International Journal of Women's Dermatology 7 (2021) 454–457

Contents lists available at ScienceDirect

International Journal of Women's Dermatology

Review

Dermatographism with vulvar symptoms

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ARTICLE INFO

Article history:
Received 15 December 2020
Revised 24 April 2021
Accepted 26 April 2021

Keywords:
Antihistamine
dermatographism
scratch test
vulvar pain
vulvar pruritus
women's health

ABSTRACT

Dermatographism (DG) is characterized by a localized, inducible, wheal-and-flare response along the distribution of mechanical pressure. We report an illustrative case of DG with vulvar symptoms (DG-VS) and review the literature on this rarely recognized but easily treated etiology of vulvar complaints. A 35-year-old woman presented with a 1-year history of vulvar pruritus unresponsive to antifungal, antibacterial, and steroid treatments. A prior punch biopsy was nondiagnostic. Vulvar examination revealed normal architecture and no cutaneous abnormalities. She was markedly dermatographic with a scratch test. DG-VS was diagnosed. The patient achieved complete symptomatic control on low-dose hydroxyzine. She maintains excellent control at 3.5 years. In the literature, a typical patient with DG-VS is of reproductive age, with several years' history of vulvar symptoms (itching, burning, pain, or swelling) and repeated empiric treatment for infectious/inflammatory etiologies. Exacerbation with sexual activity, menstruation, or wearing tight clothing is characteristic and supports the role of mechanical pressure in inducing focal symptoms. Dermatologic changes to the vulvar skin are rarely noted. DG-VS is diagnosed based on clinical findings, symptom patterns, and a positive scratch test and is treated with antihistamines. DG-VS remains absent from current vulvar disease guidelines. In the complex world of vulvar pain and itch, an etiology so easily screened for and readily treated warrants consideration.

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Introduction

Dermatographism (DG) is a physical urticaria characterized by a localized, inducible, wheal-and-flare response along the distribution of mechanical pressure, resulting in the phenomenon of "skin-writing" (from the Greek *derma* [skin], *graphē* [to draw or write]; Maurer et al., 2018; Nobles et al., 2020). Although DG is well recognized, genital complaints are rare (Nobles et al., 2020). We report a case of DG with vulvar symptoms (DG-VS) and review the literature addressing this rarely recognized but easily treated condition.

Case report

A 35-year-old woman presented with a 1-year history of vulvar pruritus. Five previous clinicians repeatedly treated her for vulvovaginal candidiasis, bacterial vaginosis, and *Ureaplasma* infection without relief. Clobetasol ointment was also ineffective. A prior

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https://doi.org/10.1016/j.ijwd.2021.04.008

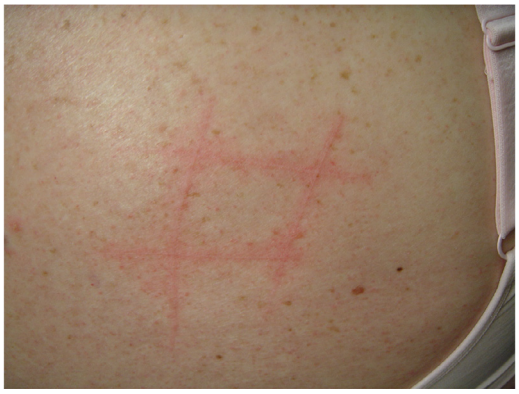

Fig. 1. Representative image of erythema and wheal formation (positive scratch test) in a tic-tac-toe board pattern.

biopsy demonstrated mild telangiectasias and attenuation of collagen (possibly representing steroid atrophy) without evidence of inflammation or atypia. Periodic acid–Schiff stain testing was negative.

Upon presentation to author G.W.M., the patient reported waxing and waning itch that distracted her from daily tasks, kept her up at night, and was "absolutely horrendous" about 2 days out of every 2 weeks. The patient was not sexually active. Vulvar exposures included laundry detergent, unscented bar soap, and lotion limited to the mons. On visual inspection, follicular papules were noted on the mons. Vulvar architecture was normal without atrophy, erythema, lichenification, or other dermatologic changes. The patient demonstrated a marked wheal-and-flare response on the back with a scratch test (Fig. 1).

The patient was diagnosed with folliculitis on the mons and DG-VS. She was advised to discontinue local personal care products and was prescribed oral hydroxyzine 10 to 20 mg nightly, with an additional 10 to 20 mg every 6 hours as needed. At 1-month follow-up, the patient reported complete symptomatic relief. At 3.5 years, she is no longer dermatographic on scratch test and experiences recurrence only when holding hydroxyzine.

