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When sex is always painful: Provoked vestibulodynia

There is increasing evidence that provoked vestibulodynia is associated with central sensitization of the pain circuits within the brain and spinal cord, and that small-group psychoeducation programs can help women with this distressing condition.

ABSTRACT: Chronic dyspareunia affects up to 15% of premenopausal women, seriously harming mental health and relationships. Pain with intercourse or vaginal penetration is most commonly due to provoked vestibulodynia. Stress has been found to alter pain thresholds and contribute to central sensitization by affecting the circuitry in the top-down modulation of pain from brain to dorsal horn cells. Women with provoked vestibulodynia have lower pain thresholds in nongenital sites when compared with control subjects, and comorbidity with other chronic pain syndromes is common. Even though provoked vestibulodynia can be confirmed through physical examination and the sexual and pain symptoms are characteristic, diagnosis is typically delayed unduly. The increasing stress of living with this condition compounds initiating stressors: central sensitization is enhanced and painful sex continues. Small-group programs providing psychoeducation and cognitive behavioral therapy or mindfulness-based cognitive therapy have been found to ameliorate the pain and suffering from provoked vestibulodynia. While benefit from medications is similar to placebo, in individual cases some medical treatments may be considered in addition to cognitive therapy. Physicians may wish to refer patients to the BC Centre for Sexual Medicine for a full diagnostic assessment and small-group treatment.

Sexual health information available to young women in British Columbia is unlikely to include their one-in-five risk of consistently experiencing pain from intercourse or other penetrative forms of sex.[1] Nor are they likely to learn that chronic dyspareunia affects up to 15% of all premenopausal women and is most commonly due to provoked vestibulodynia (PVD).[2]

Despite inclusion of PVD as a topic in undergraduate, postgraduate, and continuing medical education programs, we are sad to report that women are still misdiagnosed, dismissed, prescribed ineffective remedies, or told that their condition is untreatable. We are grateful for this opportunity to provide a brief review of PVD that emphasizes how recent research into the pathophysiology

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of chronic/recurrent pain is guiding current effective management of this highly distressing pain.

Definition

Provoked vestibulodynia is currently defined as "provoked vestibular pain of at least 3 months duration, without clear identifiable cause, which may have potential associated factors."[3] The diagnosis of PVD is suggested by the patient's history and confirmed by simple physical examination.

In this chronic pain condition there is allodynia (pain from non-noxious stimuli, in this case touch or pressure) of all or part of the outer edge of the vestibule. The vestibule is defined as the area of the vulva containing the openings of the urethra and vagina, the hymenal tags, and the inner edge of the inner surfaces of the labia minora out to Hart's line. The latter is the visible junction between regular vulvar skin and its smoother transitional surface abutting the hymenal circumference. Touch to neither the vaginal mucosa nor to the outer parts of the labia minora elicits pain. There are no abnormal signs: erythema at the site of the most intense allodynia—the innermost crease between the outer hymenal edges and the inner edge of the labia minora—is variable and not diagnostic.

Symptoms

In women with lifelong PVD, intercourse or other penetrative sex has always been painful, while women with acquired PVD may have had months or possibly many years of painless intercourse. The pain is described as burning, stinging, or cutting at the entrance to the vagina. The precise location is difficult for many women to identify, and although the pain is elicited by touching the introital edge, women may feel pain deeper within the vagina. When pleasure and arousal are experienced despite the pain of penetration, the intensity of the pain can lessen as intercourse proceeds, but more often it increases. Typically there is postcoital burning and often postcoital dysuria. Both can last hours or even days. Contact with ejaculation fluid may cause burning pain. Nonsexual touch, including tampon or speculum insertion, may also elicit pain.

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Physical examination

A woman with PVD may never have experienced intercourse or even a routine pelvic exam because protective involuntary pelvic muscle tightening made these impossible. It is especially important to describe the limited nature of the physical examination to a woman with this condition and it may be preferable to defer the examination to a second visit so that she has time to practise being able to open her labia. The examination should begin with the physician touching the outer areas of the labia minora to give the woman a baseline sense of the normal feeling experienced when a Q-tip with cold gel touches her genitalia. The physician can then gently touch the surface of the vestibule with the Q-tip, particularly the crease around the outer edge of the hymen where the allodynia is concentrated. Women who are particularly anxious may find it easier to do the Q-tip test themselves with the assistance of the physician and the use of a handheld mirror.

