Is Chronic Stress During Childhood Associated with Adult-Onset Vulvodynia?

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Abstract

Background: Vulvodynia is an unexplained chronic vulvar pain condition. Case-control studies provide opportunities to examine potential mechanisms by which vulvodynia may develop. Findings inform etiological models that can be tested in subsequent prospective studies.

Methods: A survey of interpersonal relationships and the *Structured Clinical Interview for DSM-IV Axis I Disorders* was administered to 215 case-control pairs of women with and without vulvodynia. Conditional logistic regression was used to examine associations between affect-based chronic stressors (i.e., living in fear of abuse, perceived abuse, and antecedent mood disorders) with vulvodynia. These associations were then examined among women with and without a history of childhood abuse.

Results: Among women with a history of severe childhood abuse, those with vulvodynia had three times the odds of living in fear of any abuse compared to women without vulvodynia (95% confidence interval: 1.0, 11.0), after adjustment for childhood poverty. Among women with no history of childhood abuse, those with vulvodynia had over six times the odds of antecedent mood disorder compared to women without vulvodynia (95% confidence interval: 1.9, 19.6).

Conclusion: Our findings suggest that affect-based chronic stressors may be important to the psychobiological mechanisms of vulvodynia. Prospective studies are recommended to test biopsychosocial models of the etiology of vulvodynia.

Introduction

VULVODYNIA, AN UNEXPLAINED chronic vulvar pain condition, may now impact up to one in four women in the United States at some point in their lives.¹ In a previous publication, we identified women from the general population suffering from this disorder: when compared with similarly aged controls, we observed a strong association between childhood victimization (physical and/or sexual abuse) and the onset of vulvodynia.² Other negative experiences during childhood (i.e. living in fear of abuse, perceiving danger in one's home, school, or community) were also associated with the onset of vulvodynia.² We further demonstrated that women with vulvodynia had a greater odds of meeting criteria for a mood disorder (depression and/or anxiety) than those without vulvodynia.³ These published findings are consistent with previous studies which show that women who have adverse childhood experiences are more likely than their non-exposed peers to develop physical and psychiatric problems throughout their lifespan.^{4–11}

In the retrospective analyses that we present in this paper, we estimated the odds of childhood abuse (physical and/or sexual), odds other negative psychosocial experiences during childhood (i.e., living in fear of abuse, perceived danger), and history of mood disorder in relation to adult-onset vulvodynia within a larger population- and clinic-based sample of women than previously studied. In addition, we examined whether affect-based chronic stressors (i.e., living in fear of any abuse, perceived danger, and mood disorders) are associated with vulvodynia within subsets of women who have reported no childhood abuse, moderate abuse, or severe abuse. We conceptualize mood disorder as a chronic stressor because impairment in functioning over an extended period of time is part of its diagnostic criteria,¹² and because mood disorder is associated with physiological dysregulation.¹³ We sought to determine whether the odds of affect-based chronic stressors differed among women with and without vulvodynia in the absence as opposed to the presence of childhood physical and/or sexual abuse.

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Materials and Methods

This study was approved by Human Subjects Research Committees at Brigham and Women's Hospital and the University of Minnesota. Written informed consent was obtained from all participating women.

Target population

Using Massachusetts Town Books (annual census publications that list residents by name, age, and address), 450 women ages 18–64 were randomly selected each month for 55 months from 3 ethnically diverse Boston neighborhoods and 6 suburban communities (defined geographically by ZIP code). Details pertaining to this sampling and screening protocol can be found elsewhere.¹⁴ A short questionnaire assessed whether women in the general population had experienced chronic vulvar pain (burning; knife-like sharp pain; or pain on contact during intercourse, at the time of tampon insertion, or during a pelvic exam) for 3 months or longer. After three mailings and telephone follow-up, 12,435 (67.2%) women completed the screening questionnaire (Fig. 1). The mean age of responders and non-responders was identical. Of 12,435 women who returned the questionnaire, 662 self-reported chronic vulvar pain and were eligible for further screening as potential vulvodynia cases. We excluded

1,851 women who reported chronic itching and/or other non-vulvodynia related symptoms. The remaining 9,922 women with no history of vulvar pain symptoms constituted the pool of eligible controls.

