

“But Doc... I can’t leave the house without putting on my makeup!!!” Implications of a significant cosmetic allergy

George H. Luciuk*, Lisa Discepola*, Simon Pimstone**, and Kevin W. Stapleton*

* Kokua Pharma, Inc. Richmond, BC, CANADA, ** Department of Medicine, University of British Columbia, Vancouver, BC, CANADA

Background

Some women report experiencing adverse **reactions to cosmetics** following application.

Interestingly, some individuals within this group also indicate that treatment for severe allergic reactions with injected **epinephrine provides minimal or no relief**.

These characteristics may be attributable to a **sensitivity to metabisulfite**.

Reactions to sulfites are becoming more **recognized in the Dermatology literature**, where it was awarded “Allergen of the Year 2024”.¹

Sulfiting Agents

Sulfiting agents are **widely used in multiple industries** including food, beverages, pharmaceuticals, cosmetics and in various occupational settings.¹

Cosmetic industry has seen a **rise in the use of sulfiting agents**. From 2003 to 2020.²

- Use of sodium sulfite **increased 188%**
- Use of metabisulfite **increased 263%**

FDA classifies sulfiting agents as “Generally Recognized as Safe (**GRAS**)” when used in accordance with Good Manufacturing Practices (GMP).³

Exposure to sulfites has been associated with a **wide range of clinical effects**, including Type 1 allergic reactions and anaphylaxis.³⁻⁹

Most **screening patch test series do not include sulfites**, thus identification of these occult allergens may be missed.¹

Prevalence of sulfite sensitivity may be **under-recognized and under-reported**.¹

Methods

Twenty-four female patients from one private allergy practice who had reported skin reactions after cosmetic application were tested between 15 July 2024 and 8 Dec 2025.

Patients underwent skin prick testing with serial dilutions of **epinephrine injection** (1 mg/mL epinephrine, 1 mg/mL metabisulfite).

