
Correspondence

ARE SAFETY NEEDLES SAFER THAN TRADITIONAL NEEDLES?

To the Editor:

Wolf et al¹ recently investigated the benefits of safety needle use in allergy practices. In view of their recommendation to question and possibly revise the Occupational and Safety Health Administration guidelines, their study requires some scrutiny.

With this retrospective e-mail survey, the authors conclude that there is an approximately 2-fold increase in accidental needle stick (ANS) injuries with safety needles compared with traditional needles. Although they acknowledge that there may be limitations with a retrospective e-mail survey study design, they do not discuss a number of significant biases. These limitations and biases (also present in the previous similar study by Kanter et al²) are numerous and significant enough to make the data almost impossible to interpret.

The questionnaire was sent only by e-mail to practices that had active e-mail addresses, creating the possibility of considerable selection bias so that the results cannot be generalized to all allergy practices. With a retrospective survey, recall bias can play a major role. Responders are more likely to report events that have occurred more recently. Since safety needles are new on the market, ANSs with safety needles are more likely to have occurred more recently than ANSs with traditional needles and hence are more likely to be remembered and reported by responders. Also, in a busy medical practice, a change can initially be met with resistance, particularly if it involves learning new techniques or altering old habits. Safety needles represent such a change. For those who must bear the financial burden, the higher cost of safety needles represents an unfavorable attribute. Because of these factors, ANSs are more likely to be reported if they occurred with safety rather than traditional needles (a form of response bias). There is also a high probability of nonresponse bias, since the response rate was only 28%. The experience with safety needles of nonrespondents was likely different from that of respondents. Nonresponse bias is inversely correlated with response rate^{3,4} and can be significant with such a low response rate but can even occur with response rates as high as 82%.⁵ The only way to reliably prevent recall and response biases is to have a controlled prospective study design.

The ANS rates are extremely small: the highest rate in the study was approximately 40 per million injections. When the numerator of a rate is small and the denominator is large, the chance of detecting a difference between 2 rates is high. This is called a type I or α error: rejecting the null hypothesis when it is actually true.⁴ In this situation, looking for a P value of less than .001 would be more appropriate (stringent cutoff for the probability of the difference occurring by chance). The authors report a P value of less than .01 but do not mention

the exact P value, so we do not know if it would meet this more stringent criterion. Also, for this study, a simple t test is not the appropriate statistical test. Comparison of 2 or more aggregate rates can be misleading. Since there are 2 data points for each practice, the paired t test is more appropriate.

The data are further clouded by the fact that only approximately 50% of users activate the safety cap.¹ We do not have any information about whether the ANSs with safety needles occurred in users while trying to activate the safety mechanism, before activating the safety mechanism in users who intended to activate it, or in users who had no intention of activating the safety cap. Without these data, and with a rate of compliance of only 50%, it is extremely difficult to draw any firm conclusions.

As with any new device, it takes some time for the user of a new safety needle to become fully comfortable with its use. Therefore, one would expect that there would be a higher rate of ANSs in practices that have recently introduced safety needles and lower rates in practices that have used them for some time. This element of length of experience was not addressed in the studies by Wolf et al¹ or Kanter et al.²

Despite the fact that there are a number of limitations and biases, the recent study by Wolf et al brings attention to an important issue. The authors are correct in stating that we need "a multicenter prospective trial to examine the impact of safety needles in outpatient allergy practices."¹ Until we have such a study, we cannot assume that safety needles are safer than traditional needles. However, we also cannot conclude that they are less safe.

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The above correspondence was referred to the original authors who provided the following response:

We acknowledge that our retrospective survey regarding “safety” needle use in outpatient allergy patients has limitations. The questioning of certain possible biases is legitimate. Perhaps our survey results should not be generalized to all allergy practices, but they are surely specific to all practices that reported higher accidental needle sticks when using safety needles. The Occupational Safety and Health Administration’s current policy regarding safety needle use in outpatient practices was instituted in the absence of any directly relevant safety data. Likewise, approval of multiple safety devices without comparative safety trials further obscured the landscape.

With an intrinsically safer needle, one should not expect an increased rate of accidental needle sticks even during the period of transition to their use. Although we cannot firmly conclude that safety needles are less safe, our data¹ and those of Kanter et al² imply that the reality of safety needle use in the outpatient setting remains to be determined. In other words, the obverse of what you say is not necessarily true. The literature and political actions are not validated by what we know or what we observe.

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EXERCISE-INDUCED ANAPHYLAXIS CAUSED BY WHEAT DURING SPECIFIC ORAL TOLERANCE INDUCTION

To the Editor:

Specific oral tolerance induction (SOTI) is a new approach recently proposed for children affected by persistent food allergies.¹ It consists of administering orally the offending food, starting with very low dosages and increasing slightly to achieve the ingestion of the usual daily intake. Many questions are being asked about this treatment, including whether it is safe. We report a possible complication during SOTI for wheat.