Selection of cases and controls

Women with symptoms consistent with a diagnosis of vulvodynia ($n = 662$; see Fig. 1) were asked to participate in a telephone interview to rule out the presence of other diagnosable vulvar conditions (i.e., sexually transmitted diseases, yeast/bacterial infections, vulvar skin problems, etc.). Of these, 444 (67.1%) agreed to complete the telephone assessment, and 256 women were selected as eligible cases by our clinical expert coauthor (EGS).

A free pelvic examination that applied Friedrich's diagnostic criteria¹⁵ was offered to all eligible cases for diagnostic confirmation. For localized vulvodynia, cases were clinically confirmed by absence of signs or symptoms of known causes of vulvar pain and by the presence of pain on touch by a cotton swab in the vestibule. For generalized vulvodynia, cases were clinically confirmed by absence of signs or symptoms of known causes of vulvar pain and by the patient's description of burning, stinging, pain, or rawness with or without allodynia in the affected area. Localized and generalized cases of vulvodynia were combined.

FIG. 1. Flow chart of general population screening by which cases and controls were identified from the Boston Metropolitan area in the years 2000–2005. *An additional 56 cases from a clinic specializing in vulvovaginal disorders were included in the current analysis.

Seventy-three cases (38%) from the general population agreed to the clinical examination and 56 (77%) were clinically confirmed as vulvodynia. The remaining 17 had no disorder ($n=3$), lichen sclerosis ($n=2$), vaginal infections ($n=2$), pelvic pain disorder ($n=8$), vaginismus ($n=1$), or irritable bowel syndrome ($n=1$) and were excluded. General population cases who did not agree to the clinical examination, but who were still interested in participating, remained enrolled in the study ($n=121$). To augment the number of vulvodynia cases, 65 additional women were enrolled from a clinic specializing in vulvovaginal disorders. Thus, our pool of cases comprised 121 clinically confirmed (56 from the general population and 65 from a vulvovaginal specialty clinic) and 121 nonclinically confirmed.

Of these 242 cases, 27 were excluded due to incomplete information regarding childhood abuse, psychosocial experiences, or psychiatric diagnoses, which were necessary for the current analyses. The resulting 215 cases consisted of 108 nonclinically confirmed and 107 clinically confirmed. All but two cases reported age at first onset of vulvar pain as 12 or later. Of the 9,922 women who self-reported no history of chronic vulvar pain symptoms, 520 women were contacted for interview (Fig. 1). For each case, we randomly selected a control within 5 years of age of the case from the same community. Once age-matched, a "reference age" was assigned to the control, identical to the age at first onset of chronic unexplained vulvar pain in her matched case. This reference age was used to assign mood and anxiety disorders as antecedent to the onset of vulvodynia in the case and a comparable time point in the matched control. A total of 215 matched controls were utilized in the current analyses.

Assessment of childhood abuse and negative psychosocial experiences

Childhood abuse, other negative psychosocial experiences (fear of abuse, perceived danger of abuse) and mood disorders (depression and anxiety) were assessed in the 215 cases and matched controls using a survey of interpersonal relationships¹⁶ and the *Structured Clinical Interview for DSM-IV* [Diagnostic and Statistical Manual of Mental Disorders, fourth edition] *Axis I Disorders* (SCID).¹² We adjusted for childhood poverty based on (1) whether the participant's family did not have enough money to pay for food, had to borrow money for medical expenses, did not have enough money to meet expenses, or received public assistance during the participant's childhood; (2) the work status of the primary wage earner; and (3) whether the home was owned when the participant was a child.