- Dilution range: 1:1,000,000 to 1:1,000

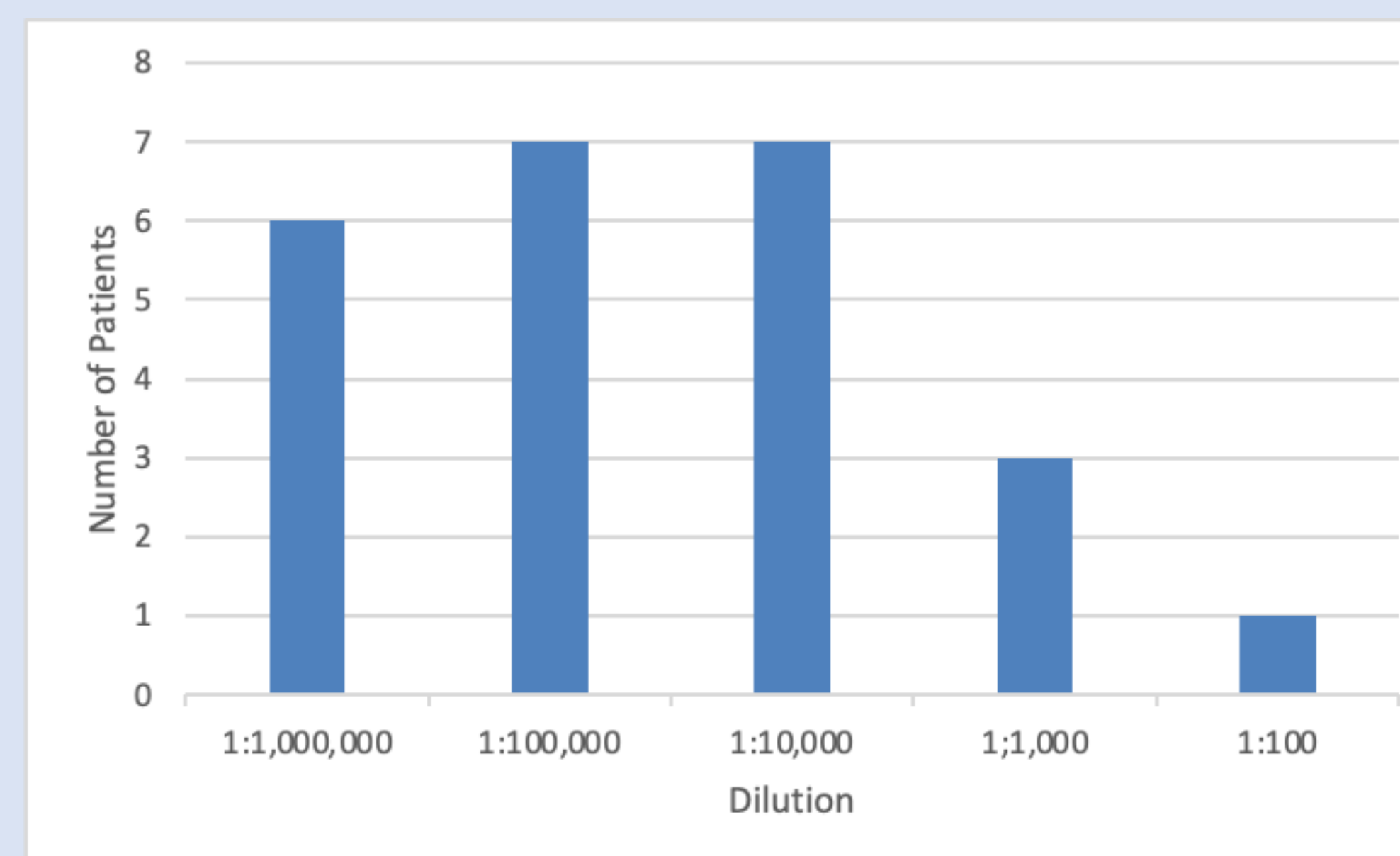
References

1. Ekstein SF, Warshaw EM. Sulfites: Allergen of the Year 2024. *Dermatitis*. 2024;35(1):6-12.
2. Johnson W, Bergfeld WF, Belisito D V, et al. Sulfites. *Int J Toxicol*. 2023;42(3_suppl):1105-1145.
3. Riggs BS, Harchelroad FP, Poole C. Allergic reaction to sulfiting agents. *Ann Emerg Med*. 1986;15(1):77-79.
4. Vally H, Misso N L. Adverse Reactions to the Sulfite Additives. Vol 5; 2012. <http://www.allergy.org.au/content/view/full/128/1>
5. Frick WE, Lemanske RF. Oral sulfite sensitivity and provocative challenge in a 2-year-old. *J Asthma*. 1993;28(3):221-224.
6. Yang WH. Purchase ECR. Adverse reactions to sulfites. *CMAJ*. 1985;133(9):865-867. Accessed December 26, 2024.
7. Bosso J V, Robertson DM, Lirticaria, Angioedema, and Anaphylaxis Provoked by Food Additives. *Food Allergy: Adverse Reactions to Foods and Food Additives: Fifth Edition*.
8. Twarog FJ. Metabisulfite Sensitivity in Asthma: A Review. 1983;4(2).
9. Premer RM, Stevens JJ. Anaphylaxis after ingestion of sodium bisulfite. *Ann Allergy*. 1976;37(3):180-182.
10. Cox LS, Sanchez-Borges M, Lockey RF. World Allergy Organization Systemic Allergic Reaction Grading System: Is a Modification Needed? *Journal of Allergy and Clinical Immunology: In Practice*. 2017;5(1):58-62.e5.
11. Roth J V, Shields A. A dilemma: How does one treat anaphylaxis in the sulfite allergic patient since epinephrine contains sodium metabisulfite? *Anesth Analg*. 2004;98(5):1499.
12. Luciuk GH. Adrenaline Anaphylaxis. *Journal of Allergy and Clinical Immunology*. 1993;91(1, Part 2):153.

Results

All patients exhibited moderate to severe systemic allergic responses classified as Grade 2 to Grade 5 according to the WAO scale¹⁰, indicating sensitivity to metabisulfite.