A 15-year-old boy started SOTI because of multiple and persistent food allergies. At the age of 5 months, he developed urticaria-angioedema after the first ingestion of wheat. The results of skin prick tests and an open controlled chal-

lenge were positive for wheat; thus, wheat was eliminated from the boy’s diet (Table 1). In the following years, other oral challenges produced positive results for wheat, milk, and egg. In addition, at the ages of 9, 10, and 13 years, the boy also developed anaphylaxis caused by peanuts, lentils, and fish (gilt-bream), respectively.

At the age of 15 years, he underwent an open oral challenge for wheat. After eating the first bit of bread, he experienced itching of the throat and some hives on the neck. Despite this, the test was performed with increasing doses until reaching approximately 10 g of bread. Then, because of the appearance of rhinitis and ocular itching, he refused to continue.

SOTI was started the next day: a small bit of bread once a day (approximately 1 g), with small, incremental, weekly increases. In the following days, he continued to have oral itching and a few hives after the ingestion of bread. Three weeks later, with the increase of bread ingestion (approximately 5 g), he experienced slight abdominal pain for several days, which regressed when the amount of bread was decreased. Afterward, these symptoms disappeared, and the child was able to increase the amount of ingested wheat. Thus, 4 months later, he ate approximately 100 g of bread per day, until the day he developed anaphylaxis (spreading urticaria, angioedema of the lips, rhinitis, and asthma) during a football match. This was the first time that he had eaten wheat before (2 hours) exercising. A careful clinical history excluded the possible ingestion of other causative allergenic foods or possible contributing factors. Exercise challenge after an intake of wheat was not performed because of lack of informed consent.

In the following days, he continued to ingest lower (50 g) amounts of bread, avoiding exercise in the 4 hours after the meal, and again slowly increased the intake to approximately 200 g/d for 1 year, without any symptoms. Finally, he occasionally practiced exercise after ingesting a meal that contained wheat, without experiencing recurring symptoms.

Food-dependent exercise-induced anaphylaxis is believed to be a distinct form of food allergy, because the symptoms are induced by physical exercise after ingestion of causative food.² Although various foods have been reported to be the cause of food-dependent exercise-induced anaphylaxis, wheat is the most frequent.³ It was hypothesized that food-

Table 1. Skin Prick Test Results to Main Food Allergens at Follow-up

Food	Medium wheal diameter, mm				
	6 mo	3 y	7 y	13 y	15 y
Wheat	7	9	9	9	8
Milk	8	10	11	12	11
Egg	9	9	8	8	9
Peanut			7	7	7
Lentil			6	7	6
Gilt-bream			8	9	9

dependent exercise-induced anaphylaxis represents the clinical symptoms of food allergy in patients whose immunologic reactivity is low and who need an additional trigger for their symptoms to occur.^{4,5} Our case seems to support this hypothesis and suggests that exercise should be avoided in the hours after the consumption of wheat during SOTI.

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ALLERGIC CONTACT STOMATITIS FROM ORTHODONTIC RUBBER BANDS

To the Editor:

Allergic contact dermatitis (type IV or delayed-type hypersensitivity) from natural or synthetic rubber products is caused by chemicals, such as thiurams and carbamates, added during the manufacturing process.¹ Reported herein is a case of allergic contact stomatitis caused by orthodontic rubber bands.

A 49-year-old woman reported that she had used plastic orthodontic aligners for 18 months without difficulty. Her orthodontist had recently modified the aligner to allow the attachment of an orthodontic rubber band to provide additional adjustment of a particular tooth. The band was changed daily for a fresh new one but was worn constantly. Two weeks later, the patient developed a stomatitis. She described this as sore gums and blisters in her mouth not only immediately adjacent to the rubber band but more extensively as well. The stomatitis was initially diagnosed by her orthodontist as an infection and treated with mouth rinses and later oral antibiotics, but the sores remained. Use of the rubber band was eventually discontinued, and the stomatitis resolved within 2 weeks. The rubber bands the patient had used are

reported to contain 95% to 98% natural rubber latex, 0% to 1.0% sulfur, 0% to 1.0% zinc oxide, 1% to 2.0% polymeric hindered phenol, and 0% to 1.0% dithiocarbonate derivative.

Delayed-type hypersensitivity testing was performed with a patch test panel of 23 common sensitizing agents (T.R.U.E. Test, Mekos Laboratories AS, Hillerød, Denmark). The panel includes some of the chemicals commonly added to rubber products, including carba mix, black rubber mix, mercapto-benzothiazole, mercapto mix, and thiuram mix. The panels were placed on the upper back as described in the package insert. In addition, 3 additional patch tests were performed by taping the following to the skin of the middle back, just below the T.R.U.E. test panel: a piece of a latex surgical glove, a piece of a latex toy balloon, and one of the actual orthodontic rubber bands the patient had been using. At 72 hours the T.R.U.E. test revealed a 3+ reaction to nickel. There was also a 2+ reaction to the orthodontic rubber band. There was no reaction to any of the other materials tested.

