Vulvodynia: integrating current knowledge into clinical practice

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Key content

• Vulvodynia is a chronic gynaecological condition that results in significant distress to women and management can be challenging to the clinician.
• The 2003 International Society for the Study of Vulvovaginal Disease (ISSVD) defines vulvodynia as vulval discomfort that is described as burning, stinging or irritation, in the absence of relevant visible findings or specific signs of a clinically identifiable neurological condition. The condition can be localised (vestibule) or generalised and the discomfort can be spontaneous or provoked by physical contact.
• The diagnosis of vulvodynia is one of exclusion after inflammatory, infectious, dermatological, neoplastic, neurological and psychosocial conditions have been ruled out.
• A multidisciplinary approach to tackle the different components of vulvodynia is required that includes a lead clinician with clinical psychologist, physiotherapist, psychosexual medicine clinician and pain management specialist.
• Owing to the heterogeneity in the aetiology of the condition, multimodal therapy is recommended in most cases.

Learning objectives

• To review the current classification and pathophysiology of vulvodynia.
• To review the clinical manifestation and diagnosis of a patient with generalised and localised vulvodynia.
• To critically appraise the currently available treatments options for vulvodynia.

Ethical issues

• Psychosexual dysfunction related to this disorder raises the sensitive issue of open communication with the individual or couple on varying degrees of sexual and psychological counselling.
• Ethical issues that are realised in determining the cause of vulvodynia include sexual orientation and history of sexual abuse.
• How does evidence-based medicine direct health professionals in the treatment of this condition?

Keywords: chronic vulvar pain / generalised vulvodynia (GVD) / localised vulvodynia (LVD) / vulvodynia

Introduction

Vulvodynia is a painful gynaecological disorder characterised by chronic vulval pain, physical disability, sexual dysfunction and affective distress. It is defined by the International Society for the Study of Vulvovaginal Disease (ISSVD) as ‘vulval discomfort that is described as burning, stinging or irritation, in the absence of relevant visible findings or a specific signs of clinically identifiable neurological condition’. The estimated lifetime and point prevalence rates of chronic vulvar pain are around 10–16% and 4–7%, respectively. The average age of occurrence of vulvodynia is approximately 30 years, although a high prevalence is observed in all decades of life until age 70. When similar lifetime prevalences are compared, Hispanic women are found to be more likely to experience chronic vulval pain (80%) compared with Caucasian and African women in the US. Despite the high prevalence it is still underestimated as it can potentially be dismissed as a psychological condition. This is largely attributed to insufficient knowledge in establishing a definitive diagnosis. This article aims to provide a comprehensive review of recent terminology, classification, methods of diagnosis and current evidence-based recommendations in the treatment strategies of vulvodynia.

Current terminology and classification of vulvodynia

The term ‘burning vulval syndrome’ was introduced in 1970. In 1987, Friedrich termed this condition ‘vulval vestibulitis
syndrome’ based on the triad of (i) severe pain on vestibular touch or attempted vaginal entry, (ii) tenderness to pressure localised within the vulvar vestibule and (iii) physical findings of vestibular erythema of various degrees. Further to this, two terminologies were introduced for idiopathic vulval pain. One was vestibulitis as described by Friedrich’s criteria and dysaesthetic vulvodynia that is generalised and spontaneous with no physical findings.5

The current 2003 International Society for the Study of Vulvovaginal Disease (ISSVD) classifies vulval pain into two diagnostic groups as shown in Box 1. The first group includes women with specific disorders causing vulval pain such as infectious, inflammatory, neoplastic or neurological conditions. The second group includes women with vulval pain with no aetiology and referred to as vulvodynia. Vulvodynia is further subdivided into two subtypes i.e (i) generalised and (ii) localised. Generalised vulvodynia (GVD) is present when the pain affects the entire vulva and localised vulvodynia (LVD) is when the pain involves the vestibule, clitoris or portion of the vulva (referred as vestibulodynia, clitorodynia, hemivulvodynia) effectively replacing the old terminology of vulvovestibulitis and dysaesthetic vulvodynia respectively. Both generalised and localised vulvodynia can be provoked or unprovoked.2

