

Chronic vulvar irritation: could toilet paper be the culprit?

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It is estimated that half of all women older than 24 years of age will experience at least 1 episode of vulvovaginitis discomfort; however, some say that this number is an underestimate.¹⁻³ Although vulvar discomfort or pain encompasses a number of conditions, vulvovaginitis is perhaps the most common cause.⁴ Vulvovaginitis can result from bacterial, viral, or yeast infections,⁵⁻⁸ or from contact irritation or allergy.⁹ Douches, feminine hygiene sprays, cleansers, and medications used on the vulva and in the vagina can all cause contact vulvitis.⁹ Vulvovaginitis is characterized by vaginal discomfort and might present with abnormal vaginal discharge, pruritis, dyspareunia, or dysuria; the vulva is often swollen and erythematous.^{5,6,10-12} Vulvar skin is more readily irritated than skin elsewhere.¹³ Often, low-grade erythema of the vulva is not readily apparent because of the pigmentation of the skin of the vulva.

Symptoms of vulvovaginitis, such as itching, burning, and stinging, can be debilitating. Physical activities such as running or cycling can be difficult. Women might avoid sexual intercourse because of dyspareunia and some might find it difficult to use tampons during their menstrual cycle. Almost half of vulvar problems in women presenting to family physicians have no clear cause.^{14,15} When accurately diagnosed, however, vulvovaginitis can be treated effectively with topical or oral azoles, antibiotics, and boric acid propolis.^{2,4,6,12}

When women present to physicians, yeast vaginitis is often diagnosed solely based on self-diagnosis or the patient's history—even though an accurate diagnosis requires clinical assessment, a positive fungal culture result, and a vaginal pH assessment.^{10,16} For many women, any vulvovaginitis-type symptoms have become synonymous with yeast infections. Readily available over-the-counter (OTC) antifungal medications help lead to this conclusion. Studies have shown that 50% of women who use OTC antifungal medications do not have yeast infections.¹⁷ Since the introduction of OTC antifungal medications in the early 1990s, their use has increased substantially.¹⁸ In the United States, it is estimated that women spend \$250 million annually on OTC antifungal medications.¹⁹ As a result of self-diagnosis and self-treatment, the prevalence and incidence rates of vulvovaginitis might be grossly underestimated.^{10,20}

Case description*

A 51-year-old white female office worker complained of a 4-year history of vulvar “rawness,” itchiness, and mild dyspareunia. She did not have symptoms of unusual or malodorous vaginal discharge, and she did not experience any perianal symptoms. She was a nonsmoker with a history of hypertension, which was treated with ramipril and metoprolol. She had no drug allergies and no previous history of either atopic or contact dermatitis.

Vulvovaginal symptoms initially occurred every 3 or 4 months. Given the easy accessibility of OTC antifungal medications, the patient self-treated with clotrimazole vaginal ovules and topical cream. She experienced relief of her symptoms for a few months after each treatment; however, her symptom-free intervals gradually shortened until her symptoms became difficult to control with OTC antifungal medications. She noted some symptom relief from a barrier cream. She did not use other OTC products.

The effects of these symptoms on the patient's life was substantial. Frequent purchases of OTC medication became costly. When her symptoms were at their worst, she experienced difficulty walking and became anxious about traveling anywhere outside her home town. Before a trip abroad, she sought medical opinion at a local walk-in clinic where she was given a prescription for oral fluconazole. The vaginal and cervical cultures taken at that time were negative.

Two days after her visit to the walk-in clinic, the patient traveled to her home country in Europe; while there, she experienced complete relief of her symptoms, which she attributed to the fluconazole. Immediately upon her return to Canada her symptoms recurred. After 1 week, owing to illness of a family member, she returned to her home country. Again, in her home country the patient experienced complete remission of her symptoms. Upon return to Canada, her symptoms returned. This set of events led the patient to begin a search for an external irritant and to a discovery of the culprit: bleached toilet paper. Although unbleached toilet paper is commonly used in her home country, most of the toilet paper in Canada is bleached. Now the patient only uses cheap

*The physicians who prepared this case study were not the patient's regular primary care providers; however, they completed an extensive chart review, and no clinical examination notes were present.

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toilet paper that is “bleached without chlorine,” and she has remained symptom-free.

Subsequent extensive allergy testing using the North American Standard Screening Series, as well as moist toilet paper and diluted chlorine bleach, revealed that the patient has mild allergies to formaldehyde, lanolin, and benzocaine, but not to chlorine.

Discussion

This case report raises some important issues related to vulvar irritation. Many women suffer from vulvovaginitis symptoms and seek relief with OTC antifungal medications, yet diagnostic testing is negative for fungal conditions. In the case of our patient, we suspect that antifungal creams provided a barrier between the skin and the bleached toilet paper, hence the apparent initial relief of symptoms.

We suspect that she did not experience perianal symptoms with the bleached toilet paper because toilet paper would generally be used less frequently perianally than in the vulvar area; also, as mentioned previously, vulvar skin is more easily irritated than skin elsewhere on the body. It is also possible that the topical antifungal medication used to treat the symptoms of vulvitis further aggravated the skin, as it is known that preservatives, fragrances, antibacterial agents, and alkali or acid agents in douches can all cause allergic contact dermatitis. Products used only on the hands, such as nail polish, can come into contact with vulvar skin and cause dermatitis as well. Our patient did not use nail products, creams, or other hand products that did not travel with her to Europe. Given that our patient revealed allergic reactions to formaldehyde, benzocaine, and lanolin, and that these substances are not present in the brands of barrier cream and antifungal medication that she used, they can be eliminated as causative agents in this instance.