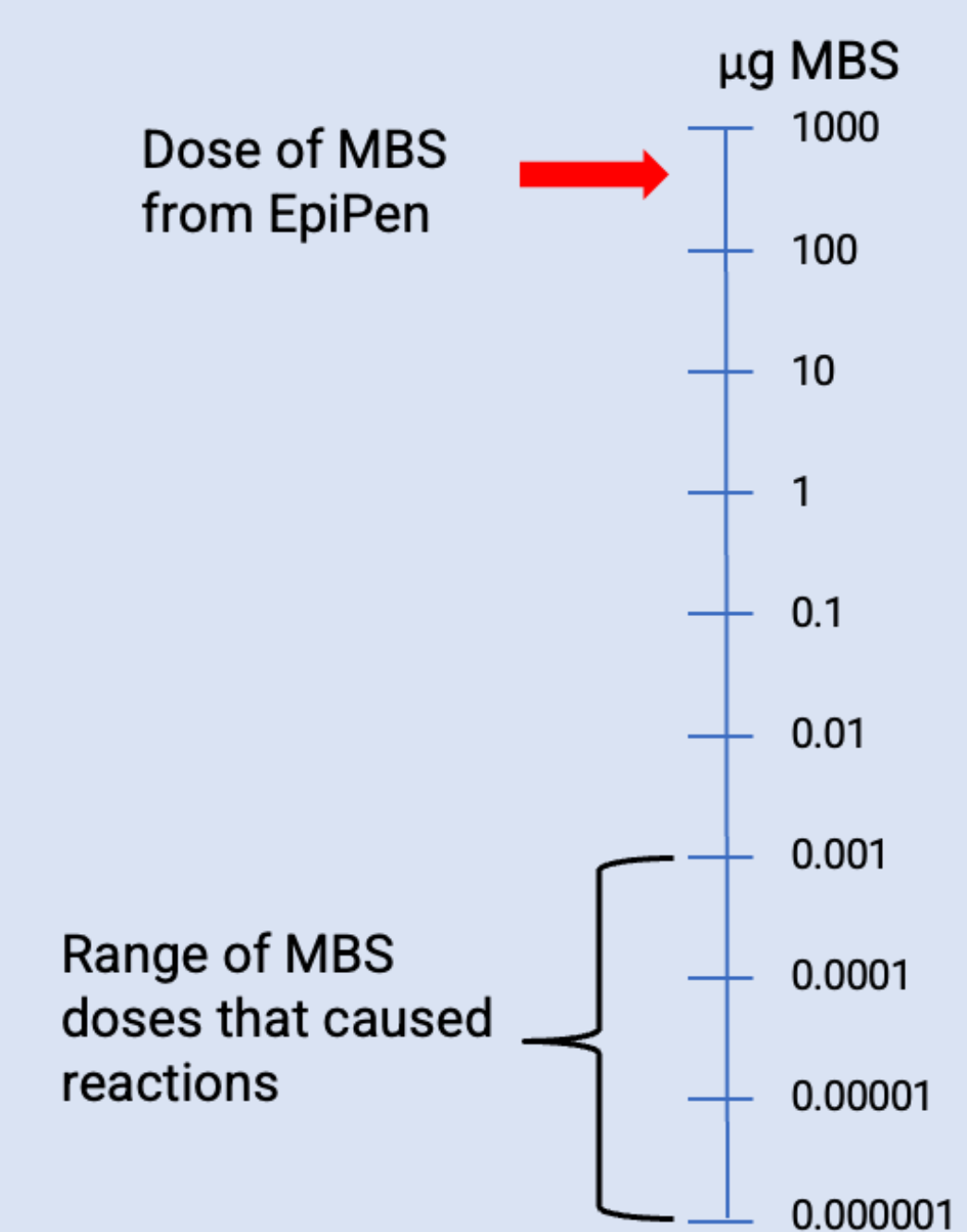
Figure 1: Number of patients having systemic allergic reactions at each dilution



Dose of metabisulfite delivered in the skin prick tests was 0.9 pg to 0.9 ng, depending on the dilution.

In comparison, an 0.3 mg dose of epinephrine from an EpiPen or IM injection contains 500 µg metabisulfite.

Figure 2: Range of MBS doses causing systemic allergic reactions in a skin prick test compared to an 0.3 mg dose of IM epinephrine



Options for treating allergic reactions in metabisulfite sensitive patients

Patients who are sensitive to sulfites and experience allergic reactions face limited treatment options, as **sulfites are used as preservatives in all injectable epinephrine formulations**.

Case studies indicate that **reactions to sulfite preservatives in medications** can occur sporadically and vary in severity from mild to life-threatening.⁸

In some instances, administering an EAI to patients sensitive to metabisulfite has resulted in **worsened symptoms**.^{11,12}

For instance, one case study reported a patient receiving four doses of subcutaneous epinephrine (containing metabisulfite as a preservative) over two days without resolution of symptoms.³

Identifying sulfite sensitive patients

Since most screening test series do not include metabisulfite, it is up to the physician to detect.

Common elements for patients in the study include:

- Sensitivity to **mascara or cosmetics**
- Dislike of **dried fruits**, or sensitivity to eating them
- Sensitivity or dislike of **beers, wines**, crustaceans, medications, sauerkraut, vinegars, or fruit flavored gummy candy such as gummy bears or jujubes
- Sensitivity to **leather shoes**, especially new shoes with no hosiery
- **Spearmint or peppermint flavorings**, ASA, NSAIDs, toothpastes (need to use Sensodyne)
- Sensitivity to medications with red-, yellow- or orange-colored **dyes**

Conclusions

Allergy to metabisulfite may have a **higher prevalence** than currently recognized.

Guidance on identification of a relatively common diagnosis.

- Factors to help the physician identify potential reactors was presented

Accurate diagnosis is important, as it influences **prevention and treatment strategies** as well as **patient outcomes**.

Patients susceptible to metabisulfite may experience **non-responsive or paradoxical exacerbation** with treatment using epinephrine formulations containing metabisulfite.

Metabisulfite free treatment options should be investigated