**Box 1. The 2003 International Society for the Study of Vulvovaginal Disease terminology and classification of vulvar pain**

<table>
<thead>
<tr>
<th>Vulvar pain related to a specific disorder</th>
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<tr>
<td>Infectious: candidiasis, herpes, trichomoniasis</td>
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<tr>
<td>Inflammatory: lichen planus, lichen sclerosus, atrophic vaginitis, immunobullous disorder</td>
<td></td>
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<tr>
<td>Neoplastic: Paget’s disease, squamous cell carcinoma</td>
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<tr>
<td>Neurologic: herpes neuralgia, spinal nerve compression</td>
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**Clinical features**

The most common subtype is localised vulvodynia (LVD), which is considered primary when the onset of pain is present from the first introital touch that is related to tampon use or sexual intercourse and secondary in which a pain free period is followed by gradual or abrupt onset of pain.2 Provoked localised vulvodynia (LVD) is the leading cause of dyspareunia among women aged less than 50 years.6 The cardinal symptom is presence of pain upon vaginal penetration or with other focal vulvar pressure.6 Due to the chronicity of the condition, there is a high incidence of associated psychological distress, anxiety and sexual dysfunction.7 Generalised vulvodynia (GVD) is less common compared to localised provoked vulvodynia (6–7% versus 16%) and presents as diffuse, constant vulval pain, with the presence of burning or a feeling of rawness anywhere on the vulva from the mons pubis to the anus with the average age at onset of 40 years. There may be a symptom free period and the dyspareunia may not be an active complaint among them.6 However, evidence from studies demonstrates overlapping of characteristics of pain and location among the two subtypes of vulvodynia, thereby questioning their validity.8

**Pathophysiology of vulvodynia**

**Neuropathic pain hypothesis: peripheral and central nervous system sensitisation**

The aetiology of vulvodynia remains elusive. Various theories are proposed suggesting a multifactorial origin. However, the current commonly accepted mechanism for localised vulvodynia (LVD) includes an underlying inflammatory process or abnormal neural activity of the peripheral or central nervous system referred to as neuropathic pain hypothesis.7 Though a history of recurrent vulvovaginal candidiasis is reported by women with vulvodynia, its role as a causative agent is uncertain due to inaccuracy in the self-diagnosis of the infection and there is insufficient evidence for specific bacterial, viral or fungal infections implicated in the aetiology.7 Ramirez et al.10 demonstrated that the rate of colonisation by candida in these women is not higher than the control group and sensitisation probably occurs due to contact allergens with the fungus.

Regarding human papillomavirus (HPV) infection, several studies have failed to confirm an association with a positive HPV–PCR and therefore no causal relation is established.11 Despite this, it is often observed that vulvodynia symptoms appear after severe infections that can be fungal or bacterial in origin, urinary tract infection, postoperative infection or local injury. This pathogen related concept is supported by the molecular mimicry theory in which the pathogens activate T cells that attack self-antigens creating a microorganism induced immunopathologic state.12 The resulting inflammation sensitises the peripheral nervous system by activating mast cells that release proinflammatory cytokines, heparinase and nerve growth factor all of which then lead to proliferation of nociceptors and increased density of C-afferent nociceptors in the vestibular mucosa. This hyperinnervation predisposes to vestibular hyperaesthesia (perception of pain that is out of
proportion to the stimulus such as light touch) and allodynia (pain that is perceived different from that applied such as burning sensation on light touch) distinctive of localised provoked vulvodynia.13

Furthermore, this inflammatory pathway has been suggested to have a genetic predisposition as proinflammatory genetic variants of interleukin-1 receptor antagonist (IL1RN) and melanocortin-1 receptor (MC1R) genes are increased in women with vulvodynia.14 As inflammation explains the nociceptive symptoms, Pukall et al.15 found evidence that there is also systemic (non-localised) hypersensitivity to tactile and pain stimuli in these women due to inherent morphological alterations in the supraspinal pain modulatory circuit suggesting a central neuropathic process also contributing to the symptoms.