Childhood abuse was assessed using a 73-item questionnaire developed by researchers from Brown University, the Harvard School of Public Health, and Brigham and Women's Hospital.¹⁶ Items were derived from the Conflict Tactics Scale and the Pregnancy Abuse Assessment Screen,^{17,18} widely recognized as representing a broad spectrum of abuse.

Women selected the category that best described the frequency of exposure during childhood (defined to participants as younger than 12 years) using the responses "never," "a few times or less," or "more than a few times." Physical abuse included the experience of being (1) pushed, grabbed, or shoved; (2) injured by objects thrown; (3) kicked, bit, or

punched; (4) hit with a hand or fist; (5) choked or burned; or (6) physically attacked in some other way. We classified women "severely" physically abused if they (a) were ever choked, burned, or physically attacked, or (b) responded to any other item more than a few times. All other abuse was considered "moderate." Women separately indicated whether they had lived in fear of events 1–6, above, and we used the same algorithm to classify women as living in moderate or severe fear of physical abuse. Sexual abuse was classified as being sexually assaulted never, a few times or less, or more than a few times. Women separately reported fear of sexual assault and fear of having to be sexual against her will. We considered women to be severely sexually abused or living in severe fear of sexual abuse if any item was answered "more than a few times." Sexual abuse or fear of abuse a few times or less was considered moderate. The highest level of reported physical or sexual abuse (or feared abuse) was used to create two composite categorical variables: any abuse and fear of any abuse. We categorized the source of physical and/or sexual abuse as parent, other family, or nonfamily members. We also counted the number of listed perpetrators. Finally, we inquired whether respondents felt in danger at home, at school, or in their neighborhood during childhood.

Assessment of depression and anxiety

Psychiatric history was assessed using the SCID.¹² The SCID is recognized as the "gold standard" in diagnosing major Axis I psychiatric disorders.¹² For the purposes of this study, women were characterized as having a mood disorder if they met DSM criteria for major depressive disorder or dysthymia (chronic low levels of depression). Consistent with standard SCID procedures, participants were asked whether they had experienced "a two-week period of feeling depressed or down most of the day nearly every day," or had "ever lost interest or pleasure in things that they usually enjoyed." If subjects answered yes to either of these two screener questions, seven additional questions pertaining to sleeping habits, restlessness, fatigue, self-worth, ability to concentrate, appetite, and suicidal thoughts were administered. Age at first onset of each of these symptoms was assessed as well. If a participant responded affirmatively to five or more symptoms (including the screening questions), impairment was then assessed and if compromised, she was initially defined as having experienced major depression and assigned an age at first onset. New onset dysthymia was diagnosed according to DSM criteria as long as the participant met criteria for this disorder over a 2-year period.

Women with scores that indicated a history of panic, general anxiety disorder, post-traumatic stress disorder, obsessive-compulsive disorder, social phobia, and/or agoraphobia were categorized as having an anxiety disorder. All interviewers were trained through in-person workshops that included video training procedures. Psychiatric colleagues with whom Dr. Harlow has worked for over 15 years in many of his ongoing studies initiated the training and were used to review SCIDs of subjects meeting DSM psychiatric criteria.

By utilizing the SCID, the age at first onset of depression and anxiety was established. Along with the reported age at first onset of vulvar pain, we were able to determine the

temporal association between psychiatric disorders and vulvodynia. All cases and controls had complete information related to mood and anxiety disorders.

Statistical analysis

Conditional logistic regression was used to examine associations between affect-based chronic stressors (i.e., living in fear of abuse, perceived abuse, and antecedent mood disorders) with vulvodynia. Unconditional logistic regression tested whether the odds of affect-based chronic stressors (fear of any abuse, perceived danger of any abuse and antecedent mood disorder) differed between women with and without vulvodynia across strata of childhood abuse history. Poverty during childhood was included as a covariate in all conditional logistic regression models due to its potential association with vulvodynia onset, childhood abuse and mood disorder. To address the potential misclassification of the vulvodynia diagnosis, sensitivity analyses were performed in which analyses were repeated, restricting the sample only to clinically confirmed cases and their matched controls. We provide the sensitivity analysis odds ratios and confidence intervals for novel results and/or indicate whether this restriction changed any of our odds estimates.

