

The Hazards of Moist Toilet Paper

Allergy to the Preservative Methylchloroisothiazolinone/Methylisothiazolinone

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Background: Methylchloroisothiazolinone/methylisothiazolinone (MCI/MI), a common preservative in some brands of moist toilet paper (baby wipes and moist towelettes), has been reported to be a cause of allergic contact dermatitis. However, few cases have been reported in the United States.

Observations: We report the cases of 4 adult patients with severe perianal and perineal allergic contact dermatitis seen at our institution during a 6-month period.

With patch testing, we identified allergy to MCI/MI, and we determined that all 4 patients were using moist toilet paper. The dermatitis resolved after use of the moist toilet paper was discontinued.

Conclusion: This study highlights that the MCI/MI in moist toilet paper can be a cause of perianal and perineal allergic contact dermatitis.

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THE USE OF MOIST TOILET PAPER (baby wipes and moist towelettes) to cleanse after defecation is a relatively recent regular practice among many adults. Methylchloroisothiazolinone/methylisothiazolinone (MCI/MI), a common preservative in cosmetic and industrial products, is a well-known allergen and is an ingredient in many brands of moist toilet paper. Perianal and perineal allergic contact dermatitis (ACD) due to MCI/MI-containing moist toilet paper has been reported from Europe, but few reports have come from the United States. Herein, we report the cases of 4 adults with severe perianal and perineal ACD from using moist toilet paper containing MCI/MI for their intimate personal hygiene who were seen in our Department of Dermatology between January and June 2009. We present these cases to raise awareness among health care providers of the possible hazards of MCI/MI-containing moist toilet paper.

REPORT OF CASES

CASE 1

A 49-year-old man who was a mail carrier sought medical care for a perianal and intragluteal eruption with associated pruritus and pain of 5 months' duration. He

judged the pain to be of the highest intensity, 10 on a scale of 1 to 10, and had not worked for the previous 2 months because walking was so painful. The eruption was recalcitrant to topical corticosteroids and had not responded to nystatin cream, trypsin complex ointment, or fluconazole. He had seen numerous physicians before coming to our dermatology department. Physical examination showed bright red confluent patches in the perianal area extending onto the right buttock, discrete and confluent papules on the left buttock with fissuring (**Figure 1**), and pink patches on the face and arms. Biopsy specimens of the perianal area showed subacute dermatitis, and patch testing to a standard series demonstrated a positive allergic patch test reaction to MCI/MI (**Table 1**). On close questioning after the patch testing, the patient disclosed that he had started to use Cottonelle (Kimberly-Clark Corporation, Neenah, Wisconsin) moist toilet paper before the onset of this skin eruption. Because Cottonelle moist toilet paper contains MCI/MI, the patient was advised to discontinue the use of the moist toilet paper and to avoid future use of products containing MCI/MI. Six months later, the patient reported an 85% to 90% improvement after switching to a different moist toilet paper that did not contain MCI/MI and using topical corticosteroid treatment.

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Figure 1. Case 1. Bright red confluent patches in the perianal area extending onto the right and left buttocks in a 49-year-old man who used moist toilet paper.

CASE 2

A 63-year-old woman sought care for severe pruritus and irritation of the genital and perianal areas of more than 1 year's duration. The patient had seen numerous physicians and was given a diagnosis of pityriasis rubra pilaris, for which she received methotrexate treatment, with subsequent development of hepatotoxic effects. Furthermore, she had tried topical and oral corticosteroids. Physical examination showed confluent erythematous patches bilaterally on the labia majora and mons pubis extending to the perianal area (**Figure 2**). Patch testing to a standard series demonstrated a positive allergic reaction to MCI/MI (Table 1). The patient disclosed that she regularly used Cottonelle moist toilet paper for intimate personal hygiene. Six weeks after beginning topical corticosteroid treatment and discontinuing use of the Cottonelle wipes, the patient reported a 95% improvement.

