

Challenge sting: to bee or not to bee*

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INTRODUCTION

In this issue of the Annals, Drs Brown and Tankersley have produced a fine allergic perspective on the topic of Honeybee stings. While discussing the diagnostic tests available, they mention live sting challenges commenting that this remains controversial.¹ This provides an opportunity to discuss whether sting challenges should be considered as part of a routine evaluation for Hymenoptera stings within the framework of the current practice parameters.² The current parameters state:

Approximately 25% to 70% of patients with a history of anaphylaxis from an insect sting and detectable venom-specific immunoglobulin E antibodies by means of skin testing or in vitro testing will experience a systemic reaction when re-stung.³⁻¹⁰ An intentional sting challenge has been recommended by some to better select those patients who need venom immunotherapy (VIT).^{3,11} Patients allergic to honeybees are more likely to have positive sting challenge results than those allergic to yellow jackets.³ Sting challenges, however, are neither consistently reproducible nor without risk. About 20% of patients who do not react to a sting challenge will react after a second challenge.⁵ In addition, serious allergic reactions, such as anaphylaxis necessitating intensive care treatment, have occurred from these challenges. The use of sting challenges requires special centers because of the risk of serious reactions and is impractical as a general prerequisite for VIT in the United States.^{12,13}

In endorsing this recommendation, there is one essential premise that must be stated. Given that insect stings in hypersensitive patients may be fatal and that we have a highly effective therapy (VIT), it is absolutely essential that we establish who may benefit by receiving VIT. This premise then places a premium on sensitivity, that is, we must ensure that we include all patients who may potentially benefit from VIT. To this end, it has been recommended that repeated testing for specific immunoglobulin E be performed until the

physician is confident that the results are truly negative, especially in patients with a history of severe anaphylaxis.^{1,14}

The counterproposal to use sting challenges completely misses this premise. Intuitively, a sting challenge would seem to be the criterion standard for testing for insect hypersensitivity. After all, we would not be using any surrogate marker but would instead be reproducing the natural occurrence itself. What we have intuitively recognized is that sting challenges are 100% specific. Clearly, individuals who have reacted to a sting challenge can benefit from VIT. What we are forgetting is the natural history of hymenoptera stings, which is that not every sting produces a systemic reaction, even after a previous systemic reaction. This is clearly supported by studies^{2,14} in which sting challenges are performed in patients with previous systemic reactions to stings showing only 30% to 60% reaction rates. Even repeated challenges pick up only an additional 20% of those with initially negative results.^{3,4,9} Therefore, sting challenges have poor sensitivity and, thus, are a poor choice for routine testing for hymenoptera sensitivity.

One guiding principle in diagnostic testing is to minimize risk to the patient from the test. Once again, sting challenges fall far short of this ideal. In fact, a positive sting challenge, by definition, requires the patient to have systemic symptoms of anaphylaxis, and these can be quite severe.^{3,4,15} Franken et al⁵ reported 6 severe reactions in 61 sting challenges, van der Linden et al³ had 38 Mueller grade 3 or 4 reactions in 324 stings, and Smith et al¹⁵ reported on 2 very severe and prolonged anaphylaxis cases in 22 sting challenges.

Now let us suppose that we made sting challenges a requirement to give people immunotherapy. Will there be an occupational risk to our employees? Will regulations from governmental agencies, such as the Occupational Health and Safety Administration, be established? Will we incur potential liability from other patients attending our clinics who are accidentally exposed to a sting? Will we not be able to obtain live insects? There are no vendors for them at this time. Because there are no procedure codes, will we not get paid for this procedure? Will any of our patients with a history of insect sting hypersensitivity reaction not be willing to be tested by a sting challenge? A “yes” answer to any one of these questions makes sting challenge an unacceptable alternative to current testing.

Finally the current practice parameters do not exclude sting challenges. They only stipulate that they are impractical in

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the usual clinical setting. Consequently, sting challenges in research settings in special centers are not precluded.

In conclusion, there is no reason to change the current practice parameters with respect to sting challenges. Sting challenges do not add anything to current diagnostic testing, but they do increase risk. They are impractical in the usual clinical setting, and, finally, they are not precluded by the practice parameters but are just restricted to special centers.

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