Results

Women with and without vulvodynia were similar by age (due to matching), race, religion, education, work status of the main wage earner when the participant was a child, and childhood family home ownership (Table 1). Cases were slightly more likely than controls to report childhood poverty (20% versus 15%, respectively).

Women with vulvodynia had roughly three times the odds of experiencing any severe childhood abuse or living in severe fear of any abuse as a child compared to women with no vulvodynia (Table 2). This pattern of association was also observed for specific childhood abuse types (physical, sexual). Also, women with vulvodynia had twice the odds of identifying one or multiple perpetrators in comparison to women without vulvodynia. Women with vulvodynia were at two to three times the odds of reporting any feelings of danger, and as previously reported, 3 women with vulvodynia were at five times the odds of reporting antecedent depression and/or anxiety than women without vulvodynia (95% confidence interval [CI]: 2.5, 9.8). The magnitude of these associations remained largely unchanged when we restricted the analyses to the subgroup of clinically confirmed cases of vulvodynia and their matched controls.

Across the subsets of women who experienced no childhood physical and/or sexual abuse, moderate abuse, or severe abuse, there was a gradient in the magnitude of the associations between vulvodynia and living in fear of any abuse as a child and vulvodynia and having a history of antecedent mood disorders (Table 3). A test for heterogeneity of these odds ratios was not significant and thus we cannot rule out chance as explaining these divergent odds ratios. Nevertheless, among women who reported no history of childhood abuse (physical and/or sexual), only a small proportion of women reported living in fear of abuse as a child and its association with vulvodynia was modest at best. In contrast, among women who reported a history of severe childhood abuse, abused women with vulvodynia had three times the odds of living in fear of any abuse

TABLE 1. STUDY POPULATION DEMOGRAPHICS

	Cases (n = 215)	Controls (n = 215)
Interview age		
< 30	34.0%	34.0%
30–39	28.4%	27.9%
40–49	23.7%	24.7%
≥ 50	14.0%	13.5%
Reference age ^a		
< 20	29.8%	30.7%
20–24	25.1%	24.2%
25–30	19.1%	20.0%
> 30	26.1%	25.1%
Race		
Caucasian	92.1%	87.0%
Hispanic	4.2%	3.3%
African American	1.9%	7.0%
Other	1.9%	2.8%
Religion		
Catholic	51.2%	57.2%
Jewish	14.9%	14.0%
Protestant	15.8%	13.0%
Other	18.1%	15.8%
Education		
Some college or less	23.7%	29.3%
College graduate	44.7%	40.0%
Graduate school	31.6%	30.7%
Main wage earner ^b		
Owned business	56.3%	57.2%
Worked	32.1%	28.4%
Unemployed	8.4%	10.2%
Other	1.9%	2.3%
Unspecified	1.4%	1.9%
Family home ownership during childhood		
Yes	79.1%	77.7%
Childhood poverty ^{c,d}		
Yes	20%	14.9%

^aAge at first onset of vulvar pain symptoms for cases and matched reference age for controls to ensure comparable exposure assessments.

^b“Main wage earner” refers to the primary wage earner when participant was a child.

^cChildhood poverty was defined as on at least two occasions, participant’s family did not have enough money to pay for food, had to borrow money for medical expenses, did not have enough money to meet expenses, or received public assistance.

^dDifferences significant at $p < 0.05$.

as a child compared to abused women without vulvodynia (95% CI: 1.0, 11.0; sensitivity analysis: odds ratio [OR] = 3.3; 95% CI: 0.9, 14.2).