CASE 3

A 70-year-old man with a history of psoriasis came to our dermatology department with severe pruritus in the perianal area of 20 years' duration. The patient had seen numerous physicians in the past, and the perianal lesions

Table 1. Results of Patch Testing

Item Tested	Reaction Grading		Relevance of Allergic Reaction
	Day 3	Day 5	
Case 1			
MCI/MI, 100 ppm, aq	++	++	R
2-Bromo-2-nitropropane-1,3-diol, 0.5%	0	+++	Q
Hexahydro-1,35-tris(2-hydroxyethyl)triazine, 1%	++	++	Q
Case 2			
MCI/MI, 100 ppm, aq	++	+++	R
Ethyl acrylate, 0.1%	+	+	Q
Methyl methacrylate, 2%	+	++	Q
Sorbic acid, 2%	0	+	R
Case 3			
MCI/MI, 100 ppm, aq	++	+++	R
2-bromo-2-nitropropane-1,3-diol, 0.5%	0	++	Q
p-Phenylenediamine, 1%	++++	++++	P
Balsam of Peru, 25%	++	++	P
Fragrance mix, 8%	+++	+++	P
Benzoic acid, 5%	0	++	Q
Disperse orange No. 3, 1%	+++	++++	P
Benzocaine, 5%	+	++	Q
Fragrance mix II	0	+	P
Case 4			
MCI/MI, 100 ppm, aq	+	++	R
Gold sodium thiosulfate, 2%	0	+	N
Quaternium 15, 1%	0	+	R
Potassium dichromate, 0.25%	0	+	N
Cobalt chloride	0	+	N

Abbreviations: 0, negative; +, macular erythema; ++, weak nonvesicular erythema, infiltrated papules; +++, strong, edematous, or vesicular reaction; +++++, extreme, spreading, bulbous, ulcerative reaction; MCI/MI, methylchloroisothiazolinone/methylisothiazolinone; N, not relevant; P, allergic, formerly relevant; Q, allergic, questionably relevant; R, allergic, relevant.



Figure 2. Case 2. Erythematous patches bilaterally on the labia majora and the mons pubis in a 63-year-old woman who used moist toilet paper.

were thought to be involvement by psoriasis, but they were recalcitrant to treatments such as clobetasol propionate, Epsom salts, and zinc oxide. Physical examination revealed pronounced perianal erythema, some acanthosis, and a fissure of the perineum at approximately the 5-o'clock position (**Figure 3A**). The patient reported using Cottonelle moist wipes. Patch testing to a

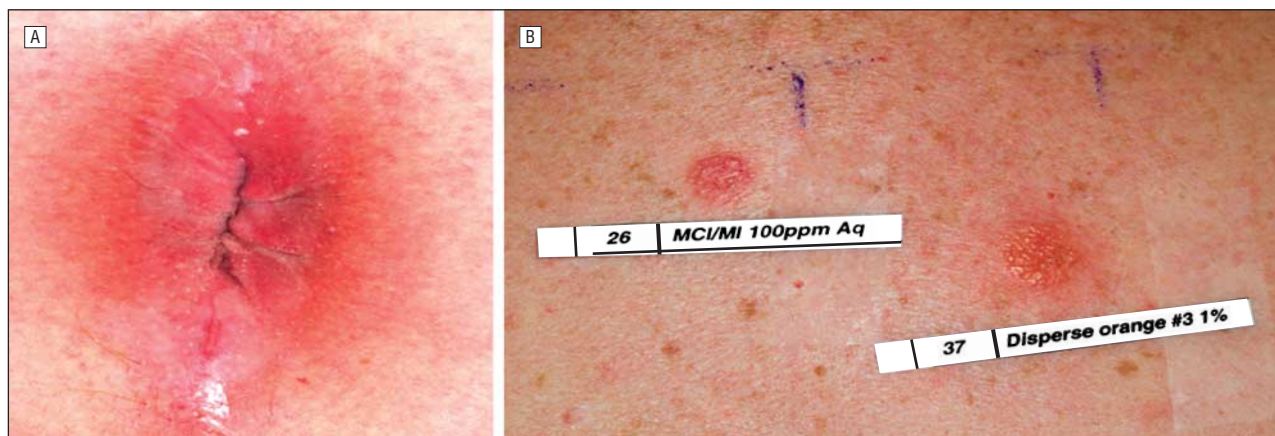


Figure 3. Case 3. A, Pronounced perianal erythema, some acanthosis, and a fissure of the perineum in a 70-year-old man who used moist toilet paper. B, Patch test result demonstrating a positive reaction to the allergen methylchloroisothiazolinone/methylisothiazolinone.



