned diagnoses of urinary tract or yeast infections solely on the basis of their presenting complaints (without laboratory confirmation) cannot be ruled out.

Although cases in our survey had a significantly increased odds of reporting several co-morbid chronic medical conditions, depression was the only disorder that remained strongly associated with vulvar pain in both univariate and multiple regression analysis, a finding consistent with previously reported data;^{22–28} however, the direction of association is uncertain, and longitudinal studies are needed to better understand this relationship. Associations found between menstrual complaints and chronic vulvar pain also warrant further consideration. The literature provides scant information on the correlation between the two, although it has been demonstrated that dysmenorrhea and premenstrual syndrome are more frequent in women with vulvodynia.²² Anecdotally, clinicians have suggested that hormonal changes play a role in chronic vulvar symptoms. Although the associations found in our study may simply represent women who have conditions other than vulvodynia, we suggest that the correlations between the two be examined; a focused menstrual history might be relevant in the differential diagnosis of unexplained chronic vulvar pain.

Overall, cases did not differ significantly from controls with regard to healthcare utilization, despite expectations to the contrary.¹⁶ However, as the case population in this study was identified from the general population, it is unlikely to over-represent women with a proclivity to seek medical care and may identify a less severely symptomatic group of women.

In summary, this survey of English-speaking U.S. women confirms the significant disruption of women's personal lives, including sexual function and overall quality of life, attributable to chronic vulvar pain. The condition, while prevalent, may not be as common as previously suggested. The results highlight the need to better understand this problem and to develop therapies (e.g., pharmacological interventions, surgery, dietary modification²⁹) that will provide consistent relief to afflicted women.

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Figure 1.
Calling disposition of 7,062 U.S. phone numbers.

Table 1

Demographics of 100 women with chronic vulvar pain (cases) and 325 asymptomatic women (controls).

	Cases (n = 100)	Controls (n = 325)
Quality of Life, mean^a (SD)	8.4	8.9
Stress level, mean^a (SD)	6.88	5.66
Age, y, No. (%)		
18 – 24	2 (2)	23 (7.1)
25 – 34	20 (20)	54 (16.6)
35 – 44	23 (23)	58 (17.8)
45 – 54	22 (22)	66 (20.3)
55 – 64	23 (23)	49 (15.1)
65 – 80	10 (10)	75 (23.1)
Employment Status^b, No. (%)		
Employed	69 (70.4) ^c	179 (57) ^c
Student/homemaker	11 (11.2)	45 (14.4)
Unemployed	4 (4.1)	17 (5.4)
Retired	14 (14.3) ^c	73 (23.2) ^c
Relationship Status^d, No. (%)		
Single, never married	12 (12)	42 (13)
Divorced/separated	12 (12)	31 (9.6)
Widowed	7 (7)	26 (8)
Married/marriage-like relationship	69 (69)	224 (69.3)
Education, No. (%)		
High school or less	27 (27)	99 (30.5)
Some college/associate's degree	26 (26)	105 (32.3)
College degree	29 (29)	82 (25.2)
Graduate degree	18 (18)	38 (11.7)
Other	0 (0)	1 (0.3)
Overall Health, No. (%)		
Excellent	19 (19)	81 (24.9)
Very good	41 (41)	116 (35.7)
Good	25 (25)	87 (26.8)
Fair	11 (11)	34 (10.5)
Poor	4 (4)	7 (2.2)
Race, No. (%)		
White	83 (83)	271 (83.4)
Black	7 (7)	25 (7.7)
Asian	1 (1)	4 (1.2)
Native American/Alaskan	0 (0)	6 (1.8)
Hawaiian/Pacific Islander	1 (1)	2 (0.6)
Other	8 (8)	17 (5.3)

	Cases (n = 100)	Controls (n = 325)
Ethnicity, No. (%)		
Hispanic	4 (4)	13 (4)

^a Self-reported on a scale of 1 (worst possible) to 10 (best possible)

^b n = 98 cases, n = 314 controls

^c Difference significant at $p < 0.05$

^d n = 323 controls

Table 2

Univariate analysis comparing characteristics of 100 women with chronic vulvar pain to 325 asymptomatic women.