The association between vulvodynia and mood disorders showed a different pattern across childhood abuse exposures. Among women who reported no history of childhood abuse (physical and/or sexual), nonabused women with vulvodynia had more than six times the odds of antecedent mood disorders compared with nonabused women without vulvodynia (95% CI: 1.9, 19.6; sensitivity analysis: OR = 5.6; 95% CI: 0.7, 24.8). The magnitude of this association weakened to statistical nonsignificance among women with a history of severe abuse.

The observed associations of living in fear, perceived danger, and mood disorders with vulvodynia among women having experienced moderate abuse fell between those

TABLE 2. AFFECT-BASED CHRONIC STRESSORS AND THE RISK OF ADULT-ONSET VULVODYNIA

	<i>Cases (n=215)</i>	<i>Controls (n=215)</i>	<i>Crude OR</i>	<i>Adjusted OR [95% CI]^a</i>
Physical abuse				
None	31.1%	40.0%	1.0	1.0
Moderate	47.0%	49.8%	1.2	1.2 [0.8, 2.0]
Severe	21.9%	10.2%	2.5	2.4 [1.3, 4.4]
Fear of physical abuse				
None	59.4%	80.4%	1.0	1.0
Moderate	25.4%	14.0%	2.1	2.1 [1.3, 3.5]
Severe	14.6%	6.5%	2.9	3.0 [1.4, 6.2]
Sexual abuse				
None	87.0%	92.5%	1.0	1.0
Moderate	8.4%	6.5%	1.4	1.4 [0.7, 2.9]
Severe	4.7%	0.9%	9.3	9.7 [1.2, 79.1]
Fear of sexual abuse				
None	89.8%	94.0%	1.0	1.0
Moderate	5.1%	5.1%	1.0	1.1 [0.4, 2.5]
Severe	5.1%	0.9%	^b	^b
Any abuse ^c				
None	28.8%	38.1%	1.0	1.0
Moderate	47.9%	51.6%	1.2	1.2 [0.8, 1.8]
Severe	23.3%	10.3%	2.7	2.9 [1.5, 4.8]
Lived in fear of any abuse ^{c,d}				
None	58.1%	76.7%	1.0	1.0
Moderate	25.6%	16.7%	1.8	1.8 [1.1, 2.9]
Severe	16.3%	6.5%	3.4	3.5 [1.6, 7.2]
Perpetrator of any abuse ^c				
No perpetrators	23.7%	35.8%	1.0	1.0
Nonfamily	21.4%	12.6%	2.6	2.7 [1.4, 5.1]
Other family	20.5%	14.9%	1.9	1.9 [1.1, 3.3]
Parent	14.9%	10.7%	2.1	2.0 [1.0, 4.0]
Not reported	19.5%	26.1%	1.1	1.1 [0.6, 1.0]
Number of perpetrator types of any abuse ^c				
No perpetrators	23.7%	35.8%	1.0	1.0
One perpetrators	37.7%	26.1%	2.1	2.0 [1.2, 3.3]
Multiple perpetrators	19.1%	12.1%	2.4	2.4 [1.3, 4.5]
Unknown sources	19.5%	26.1%	1.0	1.1 [0.6, 1.0]
Felt danger				
Any feelings of danger	33.5%	16.3%	2.5	2.5 [1.5, 4.0]
Felt danger				
In the home				
Yes	23.3%	11.6%	2.4	2.3 [1.4, 4.1]
In neighborhood				
Yes	14.4%	7.9%	2.0	1.7 [0.8, 3.2]
At school				
Yes	9.3%	3.3%	3.2	2.9 [1.1, 7.3]
Mood disorders				
Any diagnosis	26.1%	8.4%	4.8	4.9 [2.5, 9.8]

^aAdjusted for poverty during childhood.^bAny childhood physical and/or sexual abuse.^cOnly four cases and three controls reported fear and no abuse.^dEffect could not be estimated due to small cell counts for stratum.

CI, confidence interval; OR, odds ratio.

observed for women with no history of abuse and women with a history of severe abuse.