The National Institute of Health sponsored conference on vulvodynia in 2003 concluded that generalised unprovoked vulvodynia (GVD) is a combined neuropathic pain due to pudendal neuralgia and complex regional pain syndrome (CRPS) similar to other CRPS conditions such as interstitial cystitis and fibromyalgia.16 There is central nervous system sensitisation in these conditions that results in enhanced perception of systemic pain. It is observed that women with generalised vulvodynia may also be associated with other CRPS conditions such as interstitial cystitis and endometriosis due to up-regulated neurons in the dorsal horn of spinal cord releasing tachykinins (substance P) leading to a state of neurological ‘wind up’ that is manifested as visceral allodynia and hyperalgesia in the bladder and adjacent pelvic organs.17,18 Thus generalised vulvodynia is regarded as one example of CRPS.

Psychosexual dysfunction
The association of primary psychological dysfunction in the aetiology of vulvodynia is debatable. Bornstein J et al.19 suggested that somatisation symptoms might be a result rather than a cause of vulvar vestibulitis. Alternatively a somatoform hypothesis suggests that pre-existing psychosexual dysfunction may predispose to vulval pain and is therefore psychosomatic in nature.7 Whichever may be the primary initiating factor, studies have confirmed profound psychosexual ramifications such as anxiety, depression and disruption of interpersonal relationships prevalent among women with vulvodynia.6

Pelvic floor muscle dysfunction (PFMD)
There is evidence to suggest that hypertonicity of pelvic floor musculature contributes to localised provoked vulvodynia. Evidence from studies supports the view that reducing the tension of the pelvic floor muscles using electromyographic (EMG) feedback or a physical therapy rehabilitation programme resulted in diminished pain, less PFM tone, improved vaginal flexibility, and PFM relaxation.20

Other causes
Other theories include an early embryological defect in the primitive urogenital sinus. The hypothesis that this condition is related to increased urinary oxalates is currently refuted. There are reports that oral contraceptive pills predispose to fragile and sensitive vestibular mucosa with a decreased pain threshold to mechanical stimuli.21–23 The risk was higher in contraceptive pills with high progestogenic, high androgenic, and low estrogenic potency.24 However a recent population-based longitudinal study in Michigan, USA that studied the temporal association of oral contraceptive use and subsequent symptoms of vulvodynia concluded that there was no association between vulvodynia and previous oral contraceptive use.25

Evaluation of vulvodynia
History
The diagnosis of vulvodynia is based on clinical grounds made after excluding vulvovaginal infections, inflammatory disorders and vulval dermatoses. Evaluation of medical, surgical, and previous treatments together with sexual history will assist in identifying the specific conditions that cause vulval pain. Visual analogue pain scales and pain diaries assess the degree of pain. A checklist of relevant questions regarding pain and the risk factors for the symptoms and their impact on the patient is summarised in Box 2.6,26

Box 2. Checklist for pain history in women with vulvodynia

| Onset: | Spontaneous or provoked. Presence of triggering events such as coitus, tampon insertion, cycling, long periods of sitting at work, gynaecological examination or insertion of gynaecological instruments, infection episodes such as recurrent candidiasis. |
| Description of pain: | Burning, sharp stinging nature of pain. Any associated pruritis, generalised or localised? What improves the pain, intensity of pain and impact of pain on patients’ quality of life? |
| Associated symptoms: | Any skin lesions (mass, ulcer, colour change on the vulva) that is suggestive of vulval dermatosis or vulval intraepithelial neoplasia, symptoms of overlapping pain syndromes such as interstitial cystitis, low back pain, irritable bowel syndrome or fibromyalgia. |
| Past medical conditions: | Herpes simplex or herpes zoster, pelvic or vulvovaginal surgeries, hip or spine surgeries, pudendal nerve injury. |
| Co-morbid conditions: | Irritable bowel syndrome, fibromyalgia, chronic low back pain, interstitial cystitis or anxiety, depression or stress |
| Treatment history: | Duration of therapy, dosage, side-effects, compliance and reason for discontinuation if any. |
| Psychosexual history: | Dyspareunia – mild (dyspareunia present most of the time, does not prevent sexual intercourse), moderate (dyspareunia always present, intercourse possible at times), severe (dyspareunia prohibits intercourse), past and current sexual experiences, history of vaginismus and any history of sexual abuse. |
Physical assessment
Pelvic examination and localisation of the symptoms and signs to the area of the vestibule differentiates localised vulvodynia (LVD) from other causes of vulval pain.