As well as completing the Q-tip test for allodynia, the physician must exclude other vulvar or vaginal pathology, including infection and dystrophy, and examine any areas of visible abnormality that may require biopsy. If there is an element of deep pain, other possible comorbid conditions, including endometriosis, should be ruled out.

The ability to tighten the muscles around the vagina (Kegel maneuver) is often compromised in PVD, as is the ability to voluntarily relax the perineum fully. Sometimes the woman is not able to permit an examination of muscles around the vagina until there is some lessening of the severity of the allodynia. To the examining finger, the tone of the superficial and deeper perivaginal muscles is typically heightened, and palpating these

muscles may identify tenderness: palpating the insertion of these muscles into the ischial spines typically elicits pain that may be referred elsewhere in the pelvis. Although abnormalities in muscle tone are typical, they are not diagnostic of PVD, nor is detecting them essential to confirm the diagnosis.

Although women presenting with PVD are typically in their late 20s, the condition is not limited to premenopausal women: a second smaller peak of prevalence occurs soon after menopause, when there may be comorbid atrophy due to low estrogen levels. To be certain of a diagnosis of PVD in these circumstances, it is necessary to first treat the estrogen deficiency with local estrogen and repeat the Q-tip test to detect remaining allodynia despite remission of atrophy.

Pathophysiology

There is increasing evidence that PVD is associated with central sensitization of the pain circuits within the brain and spinal cord. Common comorbidities include irritable bowel syndrome, temporomandibular joint pain, interstitial cystitis, and a history of severe dysmenorrhea in younger years. When compared with control subjects, women with PVD have lower pain thresholds in nongenital sites[4] and their functional MRI results show greater activation of pain circuitry within the brain when a painful stimulus is applied to nongenital sites.[5]

Antecedent stress is typical for women with PVD.[6] A premorbid diagnosis of an anxiety disorder is 10 times more common in women with acquired PVD than in control subjects, and clinical depression is 3 times more common.[7] Women with PVD also have abnormal stress responses when compared to women without PVD, and the association between external stressors and the onset of symptoms in acquired PVD is well documented.[8]

Personality traits that can make individuals susceptible to stress occur more commonly in women with PVD than in control subjects. These include fear of negative evaluation by others, overconscientiousness, perfectionism, self-criticism, hypervigilance to physical sensations, harm avoidance, and a tendency to have numerous worrying thoughts even in the absence of a diagnosed anxiety disorder.[6] Stresses that contribute to the allostatic load and cause maladaptation of the stress response system can include internal personality-related stresses as well as environmental stresses.[9]

It is currently thought that stress can be responsible for changes in the modulation of top-down signalling from brain to spinal cord dorsal horn cells.[10] The brain regions known to exert this descending influence on nociception include the orbital prefrontal cortex, anterior insula, and amygdala. Central sensitization occurs when the brainstem periaqueductal gray and rostral ventromedial medulla integrate this top-down signalling to dorsal horn cells to upregulate pain sensitivity.[11]

Sadly, the outcome of living with pain leads to further, often severe, stress from feelings of sexual inadequacy and the inability to find a partner or to leave an unhealthy relationship, and to further deterioration of mood. Thus the stress that has contributed to the central sensitization only increases and maintains the chronicity of the pain.

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Predisposing factors

Anxiety and mood disorders and personality traits that make a woman susceptible to stress may well interact with genetic vulnerabilities.[12] There is evidence of genetic variants to some mediators of inflammation in keeping with histological findings from areas of allodynia where hyperproliferation of nociceptors and increased numbers of mast cells are present.

For a small subgroup of women with PVD, the onset of pain is associated with overgrowth of *Candida albicans*.[2] Typically, a severe yeast infection is treated but the symptoms never truly remit and ongoing burning pain results even though the usual discharge, pruritus, and objective evidence of Candida infection are absent.