Discussion

To our knowledge, this is the first study to utilize a large population-based and clinic-based sample of women to ex-

amine the associations between affect-based chronic stressors and vulvodynia within subsets of women who have experienced no childhood physical and/or sexual abuse, moderate abuse, or severe abuse. Two novel findings emerged. First, living in fear of abuse as a child and its association with vulvodynia may vary depending upon the severity of the victimization itself. Second, having a mood disorder may be

TABLE 3. AFFECT-BASED CHRONIC STRESSORS, MOOD DISORDERS, AND THE RISK OF VULVODYNIA WITHIN CHILDHOOD ABUSE GROUPS (N=430)

	<i>No abuse^a</i>			<i>Moderate abuse^a</i>			<i>Severe abuse^a</i>		
	<i>Cases (n=62)</i>	<i>Controls (n=82)</i>	<i>Adjusted OR [95% CI]^b</i>	<i>Cases (n=103)</i>	<i>Controls (n=111)</i>	<i>Adjusted OR [95% CI]^b</i>	<i>Cases (n=50)</i>	<i>Controls (n=22)</i>	<i>Adjusted OR [95% CI]^b</i>
Lived in fear of any abuse									
No fear	93.5%	96.3%	1.0	58.3%	71.2%	1.0	14.0%	31.8%	1.0
Any fear	6.5%	3.7%	1.7 [0.4, 7.9]	41.7%	28.8%	1.8 [1.0, 3.2]	86.0%	68.2%	3.2 [1.0, 11.0]
Perceived danger									
No feelings of danger	88.7%	95.1%	1.0	68.0%	82.0%	1.0	36.0%	50.0%	1.0
Feelings of danger	11.3%	4.9%	2.3 [0.7, 8.4]	32.0%	18.0%	2.2 [1.1, 4.2]	64.0%	50.0%	1.9 [0.6, 5.4]
Mood disorders									
No disorder	75.8%	95.1%	1.0	78.6%	91.9%	1.0	62.0%	77.3%	1.0
Diagnosed disorder	24.2%	4.9%	6.1 [1.9, 19.6]	21.4%	8.1%	3.1 [1.3, 7.1]	38.0%	22.7%	2.4 [0.7, 7.9]

^aAny childhood physical and/or sexual abuse.^bAdjusted for poverty during childhood.

associated with the development of vulvodynia in the absence of childhood abuse. Below, we consider each of these findings in the context of the broader literature on chronic stress and inflammation.

Among women who were more severely abused as children, living in fear of abuse was more strongly associated with vulvodynia than that observed in women reporting no history of childhood abuse. Fear of abuse and perceived danger are both appraisals of threat. However, within a population of women who were already severely abused as a child, those with vulvodynia had three times the odds of living in fear of abuse than women with no vulvar pain history. Fear is described as an emotional state that involves physiological arousal that motivates cognitive, affective, and behavioral responses directed towards alleviating the threat.¹⁹ Fear, rather than physical insult, may be a mechanism by which physical and sexual abuses are associated with vulvodynia. Chronic stress has been shown to dysregulate the body's hypothalamic-pituitary-adrenal axis (HPAA) and immune systems, which play a significant role in the body's adaptation to stress.^{5,8–10,20–27} When these systems are overtaxed or managed ineffectively, pathophysiological processes may lead to inflammation in various parts of the body.^{20,27} In addition, psychiatric symptoms resulting from chronic stress and a heightened sense of vigilance or perceived danger may both overtax the body's HPAA and immune systems.^{5,22,23,27} A number of scientists have posited that vulvodynia may be the result of an altered immunoinflammatory response.^{2,3,28–31} If psychosocial risk factors associated with vulvodynia (e.g., childhood abuse) lead to a compromised immune system, this mechanistic pathway would be consistent with the broader, growing literature on the role of chronic stress in generating inflammation.^{32,33} Childhood fear of abuse could be conceptualized as a chronic stressor. Women who lived in fear as children may have ruminated about past instances of abuse and dreaded the possible reoccurrence of abuse. Rumination has been linked with endocrine and immunologic activation and dysregulation.³⁴