Vulval inspection for erythema, fissures, excoriations, ulceration, hypopigmentation or architectural changes in the vulva is valuable in excluding vulvovaginal infection and vulval dermatosis. The diagnostic criteria for localised provoked vulvodynia is based on Friedreich’s criteria as described earlier.

Steps in clinical examination (Figure 1)
- Vulvar erythema on visual inspection at the vestibule may be a significant finding in localised vulvodynia but can be nonspecific as it can be observed in normal women.27 The vulva on examination in generalised vulvodynia (GVD) is usually normal.
- A moistened cotton swab test (Q tip test) is applied with gentle pressure to the inner thigh, labia majora, interlabial sulcus, clitoris, and perineum and at 2, 4, 6, 8 and 10 o’clock positions along the vestibule. This pressure elicits discomfort in women with vulvodynia especially at the posterior introitus and hymenal remnants.28 The presence of allodynia and hyperaesthesia throughout the vestibule suggest intrinsic pathology due to neuronal proliferation in the vestibule and if perceived in the posterior vestibule is suggestive of hypertonicity of levator ani muscles.
- The bulbocavernous reflex (elicited by gently stroking the labia majora) and the anal wink tests are done to rule out peripheral neuropathy.6
- Vaginal examination should be done with minimal application of pressure on any painful area with the insertion of a narrow speculum to examine the vaginal wall (epithelium) for signs of atrophy, erosions or synechiae that are suggestive of erosive lichen planus.
- A digital examination is performed with one finger for internal palpation of the pelvic floor musculature and to identify vaginismus and tenderness of pelvic floor musculature. The uterus and adnexa are palpated for evidence of pelvic masses or endometriosis.18

Investigations

Infection screening
Infection screening involves wet smears, vaginal pH, and fungal and bacterial cultures to exclude vulvovaginal infections, such as bacterial vaginosis, trichomoniastis and candidiasis, as a cause of vulval pain. A Norwegian study demonstrated bacterial vaginosis as a significant risk factor for localised vulvodynia and recommends wet smears as routine patient evaluation.29

Colposcopy
Colposcopy excludes subclinical human papillomavirus and localised fungal infection. However, a recent review clarifies that colposcopy and acetic acid adds little or nothing to the naked eye examination of the vulva.30

HPV testing
There is paucity of evidence for suggesting HPV in the aetiology of vulvodynia and hence testing for HPV infection is not indicated.9

Vulval biopsy
The practice of routine vulval biopsy is not supported. A study in Danish women with vulvodynia reported that in the presence of vulval erythema, only 12.5% demonstrated histopathological signs of vulval dermatosis therefore questioning the value of routine vulval biopsy in these women. Vulval biopsy is indicated if there are signs suggestive of vulvar dermatoses, intraepithelial neoplasia or in refractory vulvodynia.31

MRI study
There is no routine indication for MRI in unprovoked pain as sacral cysts as a cause of referred pain to the vulva is very rare.32 The checklist for evaluation in women with vulval pain is summarised in Box 3.
Vulval care

The initial management includes emphasis on gentle vulval care measures to minimise vulval irritation. A recent study on the effectiveness of vulval care demonstrated a statistically significant improvement in dyspareunia, burning, itching and pain. The vulval care measures that are recommended include:38,34

- avoiding the direct application of perfumes, dyes, chemicals, soaps on the vulva or on clothes that touch the vulva
- avoiding tight and synthetic wear (preference for 100% cotton)
- using adequate lubrication before intercourse in cases where dyspareunia is present
- use of a sitz bath and application of preservative free emollient such as petroleum jelly that seals the moisture in the skin and improves the barrier function
- application of cold gel packs to the vulval area.

Medical treatment

Medical therapies include topical, intralesional and oral drugs. Based on recent systematic reviews on the pharmacotherapy of vulvodynia, the following recommendations are summarised.

