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## Caso clínico

### Anaphylactic reaction after *Hippobosca equina* bite

A 48-year-old female received the bite of an unidentified insect in summer time. Almost immediately she experienced generalized pruritus. Then she developed urticaria, abdominal pain, nausea, angioedema on the face, and dyspnoea. Afterwards, in the out-patient department, she underwent an allergic screening through skin prick tests to *Hymenoptera* venom and dosage of specific IgE (Cap System). They revealed sensitization to *Apis m*, *Vespula sp* and *Polistes sp*. In fact the patient reported urticaria and angioedema after previous *Hymenoptera* stings. We performed a skin prick test with *Tabanus* extracts and obtained a positive reaction (wheal 5 mm). Later on, the patient captured the culprit insect and, after having consulted an entomologist, we were able to identify it as a fly from *Hippoboscidae* family: *Hippobosca equina* (H. e.). However, we cannot fully rely on skin prick tests and specific IgE, since for the time being the extract for H. e. allergy is not available. Our case is the first clinical report of an allergic reaction after the bite of *Hippobosca. e* in a patient with sensitization to *Hymenoptera* venom.

**Palabras clave:** Anaphylaxis. Cross-reaction. *Hymenoptera*. *Diptera*. *Hippobosca equina*.

Anaphylaxis to the sting of insect in Italy is very frequent, especially to *Hymenoptera* family<sup>1</sup>. Anaphylaxis to the bite of *Diptera*, specifically the bite of *Tabanidae* family (horsefly) has been sparsely documented<sup>2</sup>. In our country we have many insects that belong to *Diptera* order, like *Tabanus*. Particularly, in our areas, rich of grazing, riding school and wild animals, lives a particular insect that belongs to *Diptera* order: *Hippobosca equina*. *Hippobosca equina* (H. e.) is a hematophage two-winged fly. It belongs to the order of *Diptera*, family of *Hippoboscidae*, different from *Tabanida*<sup>3</sup>. Similar in shape to the horse fly from the family of *Tabanidae*, it has pointed proboscis which sucks blood from mammals. It's known with the name of louse-fly because of its behavior. In fact this insect stays attached to animals after bite. Blood-suckers *Diptera*, that belong to *Hippoboscoidea* superfamily, are well known to be carriers of serious infective diseases<sup>4,5</sup>. Both families belong to the sub-order of *Brachycera*.

To our knowledge, anaphylactic reactions to *Hippobosca equina* bite have not yet been reported.

## CASE REPORT

The patient was a 48-year-old female farmer, resident in a rural area. She first came in Emergency department after a bite of an unidentified insect in summer time. She immediately experienced generalized pruritus and

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then she developed urticaria, abdominal pain, nausea, angioedema on the face, and dyspnoea. On arrival at the emergency department, she was treated with antihistamines and corticosteroid i.v. Systemic symptoms remitted in four hours, but urticaria disappeared in a few days.

Afterwards, in the out-patient department, she underwent an allergic screening through skin prick tests to *Hymenoptera* venom and determination of specific IgE (Pharmacia Cap System). They revealed sensitization to *Apis m.*, positive at concentration of 1 mg/ml, to *Vespula sp* at 1 mg/ml, to *Polistes sp* at 1 mg/ml; specific IgE were positive, too (*Apis m* 4.91 U/ml, *Vespula sp* 6.86 U/ml, *Polistes sp* 1.13 U/ml). In fact the patient reported urticaria after previous *Hymenoptera* stings.

The hypothesis of *Hymenoptera* as causative agent of this episode was not fully convincing because of the lack of the sting inside the skin, characteristic of bees and because of the different shape of the responsible insect from *Vespidae*, with whom the patient was familiar with from previous stings.

Therefore we performed a skin prick test with commercial extract of *Tabanus*, obtaining a positive reaction (wheal 5 mm); *Tabanus* specific IgE were weakly positive (1.37 U/ml).

Three months later the patient received another bite, with urticaria and angioedema again. In this episode, the patient captured the culprit insect and, after having consulted an entomologist, we were able to identify it as an insect from *Hippoboscidae* family: *Hippobosca equina* (*H. e.*) (fig 1). The close temporal correlation between the in-

sect bite and the anaphylactic reaction, is likely to be the allergic origin of the reaction, caused by *Hippobosca e.* bite. However, we cannot fully rely on skin prick tests and specific IgE, since for the time being the extract for *H. e.* allergy is not available

## DISCUSSION

There are 150.000 different kinds of true flies (*Diptera*), including 3.500 different kinds of horseflies<sup>6-8</sup>, belonging to different families (see table 1).