Figure 4. Case 4. Erythema and white papules in the perianal area of a 38-year-old woman using moist toilet paper.

standard series demonstrated a positive allergic reaction to MCI/MI (Figure 3B and Table 1). Two weeks after beginning triamcinolone treatment and discontinuing use of the Cottonelle wipes, the patient reported an 80% to 90% improvement. At 6 weeks, the patient reported a 99.9% improvement and was using a non-MCI/MI wipe at last follow-up.

CASE 4

A 38-year-old woman sought care for severe perineal and perianal dermatitis with fissures of 1 year's duration. The patient had seen numerous physicians and tried treatments including clobetasol, desonide, oral antibiotics, and antifungal agents. Physical examination revealed mild erythema and white papules in the perineal area (**Figure 4**). Patch testing to a gynecologic and standard series demonstrated a positive allergic patch test reaction to MCI/MI (Table 1). The patient reported using moist toilet paper of an unknown brand.

One month after beginning topical corticosteroid treatment and discontinuing use of the moist toilet paper, she reported significant improvement.

COMMENT

Methylchloroisothiazolinone/methylisothiazolinone (Kathon CG; Rohm and Haas, Philadelphia, Pennsylvania) is a widely used preservative in cosmetics and industrial products. Originally introduced to the United States in 1980, MCI/MI gained popularity because of its antimicrobial effects at very low concentrations and activity at a broad pH range.^{1,2} However, MCI/MI has been a well-documented cause of ACD, particularly in Europe, where restriction of its use as a preservative has been implemented because of increased sensitization.³ The North American Contact Dermatitis Group reported a prevalence of MCI/MI contact allergy of 2.8% in 2005 and 2006.⁴ A study at Mayo Clinic from 2001 to 2005 identified patients who underwent patch testing for suspected ACD. Of 3740 patients tested, 3.0% had a contact allergy to MCI/MI.⁵

Methylchloroisothiazolinone/methylisothiazolinone is a common preservative in moist toilet paper. Introduced primarily for baby hygiene, moist toilet paper now is also widely used by adults for their intimate personal hygiene. Perianal and perineal ACD due to MCI/MI-containing moist toilet paper has been rarely reported in the United States. **Table 2** summarizes reported cases of ACD caused by MCI/MI in moist toilet paper. The present case series describes 4 persons seen over a period of 6 months who had perianal and perineal dermatitis from MCI/MI-containing moist toilet paper. Patch testing for these patients was conducted to the standard series in a uniform fashion using the same methods as described previously,⁵ and all allergens were in water, petrolatum, or alcohol. All of the patients had a positive allergic patch test reaction to MCI/MI. Furthermore, each patient reported resolution of symptoms after discontinuing use of the moist toilet paper.

Our cases illustrate several important points. First, patients with perianal lesions often continue to use the

Table 2. Cases of ACD Caused by MCI/MI in Moist Toilet Paper Reported in the Literature

Source, Year	Patients, No. ^a	Description of Study	Patients With Positive MCI/MI Patch Test Results, No.	Resolution After Avoiding Moist Toilet Paper
Present study, 2010	4	Patients with h/o perineal/perianal dermatitis; h/o moist toilet paper use	4	Yes
Hogan, ⁶ 2009	1	Patient with h/o perianal and lower extremity dermatitis; h/o moist toilet paper use	1	Yes
Timmermans et al, ⁷ 2007	4	Patients with h/o dermatitis (2 of 4 involved perineum); h/o moist toilet paper use	4	Yes
Fields et al, ⁸ 2006	4	Patients with h/o dermatitis (1 of 4 involved perineum); h/o moist toilet paper use	1 patient with perineal involvement	Yes
Tosti et al, ⁹ 2003	95 ^b	Patients with h/o dermatitis involving hands, face, and trunk; 1 child with facial and diaper dermatitis had h/o MCI/MI wet wipe use	7, including child with facial and diaper dermatitis with known MCI/MI wet wipe use	NR
Guin et al, ¹⁰ 2001	9	Over a 10-y period, patients with hand eczema associated with exposure to baby wipes were studied for pattern and sensitivities	3	Yes
de Groot, ¹¹ 1997	4	Patients with h/o perianal dermatitis with secondary symmetrical vesicular dermatitis of the hands; h/o moist toilet paper use, suggesting tissues and/or ACD in perianal area caused the hand eruption	2	Yes
Guimaraens et al, ¹² 1996	1	Patient with h/o dermatitis involving hands only; h/o moist toilet paper use for baby's hygiene	1	Yes
de Groot et al, ¹³ 1991	5	Patients with h/o dermatitis of perineum; h/o moist toilet paper use	3	Yes
Minet et al, ¹⁴ 1989	1	Patient with h/o perianal dermatitis associated with fissuring for 7 y; h/o moist toilet paper use	1	Yes