Characteristics	Cases (n=100), No. (%)	Controls (n=325), No. (%)	Odds Ratio (95% Confidence Interval)
Depression	46/100 (46)	72/325 (22)	2.99 ^a (1.87 – 4.80)
Irritable Bowel Syndrome	24/98 (24.5)	48/323 (15)	1.86 ^a (1.07 – 3.23)
Chronic fatigue	13/100 (13)	16/323 (5)	2.87 ^a (1.33 – 6.19)
Fibromyalgia	14/99 (14.1)	23/323 (7.1)	2.15 ^a (1.06 – 4.36)
> 3 urinary tract infections/year	37/100 (37)	28 (8.7)	6.15 ^a (3.51 – 10.77)
> 3 yeast infections/year	34/98 (35)	36/323 (11)	4.24 ^a (2.47 – 7.28)
History of irregular menstruation	55/100 (55)	122/324 (38)	2.02 ^a (1.29 – 3.19)
History of painful periods	76/100 (76)	207/322 (64.3)	1.76 ^a (1.05 – 2.94)
Pre-menstrual Syndrome	65/98 (66)	157/317 (50)	2.01 ^a (1.25 – 3.22)
Used tampons regularly ^b	81/99 (81.8)	217/320 (67.8)	2.14 ^a (1.22 – 3.75)
> 1 lifetime sexual partner ^b	77/99 (77.8)	199/309 (64.4)	1.94 ^a (1.14 – 3.28)
Intercourse in the last 6 months	72/100 (72)	209/314 (66.6)	1.29 (0.79 – 2.12)
History of oral contraceptive use	76/100 (76)	235/325 (72.3)	1.21 (0.72 – 2.04)
History of pregnancy	82/100	274/325	0.85 (0.47 – 1.53)
Hormone therapy (other than birth control)	43/100	117/323	1.33 (0.84 – 2.10)
Menopausal	49/92	137/312	1.28 (0.81 – 2.01)
Hysterectomy	31/100	84/325	1.29 (0.79 – 2.11)
See OB/GYN at least 1x/year ^b	83/99	251/322	1.47 (0.81 – 2.66)
See specialist at least 1x/year ^b	57/99	138/325	1.84 ^a (1.17 – 2.9)
Seen mental health provider in last year	14/100	26/325	1.87 (0.94 – 3.74)
Missed work/school in last year ^b	67/99	203/321	1.22 (0.75 – 1.96)
Health insurance	85/99	286/322	0.76 (0.39 – 1.48)
College degree or higher ^b	47/100	120/324	1.51 (0.96 – 2.37)
Employed ^b	69/98	179/314	1.79 ^a (1.10 – 2.92)

^aSignificant at p < 0.05^bVariable was assessed categorically and recoded into a dichotomous variable

Table 3

Predictors of vulvodynia symptoms as identified through backward stepwise logistic regression, using a combination of all variables identified as significant ($p < 0.05$) by univariate analysis.^a

Variable	Odds Ratio (95% Confidence Interval)	p-value
Self-reported history of depression	1.93 (1.08 – 3.46)	0.026
Painful menses	1.80 (0.95 – 3.41)	0.07
Chronic urinary tract infections (> 3/year)	6.23 (3.17 – 12.26)	0.000
Chronic yeast infections (> 3/year)	3.33 (1.73 – 6.41)	0.000
> 1 lifetime sexual partner	1.72 (0.91 – 3.26)	0.097
History of regular tampon use	2.29 (1.14 – 4.61)	0.020
Constant	0.007	0.000

^a All significant variables identified by univariate analysis ($p < 0.05$) were included in this backward stepwise logistic regression procedure: self-reported history of depression, irritable bowel syndrome, chronic fatigue syndrome, fibromyalgia, painful menstruation, irregular menstruation, pre-menstrual syndrome, chronic urinary tract infections (≥ 3 /year), chronic yeast infections (≥ 3 /year), history of regular tampon use, more than one lifetime sexual partner, employment status (employed vs. unemployed), and at least one visit to a mental health specialist in the 12 months preceding the survey. Regular tampon use, sexual partner history, and employment status were recoded from categorical variables into dichotomous variables for the purpose of analysis. A total of $n = 90$ cases and $n = 274$ controls were included in the regression analysis; $n = 10$ cases and $n = 49$ controls were excluded because of missing data. Hosmer Lemeshow p -value = 0.717.