

Safety and efficacy of immunotherapy with *Polistes dominulus* venom: results from a large Italian database

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Polistes genus is widely spread in Europe and in the rest of the world. *Polistes dominulus* (PD), *Polistes gallicus* and *Polistes nimphus* are common in the Mediterranean area, where they are responsible for hymenoptera venom allergy. Until 1996, the only commercially available extract for diagnosis and immunotherapy (VIT) was a mixture of venoms from American species (*Polistes annularis*, *Polistes fuscatus*, *Polistes metricus* and *Polistes exclamans*), which are not represented in Europe, and are, at least in part, immunologically different. In 1997, the PD extract was introduced in Italy, where it rapidly replaced the previous vaccine. To date, hundreds of patients have been treated with the PD extracts, so that we can report the results of our 10-year experience with PD venom.

The clinical data of patients, fulfilling the prescription criteria, and undergoing VIT with PD extracts at several allergy centres in Italy (Como, Verona, Ancona, Rimini, Florence), were collected in a database. The diagnostic procedures were the same at all centres, including prick and intradermal tests and CAP-RAST assay. The tests were

performed with extracts of *Apis mellifera*, *Vespula* species (Stallergènes, Milan, Italy), PD and *Vespa crabro* (Anallergo, Florence, Italy). *Polistes dominulus* immunotherapy was given according to a cluster schedule. The maintenance dose was reached in three sessions (every other day, with a total of 10 injections) with an aqueous extract. The maintenance dose (100 mcg/ml venom tyrosine-adsorbed) was then given monthly. In the case of multiple VIT, injections were given with an interval of at least 30 min.

Starting from 1998, 426 patients (age range 7–76, 319 male) received VIT with PD extract. Their clinical history included: 28 (7%) grade I systemic reactions, 68 (16%) grade II, 147 (34%) grade III and 183 (43%) grade IV. Fifty-seven subjects were monosensitized to PD. According to the results of diagnostic work-up, 190 patients received VIT with PD only, 228 received one additional venom and eight received two other venoms. Venom immunotherapies had a mean duration of 29.8 ± 22.2 months, the mean number of injections per patients was 35 ± 22 and 14 746 total injections of PD vaccine were given. There were 18 adverse events in 11 patients (2.58% of patients and 0.12% of injections). Sixteen reactions occurred during the build-up (four grade II in one patient, one grade I in one patient and 11

large local reactions in seven patients), and two (local) during the maintenance phase. Of the 426 patients, 114 (27%) were re-stung (1 to 5 times) on field, all during the maintenance therapy. Of them, 104 unequivocally recognized PD as the stinging insect. The outcome of VIT at PD re-stings was favourable, as shown in Table 1. The two patients with a grade IV and a grade III reaction after VIT, resulted to have systemic mastocytosis, and had the dose increased to 200 mcg. One of them was re-stung by PD and had only a large local reaction.

Until 10 years ago, the only available extract for *Polistes* allergy in Italy was a mix of American species, which are not represented in our country. Moreover, there are important immunological differences between European and American species. Sanchez et al. (1) in RAST-inhibition experiments confirmed that there were species-specific allergenic differences, and it was shown that Antigen 5 and Phospholipase of PD differ in the amino-acid sequence from those of American *Polistes* (2). In an Italian study, it was shown that protease is an important allergen of the venom of the European species (3), and RAST-inhibition studies (4, 5) suggested that the cross-reactivity between the venoms of American and European species is partial, because the venoms of European *Polistes* possess exclusive allergens. These studies suggest that *in vivo* and *in vitro* tests with PD venom could be more sensitive in European patients, and that omitting the use of PD venom could lead to ineffective VIT (6) or misdiagnosis. After 10 years of clinical use of PD extract, the data from more than 400 patients show very favourable results. The majority of patients were efficiently protected at re-sting and the rate of adverse reactions was 12 per 1000 injections, in agreement with the figures reported for other venoms.

Table 1. Outcome of VIT at the PD re-stings in the 104 patients who recognized the insect

	Before VIT N	After VIT N
No reaction	–	67
Local	–	26
Grade I	–	8
Grade II	–	1
Grade III	24	1
Grade IV	80	1

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