Discussion

DG has a prevalence of 2% to 5% in the general population (Kirby et al., 1971; Wong et al., 1984). Pressure-induced wheals are characteristically a cutaneous phenomenon. Mucosal involvement is recognized but has not been rigorously studied (Binmadi and Almazrooa, 2016; Golberg et al., 2014; Lambiris and Greaves, 1997; O'Hare and Sherertz, 2000; Perniciaro et al., 1993; Sherertz and Thiers, 1994; Wong et al., 1984). The prevalence of DG with genital symptoms is unknown. Patients with DG may not recognize or report these symptoms, and clinicians are unlikely to ask about them (Lambiris and Greaves, 1997).

There are few publications regarding DG-VS. The literature is limited to letters and brief reports. Table 1 summarizes the three English-language case reports of DG-VS (Lambiris and Greaves, 1997; Perniciaro et al., 1993; Sherertz and Thiers, 1994). Two series are summarized in Table 2 (Golberg et al., 2014; O'Hare and Sherertz, 2000). An abstract described three more cases (Goldman, 2000), and there are two French-language reports (Lübbe et al., 2000; Mathelier-Fusade et al., 2007).

The typical patient is of reproductive age with several years' history of vulvar symptoms and has undergone empiric antimicrobial, antifungal, and topical steroid treatment. Although infectious workup is often warranted, repeated workup may delay appropriate care, increase morbidity, create undue financial burden, and be a significant source of distress and frustration.

DG-VS presents with itching, burning, pain, or swelling. Exacerbation with sexual activity, menstruation, or wearing tight clothing is characteristic and supports the role of mechanical pressure in generating focal symptoms. Some level of vulvar swelling with sexual arousal is physiologic and normal, but pain or pruritus indicate a pathologic process, such as infection, allergy (Golberg et al., 2014; Mathelier-Fusade et al., 2007), inflammatory dermatoses, pudendal neuropathy (Ghizzani et al., 2019), or DG-VS.

DG presents with wheal formation at sites of mechanical pressure (e.g., purse straps, clothing). However, patients with DG-VS may not be aware of or may not associate typical DG symptoms with genital complaints. Although our patient was dermatographic, neither she nor her five prior clinicians had associated DG with her vulvar pruritus.

Dermatologic changes to the vulvar skin are rarely appreciated. Erythema is nonspecific. Edema may be observed or induced with manipulation (Sherertz and Thiers, 1994). Vaginal discharge and architectural changes are not associated. Lack of lichenification speaks against a strong itch–scratch cycle component, although nighttime rubbing may induce or exacerbate pruritus or burning.

As of 2016, the consensus-approved screening test for DG is scratch testing: stroking the skin of the back with a firm, nonpointed object in a linear pattern and observing for wheal formation within 2 to 10 minutes (Magerl et al., 2016). In the context of vulvar complaints, patients should be screened for a history of urticaria or DG and assessed via scratch testing (Lambiris and Greaves, 1997; Mathelier-Fusade et al., 2007). This quick and simple point-of-care procedure provides a great opportunity to explain the suspected clinical picture to the patient. Scratch testing of the vulva is not warranted. A positive scratch test and characteristic vulvar symptoms that resolve with treatment of DG is confirmatory of DG-VS (Goldman, 2000; Mathelier-Fusade et al., 2007; O'Hare and Sherertz, 2000).

As of 2018, the guidelines on chronic inducible urticarias recommend a second-generation H1 antihistamine as first-line treatment for symptomatic DG (Magerl et al., 2016; Zuberbier et al., 2018). First-generation H1 antihistamines may be used when nighttime itch is distressing (Patel and Yosipovitch, 2010). Hydroxyzine, a first-generation H1 antihistamine, has demonstrated efficacy in several studies of DG (Kulthanan et al., 2020). In DG-VS, first- or second-generation antihistamines have been used as monotherapy (Lübbe et al., 2000; Mathelier-Fusade et al., 2007; Sherertz and Thiers, 1994). Lübbe et al. (2000) noted that 11 of 14 patients experienced symptomatic relief, and five relapsed with treatment cessation. Reported adjuvants include tricyclic antidepressants (doxepin, amitriptyline), topical agents (adrenaline, halcinonide), and lubricant for intercourse (Goldman, 2000; Lambiris and Greaves, 1997; Mathelier-Fusade et al., 2007; O'Hare and Sherertz, 2000; Perniciaro et al., 1993). Overall, antihistamine treatment with or without adjuvants leads to excellent symptom resolution.