Topical therapy

There is evidence in support of the use of 2% or 5% lidocaine ointment, which improves symptoms following overnight application as well as prior to intercourse with a reduction in dyspareunia by 50%.35 Danielsson et al.36 further confirmed that both topical lidocaine and electromyographybiofeedback improve symptoms from the baseline without any significant difference between them. The authors concluded that a combination of these two treatments may prove more efficacious. Topical 2–6% gabapentin was evaluated in a retrospective study that indicated a 50% reduction in pain with improved sexual relationships. However topical agents should be prescribed with caution to avoid the problem of allergic contact dermatitis. Topical medications with no significant proven benefits include nifedipine, capsaicin, amitriptyline, baclofen, nitroglycerine and sodium cromoglycate.37

Intralesional therapy

The results from the first randomised controlled trial on botulinum toxin type A injection in the vestibular epithelium versus placebo demonstrated beneficial effect on pain reduction, sexual function and quality of life. However, the long-term effects are unclear.38 There are reports of successful treatment of refractory vulvodynia with submucosal infiltration with betamethasone and lidocaine.39

Management

The approach to management of women with vulvodynia includes educating the patient regarding her condition, vulval care measures, psychological support, and pharmacological and surgical therapy. It is good to take a multidisciplinary team approach, with the lead clinician triaging patients depending on their individual needs to other health professionals such as a clinical psychologist, physiotherapist, psychosexual medicine and pain management teams.26

Patient education

The patient should be informed about the natural history of vulvodynia and realistic information about its treatment. Counselling should include acknowledging her pain as real and that no single treatment is effective. She may therefore require a combination of therapy and improvement in the symptoms may take weeks to months. An individualised patient-centred approach is envisaged taking into account the wishes of the patient, her partner, local healthcare protocols and the costs. Information on support groups and patient information such as The Vulval Pain Society (http://www.vulvalpainsociety.org/) and The British Pain Society (http://www.britishpainsociety.org/patient_publications) should be offered.26 Educational seminars led by gynaecologists with expertise in the management of vulvodynia in a group format has been found to have a significant positive effect on psychological and sexual function in these women.33

The natural history of any disease refers to an uninterrupted progression of a disease in an individual from the moment of exposure to causal agents until recovery or death. Knowledge of the natural history of disease is important in disease prevention and control. As in vulvodynia, one of the prevention strategies is vulval care measures, and control of the disease by medical therapy. We used the term natural history in educating women.

Box 3. Checklist for physical evaluation and investigations in vulvodynia

- Vulval inspection for abnormal redness, fissures, erosion, ulceration and hypopigmentation.
- Cotton swab test for determining the area of tenderness and to assess the severity of pain.
- Sensory neurological examination for hyperaesthesia, allodynia and stroking for bulbocavernous reflex and anal wink to rule out peripheral neuropathy.
- Vaginal examination with minimal application of pressure and narrow speculum.
- Internal palpation of pelvic floor muscle for vaginismus or tenderness.
- Microscopic evaluation of wet smears, vaginal pH, fungal cultures and gram stain to exclude vaginitis.
- Testing for varicella zoster virus and herpes simplex in the presence of ulcers or vesicular eruptions.
- Dermatopathologist analysed vulval biopsy in the presence of signs of vulval dermatoses, neoplasia and refractory vulvodynia.
Systemic therapy
Tricyclic antidepressants (TCAs) such as amitriptyline, imipramine, nortriptyline and desipramine, selective serotonin reuptake inhibitors (SSRIs) and serotonin and noradrenalin reuptake inhibitors (SNRIs) are the commonly used medications at doses lower than that for depression in particular for unprovoked pain.