Our second novel finding involved the association between mood disorders and the development of vulvodynia. Interestingly, having a history of mood disorder conferred a modest nonsignificant association with vulvodynia among women who reported severe childhood abuse. It is possible

that physiological systems of these women were already “tested” by having to cope with severe childhood abuse.^{35,36} In contrast, having a mood disorder was significantly associated with the development of vulvodynia among women who reported no history of childhood abuse. The physiological systems of these women may not have been “tested” until women developed a mood disorder. Our findings, as well as the broader literature, support the conceptualization of mood disorder as a chronic stressor in terms of its potential for generating or exacerbating physiological dysregulation.

Although we observed that mood disorder was an antecedent factor associated with vulvodynia, we cannot rule out that both mood disorders and vulvodynia may occur through common immunoinflammatory mechanisms. Associations between depression and inflammation have been observed among adults in several community-based studies,^{37–40} and our epidemiological results have shown a number of inflammatory-related factors, such as infections and allergenic exposures, to be associated with vulvodynia as well. Lastly, it is also possible that a “third variable” explanation could account for the association between antecedent mood disorder and vulvodynia. Genetic propensity towards inflammation, for example, could influence both the likelihood of developing depression and vulvodynia.⁴¹

Our findings should be considered in light of the study's limitations. Some women may have inaccurately recalled the timing of abuse and details related to the kinds of abuse they experienced, which would lead to some misclassification. It is also possible that women with vulvodynia may have been more likely than women without vulvodynia to recall abuse, fear of abuse, and levels of severity. We can also not rule out that women with vulvar pain may have differentially recalled their psychiatric history compared to matched controls. However, structured clinical interviews such as the SCID contribute less recall bias than unstructured interviews and self-reported measures.⁴² Outcome misclassification is also possible. However, we performed sensitivity analyses to address possible misclassification of the vulvodynia diagnosis and observed similar results in analyses restricted to subgroups of clinically and nonclinically confirmed cases and their matched controls. Nevertheless, future studies should attempt to include only clinically confirmed cases. In addition, for 2 of the 215 cases we were not able to determine

whether abuse was antecedent to the onset of vulvar pain. After restricting analyses to those 213 cases with age at vulvodynia onset of 12 or greater (and matched controls with the same reference age), the results remained the same. Combining generalized and localized vulvodynia could have possibly made it more difficult for us to detect associations between affect-based chronic stressors and vulvodynia. However, if affect-based chronic stressors are associated with only one type of vulvodynia, then combining the two types of vulvodynia would by definition weaken our results. Thus, our findings might be stronger than reported. Whether our findings are specific to a subtype of vulvodynia could certainly be examined in future research. Finally, more precise estimates may be obtained through studies utilizing a larger number of cases and controls, or conceivably, prospective studies of childhood trauma and indicators of vulvar pain onset. The heterogeneity of the odds ratios we observed across levels of childhood victimization did not reach statistical significance and thus we are cautious in our interpretation of these findings.

In summary, our findings suggest that affect-based chronic stressors may be important to the psychobiological mechanisms of vulvodynia. Specifically, living in fear of childhood abuse and coping with a mood disorder may contribute to the onset of vulvodynia. Prospective studies are recommended to inform the viability of this potential causal hypothesis. Understanding the different mechanisms by which vulvodynia may develop is critical to prevention. A better understanding of the mechanisms of vulvodynia may also assist health care providers in treating women who have been diagnosed with the condition. Women diagnosed with vulvodynia often desire information and struggle to explain their chronic pain to others.⁴³ A promising area of future research is the utilization of biomarkers to investigate psychobiological mechanisms of inflammation in relation to the onset of vulvodynia. Biomarkers may conceivably be used to identify subsets of women who could benefit from specific treatments. Thus, developing and testing biopsychosocial models of the pathogenesis of vulvodynia holds great promise for the prevention and treatment of this highly prevalent chronic pain condition.

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