Based on our clinical experience and review of the literature, we recommend hydroxyzine 10 to 40 mg nightly with 10 to 20 mg every 6 hours as needed. A known side effect of hydroxyzine is drowsiness, making this therapy particularly helpful for patients who experience sleep disturbance due to itching, as in the case of our patient. In our experience, nighttime dosing has been extremely well tolerated. First-generation antihistamines are not recommended for long-term use in older patients.

For this patient, cessation of personal care product use and initiation of hydroxyzine led to symptomatic relief. She found that symptom control was contingent on continuing hydroxyzine. Encouraging cessation of genital personal care products is standard of care in patients with genital complaints, but this measure alone does not lead to symptomatic resolution in patients with DG-VS.

Table 1
Case reports of DG with vulvar symptoms

Authors	Patient	Clinical history	Previous treatment	Physical examination	Additional workup	Treatments
Perniciaro et al., 1993	38-year-old woman	3 years of constant burning and irritation of introitus with dyspareunia and dysmenorrhea; pruritus absent	• Topical antifungal • Topical steroid • Oral steroid	• No apparent vulvar abnormality • Vulvar discomfort elicited with manual examination • Positive DG test on back, elicited with removal of patch tests	• KOH negative • Vulvovaginal culture negative • Vulvar biopsy unrevealing • Patch testing (elicited DG)	Terfenadine 60 mg 2 × per day + cyproheptadine 4 mg 3 × per day
Sherertz and Thiers, 1994	28-year-old woman	Intermittent vulvar pruritus and burning of unspecified duration exacerbated by exercise, intercourse, and menses	• Topical antifungal	• No apparent vulvar abnormality • Inducible erythema and edema with manipulation of labia • Absent for DG on back	• Not described	Astemizole 10 mg every night at bedtime for 3 months with no recurrence at 1 year
Lambiris and Greaves, 1997	25-year-old woman	8 years of chronic generalized urticaria, with "several years" of persistent burning, swelling, and pruritus of the introitus, exacerbated by menses and intercourse	• Systemic antifungal • Topical antifungal • Also treated sexual partner	• No apparent vulvar abnormality • Positive DG test on back (confirmed by dermographometer)	• Vaginal smear, *Candida* culture, and aceto-whitening negative • Challenge tests for cold, heat, cholinergic, and delayed-pressure urticaria negative	Cetirizine 10 mg orally every day, with 2% topical adrenaline cream as needed

DG, dermatographism

Table 2
Case series of DG with vulvar symptoms

Authors	Design	Participants	Patient characteristics	Suggested workup	Suggested management
O'Hare and Sherertz, 2000	Observational study	16 patients (26.7%) with vulvodynia at one genital dermatology clinic found to have DG	• Mean age: 43.9 years (range, 18–78 years)[a] • Multiyear history of vulvar burn/itch failing multiple topical therapies • Symptom exacerbation with intercourse and menses • Medical history of atopy, recurrent candidiasis, and/or DG	• Scratch test	• Antihistamines • Tricyclic antidepressants (doxepin, amitriptyline)
Golberg et al., 2014	Case series	6 patients presenting for suspected latex allergy with vulvovaginal symptoms presumably associated with condom use, found to have DG	• Mean age: 25.3 years (range, 22–37 years) • Burning, swelling, and itch of the vulva • Negative allergy testing • Worked in health care field	• Scratch test • Latex allergy testing	• None described

DG, dermatographism
[a] Characteristics of entire study group; not specific to the 16 patients with DG.

Conclusions and future directions

DG-VS is an identifiable and treatable cause of vulvar symptoms. Still, the literature on vulvar health scarcely includes DG-VS in the differential diagnosis (Byth, 1998; Gopal et al., 2016; Sand and Thomsen, 2018). Notably, DG-VS is not included in dermatologic, gynecologic, and sexual health guidelines or reviews of vulvar pain (Bornstein et al., 2019, 2016; Committee on Practice Bulletins - Gynecology, 2020; Lynch et al., 2012; Mauskar et al., 2020). Lack of inclusion creates a challenge for dermatologists, gynecologists, and others who care for patients with vulvar complaints and inevitably delays treatment, diagnosis, and research.

In seeking a diagnosis, our patient faced numerous failed treatments, unnecessary and repeated diagnostic tests, and persistent, worsening itch. In the complex world of vulvar pain and itch, an etiology so easily screened for and treated warrants consideration. Inclusion of DG in practice guidelines, continuing medical education, and care recommendations from key vulvar disease resources is a vital step to educate health care providers and stimulate further research.

Declaration of Competing Interest

None.

Funding

None.

Study approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

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