There is also limited evidence that low-dose estrogen contraceptives, particularly those containing third-generation progestins, may precipitate PVD in predisposed women.[13]

Our clinical experience is that a menopausal onset of PVD follows a time of marked external stress in women with the personality traits mentioned above, suggesting these are predisposing factors.

Sexual sequelae

Frequently, motivation to be sexually active lessens with PVD. Even when partners are willing and enthusiastic to engage in nonpenetrative sex, such activity reminds the woman of what is not possible and motivation for any type of sexual activity fades. What could be considered adaptive behavior—that is, failing to notice sexual triggers and stimuli in the world around her to prevent a painful outcome—becomes maladaptive when the woman loses all sense of her own sexuality and is unable to imagine being sexually aroused again even if her pain were to be removed. Sexual partners also experience sexual and relationship sequelae.[14] Partners may feel rejected, fear they are no longer sexually attractive, and hesitate to instigate anything sexual. In turn, this hesitancy can be misunderstood and misinterpreted.

Need for timely diagnosis and therapy

To break the cycle of chronicity, stress needs to be addressed. The distress of living with an undiagnosed condition intensifies pain; receiving a diagnosis and learning that help is available can be therapeutic in itself. Women must be encouraged to take painful penetrative sex off the menu temporarily and begin some form of cognitive therapy.

Given that medical treatments have not proven to be superior to placebo, an interdisciplinary approach that focuses on cognitive therapy is needed. Functional brain imaging clarifies the importance of frontal-limbic regions in the cognitive control of pain. Thoughts underlie emotions and thoughts can be changed or reacted to differently.

There is evidence that psychoeducation in small groups along with either cognitive behavioral therapy (CBT)[15] or mindfulness-based cognitive therapy (MBCT)[16] is beneficial. With recent staffing increases, the BC Centre for Sexual Medicine at UBC is able to provide much-needed early therapy for more women. Participants attend eight weekly sessions of 2.25 hours each and complete home assignments to nurture their newly acquired cognitive skills.

Each of the two slightly different programs combines psychoeducation about chronic pain with some sexual therapy and requires learning either traditional CBT or MBCT. For the MBCT group, the home assignments include mindfulness practice. Preliminary results for this approach are encouraging, as are outcome studies of women with sexual dysfunction unassociated with pain.[17-18] There is also evidence that both CBT[19-21] and MBCT[19-22] can ameliorate anxiety and mood disorders, both common PVD comorbidities, and help with comorbid chronic pain conditions, thus providing benefit over and beyond treatment of dyspareunia.

In individual cases, medical adjuncts to cognitive therapy may also be considered. Sometimes a woman with a family history of PVD will volunteer that a relative with PVD has benefited from a tricyclic antidepressant and this can certainly be tried. As well, there is some clinical evidence that when the onset of PVD is associated with candidiasis and recurrence is suspected from the history or documented recurrences, then it can be helpful to apply an anti-inflammatory medication, namely 2% cromoglycate compounded in Glaxal Base, to the introital rim twice a day for 2 to 3 months. Some women who choose to experience penetration find they can lessen the pain by applying 5% lidocaine gel to the points of allodynia (and if this stings, then 5% lidocaine compounded in Glaxal Base can be applied). Women quickly learn that arousal itself can be analgesic.

Pelvic muscle physiotherapy and biofeedback can also be of benefit. If these provide enough desensitization, it may be possible to prescribe a series of vaginal inserts of increasing diam-

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eter to help overcome some of a woman's expectation of unbearable pain.

Referral

The BC Centre for Sexual Medicine is able to provide a full diagnostic assessment, including assessment of both partners when relevant, and can offer treatment to women with a diagnosis of PVD in the form of CIHR-funded small-group MBCT and CBT psychoeducational programs with follow-up over 12 months.

Referral forms can be obtained by contacting the centre:
BC Centre for Sexual Medicine/
UBC Sexual Medicine Program
UBC Hospital, Purdy Pavilion,
M41-2221 Wesbrook Mall,
Vancouver, BC V6T 1Z9
Website: http://psychiatry.ubc.ca/programs/sexual-med (click on Assessment to download a referral form)
Phone: 604 822-3690 (call to arrange faxing of a referral form)
Fax: 604 822-3148

Competing interests
None declared.

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