

A Topical Cream Containing a Zinc Gel (Allergy Guard) as a Prophylactic against Latex Glove-Related Contact Dermatitis

To the Editor:

We have several concerns regarding the recently published study by Shanta Modak and colleagues in the March 2005 issue.¹ The article misleads dermatologists by broadly suggesting that a barrier cream will work for dermatitis related to latex glove use. As a result, this barrier cream is likely to be used inappropriately in an attempt to reduce reactions that are symptomatic of a type I natural rubber latex (NRL) protein hypersensitivity or a type IV chemical hypersensitivity.

First and foremost, there is an egregious misrepresentation of reactions to NRL throughout the paper. In the abstract, the authors state, "Many health care workers are sensitized to the proteins in natural rubber latex and get contact dermatitis as a result of wearing latex gloves." This erroneously implies that a protein-based contact dermatitis accounts for the majority of latex-glove reactions. While this may support the aim of the study, it is not correct. It also ignores the complexity of reactions to NRL products, which can include type I reactions to NRL proteins and type IV reactions to processing chemicals as well as proteins.

Technically, the protein data reported are suspect. The authors used a nonstandard method of protein determination (ultraviolet absorption) that is susceptible to interference. Not surprisingly, the levels of glove protein reported are at least an order of magnitude greater than those typically reported in the literature.²⁻⁴ Accepted (albeit imperfect) methods include Lowry protein assays, immunologic assays, high-performance liquid chromatography, and atomic absorption spectroscopy, but none of these were used in the current study.²⁻⁴

The more common form of rubber-based allergic contact dermatitis is due to processing chemicals such as thiurams, carbamates, and mercaptobenzothiazoles. While there is some evidence of a protein-based allergic contact dermatitis from NRL, its prevalence is far less than the 7 to 10% observed for thiurams and carbamates.⁵⁻⁸ The authors also failed to note that the same processing chemicals are found in synthetic rubbers (nitrile and neoprene) and in consumer rubber, personal care, and agricultural products.

The article trivialized rubber-based allergic contact dermatitis by declaring it "not a serious condition since it resolves when a person stops wearing the gloves." Unfortunately, health care workers cannot simply avoid wearing gloves, and alternatives can be limited. Moreover, because

the same chemical allergens can be found in consumer products, exposure occurs outside of work and without the use of gloves. Finally, the broken skin barrier from contact dermatitis has been linked to the transmission of pathogens, including hepatitis C and human immunodeficiency virus.⁹

Even if Allergy Guard (VSP Technologies, Inc., Ossining, NY) functions as proposed, it would only be appropriate for use by individuals with a protein-based contact dermatitis from NRL uncomplicated by either allergic contact dermatitis to rubber processing chemicals or type I NRL protein hypersensitivity. The authors failed to make this important clinical distinction. They also neglected to note that there have been few individuals with this diagnosis. To date, less than 1% of tested individuals have had a positive patch-test reaction to NRL, and of these, many have also exhibited symptoms of type I NRL protein hypersensitivity.⁸ For those health care workers with a definitive and diagnosed protein-based allergic contact dermatitis from NRL, isn't wearing synthetic rubber gloves a simpler and safer solution?

Curtis P. Hamann, MD

Chief Executive Officer and Medical Director

Pamela A. Rodgers, PhD

Research Scientist

SmartPractice

Phoenix, AZ

References

1. Modak S, Gaonkar TA, Shintre M, et al. A topical cream containing a zinc gel (Allergy Guard) as a prophylactic against latex glove-related contact dermatitis. *Dermatitis* 2005;16:22-7.
2. Koch HU. Regulatory aspects of latex allergy (CEN; extractable protein and allergen assays for latex gloves). *Rev Fr Allergol* 1997; 37:1201-10.
3. Palosuo T, Alenius H, Turjanmaa K. Quantitation of latex allergens. *Methods* 2002;27:52-8.
4. Tomazic-Jezic VJ, Lucas AD. Protein and allergen assays for natural rubber latex products. *J Allergy Clin Immunol* 2002;110:S40-6.
5. Schnuch A, Uter W, Geier J, et al. Contact allergies in healthcare workers. Results from the IVDK. *Acta Derm Venereol* 1998;78: 358-63.
6. Nettis E, Colanardi MC, Soccio AL, et al. Occupational irritant and allergic contact dermatitis among healthcare workers. *Contact Dermatitis* 2002;46:101-7.
7. Nettis E, Assennato G, Ferrannini A, Tursi A. Type I allergy to natural rubber latex and type IV allergy to rubber chemicals in health care workers with glove-related skin symptoms. *Clin Exp Allergy* 2002;32:441-7.