More than 30 cases of horsefly allergies have been recorded so far, involving systemic reaction: all were from *Tabanidae* family. Only one systemic allergic reaction to *Hippoboscidae* superfamily, in our knowledge, has been reported, after a bite of *Glossina morsitans* (tsetse fly) that belongs to *Glossinidae* family<sup>9</sup>. *Glossina* is the nearest living relative of the member of *Hippoboscidae* family. This fly lives in Africa, in the desert and warm regions, but is not present in our areas.

Several reports<sup>10</sup> on the high risk of systemic reaction after *Diptera* bites in patients allergic to *Hymenoptera* venom led the definition of Wasp-Mosquito Syndrome<sup>11</sup>.

It's not clear if this data takes into consideration only mosquitoes, or may be extended to all *Diptera* order, like *Tabanidae*, *Glossinidae* and *Hippoboscidae*.

Our case is the first clinical report of an allergic reaction after the bite of *Hippobosca e.* in a patient with sensitization to *Hymenoptera* venom. A cross-reaction be-

**Table 1.** *Diptera* classification

Order	Suborder	Division	Superfamily	Family	Species	
Diptera	Nematocera	Tipulomorpha	Tipuloidea	Tipulidae	<i>Stipula sp</i>	
		Culicomorpha	Culicoidea	Simuliidae	<i>Simulium damnosum</i>	
	Brachycera	Ortorrapha	Tabanoidea	Tabanidae	<i>Crysops sp</i>	
					<i>Tabanus sp</i>	
					<i>Haematopota pluvialis</i>	
		Cyclorrhapha	Asiloidea	Tephritoidea	Drosophiloidae	Asilidae
						<i>Laphria sp</i>
						Tephritidae
						<i>Anastrepha fraterculus</i>
						<i>Drosophila melanogaster</i>
Hippoboscoidea	Glossinidae	<i>Drosophila suboscuro</i>				
		<i>Glossina m. morsitans</i>				
		<i>Glossina palpalis</i>				
		<b>Hippoboscidae</b>				
<i>Ornithomyia avicularia</i>						
<i>Liptotena cervi</i>						
<i>Ornithoica vicina</i>						
<b><i>Hippobosca equina</i></b>						

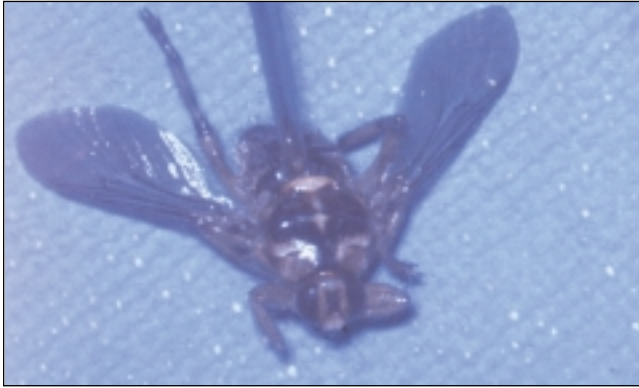


Fig. 1. A specimen of *Hippobosca equina*, captured by our patient.

tween *Hippobosca* and *Hymenoptera*, like the one existing between *Hymenoptera* and *Tabanidae*, is supposable. Studies on the possible cross-reaction between *Hymenoptera* venom and *Diptera* salivary glands are strongly required.

In conclusion, a clear taxonomical knowledge when analysing this order of insects is not just for pure academic reasons. In fact it's very important to know their different habitats, seasonal cycles and behaviour. In fact *Tabanus* lives near rivers and lies in wait in shady areas under bushes and trees for a host to happen by and it doesn't need the presence of wild animals in its area. *Hippobosca e.* lives in stables and kennels, laying eggs in fodder and litter and needs the presence of wild animals in its habitat. In our hilly and rural environment, with lots of sheep, goats, horse-breeding and wild animals, it's essential to know the different families of existing *Diptera*, especially *Hippobosca equina*, because their bites may sometimes cause even very severe reactions. Furthermore,

the presence of *Hymenoptera* in the same area needs a good taxonomical knowledge, essential to ease the diagnostic, preventive and therapeutic intervention.

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