Hypersensitivity reactions to dental materials, whether used during a procedure or placed in the mouth longer term, have been reported.² Immediate-type reactions have most often been attributed to latex, and delayed-type reactions have most often been attributed to metals. Stomatitis from orthodontic rubber bands have been reported rarely.^{3,4} The patient described herein developed oral lesions after latex rubber bands were placed in her mouth. The lesions resolved when use of the bands was discontinued. She had a typical delayed-type hypersensitivity reaction on her skin to the same rubber bands that were in her mouth. Although one might have expected the standard patch tests or tests with other latex materials to be adequate for diagnosis, these materials did not cause positive delayed-type hypersensitivity reactions in this patient, yet a patch test with the actual suspected offending material (the orthodontic rubber band) gave a positive response that correlated with her clinical history. It can be assumed that the rubber band contains a chemical to which the patient is sensitized but that is not adequately represented in the other materials tested.

This case demonstrates 2 instructive principals. First, although not common, agents capable of causing allergic contact dermatitis can also cause stomatitis if the contact takes place in the mouth. Second, whenever possible, in addition to patch testing with standard panels, it is best to patch test with the actual suspected offending material as well.

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β_2 -AGONISTS AND PARESTHESIAS IN MULTIPLE SCLEROSIS

To the Editor:

A 57-year-old woman with multiple sclerosis (MS) was referred for tightness in her chest, shortness of breath, and the sensation of “not being able to take a deep breath.” These symptoms were worse at night and in heat and humidity and had occurred for a year, with improvement on breathing in “cold air.”

The patient was diagnosed as having MS in 1984. She has been taking fluticasone propionate and salmeterol for the past year and had tried nebulizers, but she experienced “tingling” in her hands after their use. Other medications included interferon infusions monthly; levothyroxine sodium, 150 μ g daily; amantadine, 100 μ g twice daily; donepezil, 5 mg daily; letrozole, 2.5 mg daily; and oxybutynin chloride, 5 mg daily. She had a history of allergy to chicken (vomiting) and latex (pruritus).

Because of the development of “tingling” during her initial nebulization (on a separate date), a subsequent nebulization trial was given with isotonic sodium chloride solution, which did not result in tingling. However, a follow-up nebulizer therapy with albuterol again resulted in a sense of “tingling” in her hands. The results of spirometry displayed a decrease in forced expiratory volume in 1 second (5%), no change in the ratio of forced expiratory volume in 1 second to forced vital capacity, and an increase in forced expiratory flow between 25% and 75% (12%), which did not correlate to her shortness of breath and are probably not attributable to asthma, although the patient complained of “tingling” after albuterol nebulizer therapy.

MS impairs respiratory functions, which increases with disability level.¹ In a study by Edwards and Constantinescu² that examined the prevalence of conditions associated with MS, asthma was found to be significantly more prevalent in this population. In contrast, a study from Wales found an inverse relationship between asthma and MS.³ Recommendations for the treatment of MS include β_2 -agonists because of the limited immunomodulatory effects of interleukin 12, which may be important in MS.⁵

β_2 -Agonist adverse effects are common in asthmatic patients. Commonly reported adverse effects attributed to bronchodilators are tachycardia (64%), jitteriness (60%), shaky hands (43%), and restlessness (42%).⁶ Specifically, β_2 -agonists have been found to significantly increase tremor in a dose-dependent fashion.^{5,6} Table 1 lists the prevalence of paresthesias from various β_2 -agonists.

Our patient experienced paresthesias in her hands after completing nebulizer therapy with albuterol. It is unclear whether β_2 -adrenergic receptor agonists exacerbate the symp-

Table 1. Prevalence of Paresthesias Among β_2 -Agonists^a

β_2 -Agonist	Prevalence of paresthesias
Albuterol sulfate	
AccuNeb	Not mentioned
Proventil 0.083%	Not mentioned
Proventil HFA	Not mentioned
Ventolin HFA	Not mentioned
VoSpire Extended Release	Not mentioned
Xopenex HFA	Not mentioned
Xopenex Solution (0.31, 0.63, 1.25)	<2%
Combivent (+Ipratropium)	<2%
DuoNeb (+Ipratropium)	Not mentioned
Metaproterenol sulfate	
Alupent	Not mentioned
Pirbuterol acetate	
Maxair Autohaler	<1%
Salmeterol xinafoate	
Advair Discus (+Fluticasone)	Observed in clinical practice
Serevent Diskus	1%–3%
Formoterol fumarate	
Foradil Aerolizer	Not mentioned

toms of MS or if albuterol has a causal relationship to paresthesias; thus, allergist-immunologists need to be aware of these possible effects in the care of patients with MS.

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