Our patient suspected the toilet paper she was using in Canada was the causative agent of her chronic vulvitis. An extensive review of the literature was conducted using the PubMed database, which included a combination of the search terms *vulvar allergens*, *vaginitis*, *contact dermatitis*, *toilet paper allergies*, *over-the-counter medication*, *chlorine*, and *formaldehyde*. This search did not reveal any cases of toilet paper dermatitis but did reveal documented cases of contact dermatitis due to moist toilet paper, such as baby toilet wipes.^{21,22} Given our initial suspicion that chlorine bleach might have been the offending substance, our patient was tested with various dilutions of chlorine with negative findings. In hindsight, this step was unnecessary, as chlorine is a gas that quickly disperses and likely does not remain contained in the toilet paper.²³

We postulated that there must be a chemical that remains in the bleached toilet paper that acts as an irritant or allergen. We contacted several toilet paper

EDITOR'S KEY POINTS

- Vulvovaginitis occurs at least once in half of all women older than 24 years of age; it can result from bacterial, viral, or yeast infections, contact irritation, and allergy. Symptoms can include vaginal discomfort, itching, vaginal discharge, dyspareunia, or dysuria; the vulva is often swollen and erythematous.
- Most women with symptoms of vulvovaginitis self-medicate with over-the-counter antifungal medications; however, 50% of women who use these medications do not have yeast infections. As a result of this self-diagnosis and self-treatment, the prevalence and incidence of vulvovaginitis might be grossly underestimated.
- Patients who present with symptoms of chronic vulvovaginitis should be clinically assessed for the presence of infection; if laboratory results are negative, physicians should advise patients to use unbleached or minimally processed toilet paper to see if symptoms abate, and to check the chemical content of personal hygiene or household products for possible allergens or contact irritants.

POINTS DE REPÈRE DU RÉDACTEUR


- Les femmes de 24 ans et plus connaissent au moins un épisode de vulvovaginite dans leur vie; il peut s'agir d'une infection bactérienne, virale ou aux levures, d'une irritation de contact ou d'une allergie. Au nombre des symptômes, on peut mentionner un inconfort vaginal, des démangeaisons, des pertes vaginales, une dyspareunie ou une dysurie; la vulve est souvent enflée et érythémateuse.
- La plupart des femmes qui présentent des symptômes de vulvovaginite se traitent elles-mêmes avec des médicaments antifongiques en vente libre; par ailleurs, 50 % des femmes qui utilisent ces médicaments n'ont pas d'infection aux levures. En raison de cet autodiagnostic et de cet autotraitement, la prévalence et l'incidence des vulvovaginites pourraient être considérablement sous-estimées.
- Il faudrait évaluer cliniquement les patientes qui présentent des symptômes de vulvovaginite chronique pour détecter la présence d'une infection; si les résultats de laboratoire sont négatifs, les médecins devraient conseiller à leurs patientes d'utiliser du papier hygiénique non blanchi ou le moins traité possible pour voir si les symptômes disparaissent, et de vérifier le contenu en produits chimiques des produits d'hygiène personnelle ou domestiques pour détecter des allergènes ou des irritants de contact possibles.

manufacturers but were unable to obtain a list of the chemicals used to produce toilet paper. All manufacturers refused to provide consumer information, claiming proprietary rights to trade secrets. What we learned

from a subsequent literature review, however, is that facial tissues, paper towels, and other forms of paper contain formaldehyde. Formaldehyde and its reactive derivatives are used in the paper industry to improve the wet-strength and other “valued” characteristics of paper and paper products. For example, shiny, heavy, white examining-table paper is much more likely to contain formaldehyde than thinner, less expensive, duller, and more fragile types of paper.⁹ The same could be said for toilet paper; the thick, absorptive, strong, bleached, and expensive brands are more likely to contain formaldehyde than the thinner, cheap, “grayish” brands.

Toilet paper is a ubiquitous personal hygiene product, and it is assumed that it contains no harmful chemicals. However, formaldehyde not only causes irritation, but it is also listed as a cancer-causing agent.²⁴ There are more than 100 000 chemicals used in commercial products. Few have been tested for possible risks to health, yet those risks can be considerable.²⁵ As evidence of this claim, Health Canada recently banned D4 and D5 siloxanes from shampoo and conditioner.^{26,27}

Conclusion

As clinicians, we suggest that when a woman presents to her family physician with chronic vulvar problems, the usual standard of care be applied. However, if all test results are negative and no cause can be determined, the patient should be advised to use unbleached toilet paper or minimally processed toilet paper to see if her symptoms abate. This is an easy, low-cost, and non-invasive suggestion that might solve the patient’s problem. Further, as a result of this case study, we believe that it is crucial that the manufacturers of toilet paper and other personal hygiene products and household goods be required to reveal all ingredients and chemicals in their products. 

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Competing interests

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