8. Sommer S, Wilkinson SM, Beck MH, et al. Type IV hypersensitivity reactions to natural rubber latex: results of a multicentre study. *Br J Dermatol* 2002;146:114-7.

9. Beltrami EM, Kozak A, Williams IT, et al. Transmission of HIV and hepatitis C virus from a nursing home patient to a health care worker. *Am J Infect Control* 2003;31:168-75.

Response

To the Editor:

The following is our response to the comments and concerns of the authors of the letter regarding our study.

Allergy Guard (VSP Technologies, Inc., Ossining, NY) is not just a barrier cream although its barrier capabilities are significantly better than those of other protective creams we tested (see the results in Table 3 of our article). Furthermore, Allergy Guard containing zinc showed a significant reduction in sodium lauryl sulfate-induced skin irritation in volunteers. Zinc salts have been shown to have anti-inflammatory and antiirritant properties and have been reported to inhibit the release of specialized T lymphocytes expressed in allergic reactions.¹⁻⁴ The zinc salts in Allergy Guard appear to bind the proteins and other chemicals present in natural rubber latex (NRL) gloves, and this presumably leads to lower skin reactions.

The results shown in Table 2 of the article show reduced concentration of protein in Allergy Guard-treated gloves when tested by the ultraviolet (UV) absorption method. We agree with the authors that this method may not give absolute protein levels. The protein extract may have some UV-absorbing contaminants such as mercaptobenzothiazoles from the glove. However, the lower concentration of UV-absorbing materials in the Allergy Guard-treated gloves indicate that the zinc salts in Allergy Guard may interact and precipitate the proteins and other chemicals in the latex glove.

Regarding specific criticisms in the letter, we have the following comments.

Our study does not suggest that the use of Allergy Guard can reduce symptomatic reactions of a type I NRL protein hypersensitivity. In fact, we did caution that Allergy Guard is not indicated for use as a prophylactic agent against immediate type I hypersensitivity (see "Conclusions" in our article).

We do not agree with the authors that there is misrepresentation of reactions to NRL throughout the paper. We do recognize the complexity of reactions to NRL products. In the introduction and discussion sections of

our paper, we referred to other published reports that suggest that type IV reactions are mainly due to chemicals used in the manufacturing of gloves, in addition to the components in raw latex.⁵⁻⁹

In response to the comment that we have trivialized glove-related contact dermatitis, we would like to reiterate the complete statement in the introduction of our article, which is as follows: "Type IV hypersensitivity is not usually a serious condition since it resolves when the person stops wearing the gloves. However, there have been reports of anaphylactic reactions to latex in persons who previously had experienced only contact dermatitis."⁸ The importance of preventing type IV contact dermatitis is again stated in the second paragraph of the introduction.

The volunteers selected in this study were health care workers who exhibited delayed type IV reactions after the use of latex gloves, due to the presence of processing chemicals or proteins. These volunteers were using vinyl gloves in spite of the disadvantages of using these gloves. The problems of using vinyl gloves are inflexibility and permeability to fluids and infectious organisms.^{10,11} One study reported that 63% of vinyl gloves (as against 7% of latex gloves) leaked after users repeatedly attached and removed syringe needles.¹² Vinyl gloves also contain chemicals that can cause contact dermatitis.¹³ Some health care workers who used latex gloves on a regular basis at least once a day exhibited contact dermatitis and continued to use gloves but remained symptomatic.^{14,15}

Allergy Guard is recommended for use as a prophylactic cream for individuals who exhibit mild contact dermatitis after wearing latex gloves but do not wish to use alternative glove materials or by health care workers to delay the initial onset of contact dermatitis from repeated exposure to latex glove irritants and allergens.

Shanta Modak
Trupti A. Gaonkar
Milind Shintre
Lester Sampath
Lauser Caraos
Ingrid Geraldo

College of Physicians and Surgeons
of Columbia University
New York, NY