Amitriptyline is well studied and is prescribed at the dose of 5 mg to 25 mg nightly and can be increased by 10 to 25 mg weekly until adequate pain control (or a maximum dose of 150 mg daily) is achieved. It needs to be emphasised that it takes 4 or more weeks before full pain response is evident.40

A prospective nonrandomised study demonstrated that women prescribed with tricyclic antidepressants had 47% reduction in pain scores.41 A recent systematic review of the utility of antidepressants in vulvodynia, raised the concern that there is a need for additional well controlled trials to identify the characteristics that would predict women who would benefit from antidepressants.42

Anticonvulsants such as gabapentin and pregabalin may be used if there is intolerance or no response to TCAs.43 In a recent critical review on the utility of anticonvulsants in vulvodynia, raised the concern that there is a need for well designed randomised controlled trials to investigate the effectiveness of anticonvulsants in vulvodynia. Gabapentin is started at the dose of 300 mg orally for 3 days and gradually increased to reach a maximum total dose of 3600 mg.40 The common problems of these systemic medications are the side effects (such as sedation, dry mouth, dizziness with tricyclic antidepressants and cognitive impairment with anticonvulsants) that affect compliance with therapy. It is essential to discuss that titrating the dose to adequate levels for symptom control is essential as few randomised controlled trials are available and development of side effects may be a limiting factor in continued use of that particular medication. Multimodal therapy may often be required to achieve adequate pain control and it is essential to be cautious and to check for potential drug interactions. In the reproductive age group there is need for adequate contraceptive counselling before prescribing these drugs.45

In a recent randomised controlled trial evaluating the effect of enoxaparin, a low-molecular-weight heparin with antiheparinase properties was used in the treatment of localised provoked vulvodynia; enoxaparin reduced vestibular sensitivity and dyspareunia with a decrease in the intraepithelial free nerve fibres as evidenced by vulval biopsy.46

In summary, topical therapy with 2–5% lidocaine is effective and can be prescribed in provoked localised vulvodynia. Tricyclic antidepressants, gabapentin or pregabalin are appropriate options in unprovoked vulvodynia. However, the optimal drug therapy is still unclear due to the absence of well controlled trials.

Surgical treatment
Modified vestibulectomy
The surgical technique that is currently practised, modified vestibulectomy, is considered in women with localised provoked vulvodynia after exhausting the other treatment options.26 This procedure involves excising a ‘U’-shaped vestibular mucosa to Hart’s line (the edges of the vulvar vestibule) and advancing out the posterior vaginal mucosa to cover the defect (Figure 2). Modified vestibulectomy is associated with high levels of patient satisfaction and low complication rates.47 Interestingly a critical review of various treatment strategies in provoked localised vulvodynia, favour vestibulectomy as the most efficacious treatment to date. However, there is a need for more robust data to support this.48,49

Laser ablation of the vulvar epithelium with the KTP-Nd:YAG laser or the CO2 laser has been advocated as an alternative to invasive vestibulectomy. The laser disrupts angiogenesis and increases nerve density and promotes collagen remodelling without disrupting the macroscopic anatomy. The outcome of laser therapy for vulvodynia was comparable to vestibulectomy. A recent report on KTP-Nd:YAG laser use for vulvodynia with a 2-year follow-up found that 68% of the patients reported less pain with sexual intercourse and improved sexual satisfaction.50

Figure 2. Modified vestibulectomy illustrating a ‘U’-shaped excision of the vestibular mucosa and advancement of vaginal mucosa.
In summary, although there is success with surgical treatment, it is not exempt from postoperative complications such as decreased vaginal lubrication and worsening of pain.

In the absence of more robust data to support this, surgical treatment is best reserved for refractory cases of provoked localised vulvodynia. Surgery is not recommended for generalised vulvodynia as it does not alter the complex chronic pain that accompanies the condition.

**Psychological and psychosexual therapy**

It is evident that chronic vulval pain affects psychosexual health with exacerbation of symptoms of depression, anxiety, somatisation and sexual function. Psychosocial therapy such as cognitive behavioural therapy (CBT) is behaviour oriented and assists in establishing a personal control of pain by self-management skills that alters the woman’s thoughts and behaviour on pain, emotional and sexual function. Psychosexual counselling offers basic sexual function assessment and provides education, information and support groups for individuals or couples. A comprehensive treatment approach therefore includes combined psychological and sexual therapy addressing the issues of both psychological and somatic symptoms. Multiple sessions with a clinical psychologist help to teach the patient to cope with pain management strategies such as the pain gate theory, addresses the patient’s expectations of treatment and offers sexual rehabilitation. The patient is preferably counselled in the presence of her partner in improving physical non coital sexual contact, overcoming pelvic floor muscle hypertrophy with sensate focus therapy.

