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# The wasp-horsefly syndrome

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## KEY WORDS

*Horsefly, Diptera bites, Hymenoptera allergy*

## SUMMARY

*Here are two cases of two male patients of 57 and 62 years of age, already known as allergic to stinging hymenoptera venom, who after a horsefly bite have presented a serious 3-4 degree-type Mueller classification systemic reaction. The diagnosis has been carried out clinically and after an accurate environmental anamnesis and along with prick tests and RAST, further specific entomological confirm. In literature the so called wasp-mosquito-syndrome has been indicated where hyaluronidase has been referred to as the cross allergen, between the hymenoptera venom and the mosquito saliva, which likely triggers the reaction. We believe that it is also possible to take into consideration a wasp-horsefly-syndrome as well, supposing the increased risk of anaphylactic reactions to Tabanidae bites, relatively frequent in areas with animals and streams, in subjects sensitized to stinging hymenoptera. We also suggest the possibility that in these subjects some systemic reactions are due in fact to Tabanidae bites and not so much for the failure of a possible active ITS of stinging hymenoptera.*

## Introduction

In literature several are the indications telling us that in subjects sensitive to hymenoptera bites there is a high risk of triggering systemic reactions, up to anaphylaxis(1, 2) after the bite of some blood sucking diptera and in particular *mosquitoes (Aedes c.)*.

Therefore the so called wasp-mosquito syndrome has become relevant and a detailed analysis has indicated hyaluronidase as the cross allergen between the hymenoptera venom and the diptera saliva which likely triggers the reaction. It is not clear if this syndrome involves exclusively *mosquitoes* or it can also be considered for other Diptera families such as *Tabanidae* (3, 4) which can be responsible for systemic reactions. We have recently published

an article about the case of a subject sensitive to hymenoptera with a 2-3 degree Mueller reaction who had also suffered from an anaphylactic reaction after a *Hippobosca equina* (horsefly), a Diptera of the superfamily of the *Hippoboscoidea*, present in our rural areas and near horses (5).

Therefore we believe it is of interest to report our clinical experiences concerning two patients allergic to hymenoptera who have suffered from an anaphylactic reaction to both insect species (*vespula* and *tabanidae*).

We believe that along with a wasp-mosquito syndrome it is also possible to take into consideration a wasp-horsefly syndrome agreeing with what has been presented by Freye and Litwin (6) who have supposed a higher risk of anaphylactic reactions to Diptera bites, relatively frequent, in subjects sensitized to hymenoptera.

## Case reports

### Clinical case 1

A 57-year-old male, with a positive anamnesis to hymenoptera venom sensitization for a previous urticaria with dyspnea, dysphonia and hypotension after a *Vespula* sp. sting, was bitten on the neck by an unidentified insect described as of a grey colour and with a lengthened body. Just after a few minutes the patient manifested angioedema of face and general urticaria, feet and tongue paraesthesias with a temporary loss of consciousness. He was successfully treated by the ER, where he remained under observation until the next day when he was dismissed. The insect was killed and later kept by our patient, it was identified as a horsefly (*Haematopa pluvialis*) giving us further evidence to the lack of responsibility by the hymenoptera role as the anaphylaxis trigger factor.

### Clinical case 2

A 62-year-old patient suffering from hypertension and allergic to hymenoptera venom with a previous Mueller 3-type reaction, under treatment with specific immunotherapy of *Vespula* sp venom (ITS). While being outside near

some grazing cattle, he was bitten on the arm by a yellow or green insect, very much like a wasp. He showed pain on the bite site with a slight blood drip and after 5' a general urticaria appeared with initial dyspnea and loss of consciousness, so serious as to use adrenaline. About 6 months later he was bitten again and presented the same symptoms but this time he was able to capture the insect and we found out, surprisingly enough, that it was not a *Vespula*, which from the description could have easily been, but a horsefly, the *Chrisops* sp., which looks very similar to hymenoptera and it is very common in rural areas near streams and animals.

## Materials and methods

### Live Test

For the diagnosis we have performed intracutaneous tests with hymenoptera venom available on the market (Pahrmalgen, Alk Abellö) and prick tests for Diptera (Stallergens) with a mix of *Aedes* c. and *Tabanidea* whole body. The test with readings after about 15-20 minutes was considered positive with the result of a  $\geq 5$  mm pomphus along with erythema. Histamine at 1% and human

**Table 1** - Diptera classification

Order	Sub-order	Division	Superfamily	Family	Species		
Diptera	Nematocera	Tipulomorpha	Tipuloidea	Tipulidae	<i>Stipula</i> sp		
		Culicomorpha	Culicoidea	Simuliidae	<i>Simulium</i> d.		
	Brachycera	Ortorrapha		Tabanoidea	Tabanidae	<i>Crysops</i> sp <i>Tabanus</i> sp <i>Hematopota pluvialis</i> .	
		Cyclorrapha			Asiloidea	Asilidae	<i>Laphria</i> sp
					Tephritoidea	Tephritoidar	<i>Anastrepha fraterculus</i>
					Drosophiloidea	Drosophiloidae	<i>Drosophila melanor</i>
							<i>Drosophila suboscuro</i>
					Hippoboscoidea	Glossinidae	<i>Glossina morsitans</i> <i>Glossina palpalis</i>
						Hippoboscidae	<i>Ornithomia avicularia</i> <i>Liptotena cervi</i> <i>Ornithoica vicina</i> <i>Hippobosca equina</i>

albumin have been used as respectively positive and negative control.

#### *In-vitro Test*

The total and specific IgE dosage for hymenoptera and diptera venom on a serum sample has been carried out with the CAP system by Pharmacia, following the instructions included in the kit.

#### Discussion

In the two reported cases the diagnosis has been carried out clinically and after an accurate environmental anamnesis with a further specific entomological confirm, with skin prick-tests with *Tabanidae* sp. whole body resulted positive and with RAST which resulted positive in the second patient (5.4 U/ml) for *Tabanidae* sp.

For the time being lacking a purified allergen extracted from diptera salivary gland (7) we have no diagnostic reliability apart from the clinical one. Up to now all available data is the one between mosquito and wasp, reported by Sabbah, which shows to the electrophoresis a protein common to both extracts of 44kD, similar to the hyaluronidase. The author also supposes the possibility of a cross-reaction also in *Tabanidae* (4). Since blood sucking diptera taxonomy is quite complex (8) and each species is peculiar to area, environment and seasonal distribution and to all different saliva compositions (9), it will be fundamental to go deeper into our knowledge. These two cases increase the number of this type of reports and give support to the suspect that, due to the wide diffusion of Diptera(10), some systemic reactions must be due in fact to *Tabanidae* bites (11) and/or *Hippoboscidae* (5) and not so much as an ITS failure. To enlighten this concept it is therefore fundamental to improve our knowledge as for *brachycera-diptera* taxonomy (Tab. 1) which is extremely complex and also to go deeper in our studies aiming at the

identification of cross-reaction antigens between Diptera and Hymenoptera as to implement a specific immunotherapy able to protect people even from horseflies and *Hippobosca equina*.

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