Abbreviations: ACD, allergic contact dermatitis; h/o, history of; MCI/MI, methylchloroisothiazolinone/methylisothiazolinone; NR, not reported.

^aAll patients were adults unless otherwise noted.

^bAll patients were children (mean age, 7.7 y).

moist toilet paper with the belief that the cleansing will help heal the lesions; they may not make the correlation that the moist toilet paper is the culprit. For example, the patient in case 3 had perianal dermatitis for 20 years, which was initially thought to be part of his psoriasis. He never suspected the moist toilet paper as the cause of his condition. Within 6 weeks of withdrawing the causative brand of moist toilet paper, he reported a 99.9% improvement.

Second, misdiagnosis of this problem can result in unnecessary treatments and their concomitant potential adverse effects. The patient in case 2 likely had a misdiagnosis of pityriasis rubra pilaris, was started on methotrexate therapy, and had subsequent development of hepatotoxic effects.

Third, perianal ACD can be extremely uncomfortable and debilitating. The patient in case 1 missed 2 months of his work as a mail carrier because of the severity of his ACD. These examples demonstrate the importance of specifically asking patients with perineal or perianal dermatitis about moist toilet paper use and educating them about the potential for ACD.

It is also important to acknowledge that, although in our cases MCI/MI appeared to be the causative allergen, moist toilet paper may contain other documented ACD-causing ingredients such as quaternium 15, iodopropynyl butylcarbamate, DMDM hydantoin, and various fragrances.⁸ Therefore, it cannot be assumed that all ACD caused by moist toilet paper is due to MCI/MI. A list of ingredients in Cottonelle moist toilet paper is provided in the following tabulation.

Water
Sodium chloride
Propylene glycol
Sodium benzoate
Polysorbate 20
Sodium lauryl glucose carboxylate
Lauryl glucoside
Malic acid
Methylisothiazolinone
Aloe barbadensis leaf juice
Tocopheryl acetate
Fragrance

This study has some limitations. For example, neither patch testing nor use tests were performed on our patients with the suspect brands of moist toilet paper. A use test involves applying the suspected product to a small area of skin to see if it elicits a reaction. Performing these tests would have allowed us to more definitively link the ACD to the moist toilet paper. In addition, because all of our patients were prescribed topical corticosteroids for treatment, it is difficult to quantify to what extent the patients' improvements were indeed from discontinuation of the moist toilet paper. However, before being seen at our clinic, all of our patients had tried topical corticosteroids to relieve their symptoms. Although they reported some relief with these earlier treatments, the relief they reported after they stopped using the moist toilet paper was far greater.

In conclusion, perianal and perineal ACD caused by moist toilet paper containing MCI/MI is probably more

prevalent in the United States than once thought. The growing popularity of moist wipe use among adults increases the risk of exposure and potential sensitization, especially on mucosal surfaces. Along with others, we voice our concerns about MCI/MI being used as a preservative in cosmetics, industrial products, and moist toilet paper. Perianal and perineal dermatitis caused by moist toilet paper may be unrecognized and/or misdiagnosed, causing chronic discomfort and disability for many patients. Dermatologists and other health care providers must be made aware of the hazards of MCI/MI-containing moist toilet paper, and they must then educate their patients regarding alternatives and stress the importance of label reading.

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