Desensitisation of the vulva for allodynia with psychosexual and physical therapy is recommended as first-line techniques by the British Society for the Study of Vulval diseases. The physical therapies include pelvic floor muscle biofeedback, vaginal trainers, self-massage of the vulva and vaginal TENS (transcutaneous electrical nerve stimulation) that help to overcome the phobia of genital touch by reducing the hypertonicity of the levator ani muscles.

Pelvic floor physical therapy is effective in women with evidence of pelvic floor muscle hypertonicity. It is most useful in women with vaginismus, back pain and spasm of muscles. This therapy includes internal and external therapeutic exercises, pelvic floor retraining and biofeedback that reduces the introital tenderness and resumption of sexual intercourse. Gentilcore-Saulnier et al evaluated pelvic floor muscles with surface electromyography (sEMG) and achieved improved vaginal flexibility and increased capacity of relaxation of pelvic floor muscles. In an open trial by a Swedish research group, women with localised vulvodynia benefitted from a multidisciplinary treatment model that includes desensitisation of vaginal mucosa, pelvic floor rehabilitation and psychosexual therapy.

In summary, there is growing evidence supporting the effectiveness of psychological therapy complemented with pelvic floor physical therapy in reducing pain and improving sexual function with no documented adverse effects.

**Alternative therapies**

Combined physical therapy with biofeedback and transcutaneous electrical nerve stimulation (TENS) with intravaginal probe in vulval pain demonstrated considerable improvement in vulval pain and dyspareunia. There are encouraging reports of success with neuromodulation treatment such as transcranial direct current stimulation and spinal cord simulators in refractory vulvodynia. There are reports of beneficial effects of acupuncture in vulvodynia by switching off the overactive pain fibres. Two prospective studies demonstrated short-term pain relief with significant improvement in quality of life at the end of 5- and 10-week treatments in unprovoked vulvodynia. A recent qualitative study in provoked vulvodynia, resulted in improvement in perceived sexual health, decreased pain scores, and improved mental wellbeing in the majority of participants following acupuncture therapy. However, the small sample size in all these studies indicates that evaluation with acupuncture is still preliminary and more information is required by replicating the results in randomised trials before recommendations can be made. The overview of the treatment strategies are summarised in Box 4.

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**Box 4. Overview of vulvodynia management**

- A multidisciplinary approach to tackle the different components of vulvodynia including lead clinician with clinical psychologist, physiotherapy, psychosexual medicine and pain management teams.
- Women are given adequate explanation of their diagnosis, written information, support groups and contact information.
- Multimodal therapy should be part of the treatment strategy owing to the heterogeneity in the aetiology of the condition.
- The aim of therapy is to optimise pain control, enhance psychological and physical wellbeing and improve quality of life.
- The end points in the treatment include reducing the triggers of irritation, blocking peripheral nociceptors, central inhibition, tackling pelvic floor dysfunction and addressing psychosexual dysfunction.
- The first level of treatment for all subsets of vulvodynia is to minimise vulval irritation by vulval care measures.
- Topical local anaesthetics are choice for women with provoked vulvodynia that facilitates penetrative sex.
- Tricyclic antidepressants such as amitriptyline or nortriptyline are the initial management choice in unprovoked vulvodynia. In the event of intolerance, the anticonvulsants such as gabapentin may be initiated.
- Modified vestibulectomy is an option for refractory localised provoked vulvodynia.
- Pelvic floor hypertonicity addressed with pelvic floor exercises and techniques to desensitise the pelvic floor muscles.
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Conclusion

Vulvodynia is a chronic painful and distressing gynaecological condition associated with physical disability and psychosexual dysfunction. The aetiology is multifactorial and diagnosis is primarily based on exclusion of conditions that cause vulval pain. Health professionals caring for such patients should work in synergy to offer multidisciplinary and multimodal approaches, treating the biological symptoms and addressing the psychosocial and sexual dimensions of the condition. Future priority research should aim to assess the characteristics of the patients who would benefit with individualised and multimodal treatment plans.

Disclosure of interests

The authors report no conflicts of interest.

Author contributions statement

The authors have equally contributed in the preparation of the manuscript.

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