

## Vaccination in dogs: an essential preventive measure, but one that should be used with care

Vaccines are widely used in dogs and are a pillar of preventive veterinary medicine.

Although commonly used and sometimes trivialised, they are still medicinal products and can cause adverse effects, as stated in their summary of product characteristics (SPC). These effects are rare and mostly mild: local reactions at the injection site, a transient mild fever and occasional digestive disorders can all be observed. However, far more serious adverse effects can sometimes occur, such as anaphylactic reactions<sup>1</sup>, which are well known and potentially fatal post-vaccination phenomena.

In order to analyse these serious adverse effects (SAEs) observed in dogs following vaccination, a five-year retrospective study was carried out by the French Agency for Veterinary Medicinal Products (ANMV) between 1 January 2012 and 31 December 2016<sup>2</sup>.

Reports corresponding to cases considered non-serious, cases considered serious but for which a cause other than the vaccine was identified (causality N: unlikely) or for which the data were insufficient to conclude (causality O/O1: unclassifiable/inconclusive) were excluded from the study<sup>3</sup>.

During the study period, 62 different vaccines marketed in France were mentioned in at least one report. The number of valences<sup>4</sup> contained in each vaccine varied from one to nine. Sales figures for the different vaccines studied were provided by the marketing authorisation holders. Based on these data, it was estimated that 21,303,160 dogs were vaccinated during the five years of the study, i.e. an average of 4,260,632 dogs per year, which corresponds to 58% of the French dog population (7,340,000 individuals according to FACCO-KANTAR TNS<sup>5</sup>).

### Results

Over the period from 1 January 2012 to 31 December 2016, 2,083 reports concerning dogs were registered with the ANMV. Almost all of these adverse effects were reported by

veterinarians (98%), with owners accounting for only 2% of reports in this study.

Among these 2,083 reports, 1,313 were regarded as serious. Of these, 723 reports (789 dogs) where the causality was declared A (likely) or B (possible) were selected for analysis.

All vaccines combined, the SAEs occurred only very rarely: one SAE per 32,875 vaccinated dogs, or 0.37 cases per 10,000 vaccinated dogs.

The vast majority of reported SAEs were life-threatening anaphylactic reactions. They resulted in states of shock, which were regularly associated with other signs such as localised oedema (face, throat, limbs), urticaria, digestive disorders (vomiting, diarrhoea +/- haemorrhagic) and/or respiratory disorders (dyspnoea, cough, nasal congestion). In 70% of cases, these reactions were diagnosed within one hour of the injection.

In this study, the population's characteristics were taken into account when they were mentioned in the reports. Thus, of the 789 dogs concerned, age was recorded in 724 cases (92%), breed in 660 cases (84%) and weight in 521 cases (66%).

In 55% of the cases in this study, reports of SAEs concerned dogs under 1 year of age. This age group represents only 5% of the dog population in France (FACCO 2012-2016) but it is also the most widely vaccinated, as it is estimated that about 40% of the vaccine doses of the most common valences are used in dogs under 1 year of age.

Similarly, small dogs weighing 5 kg or less were also over-represented in our study compared to the weight distribution estimated by FACCO in its surveys between 2012 and 2016. This imbalance is partly explained by the over-representation of young dogs in serious cases (see below), but it was also found after puppies were excluded, as shown in the graph below.

1. Anaphylaxis can be defined as a severe, rapid-onset, life-threatening allergic reaction.

2. <https://pharmacovigilance-anmv.anses.fr/>

3. [https://ec.europa.eu/health/sites/health/files/files/eudralex/vol-9/vol\\_9b\\_2011-10.pdf](https://ec.europa.eu/health/sites/health/files/files/eudralex/vol-9/vol_9b_2011-10.pdf)

4. The part of a vaccine that provides protection against a single germ.

5. French Federation of Food Manufacturers for Dogs, Cats, Birds and other Pets

Lastly, certain dog breeds weighing less than 5 kg were mentioned most often, such as the Chihuahua, Yorkshire Terrier, Bichon or Shih Tzu (6%, 6%, 4% and 3.5% of reports respectively).

**Discussion and conclusion**

This study had a number of biases and limitations that need to be borne in mind when interpreting the results.

As the cases studied were spontaneous reports from the field, the first bias is the under-reporting of cases, which is difficult to assess, even though, according to a prospective study carried out by the ANMV [1], the percentage of cases reported compared to cases observed by veterinarians was around 10% in 2014. Regarding the use of vaccines, since all the reference figures remain estimates and current vaccination practices cannot be taken into account due to a lack of data (use of several doses combined in the same syringe or use of multivalents, several injections at different points, etc.), it remains very difficult to draw conclusions as to the vaccination practices posing the greatest risks.

Nowadays, vaccine injections tend to be trivialised due to their routine use, but they are medicinal products in their own right and can cause adverse effects. These effects are all the more difficult for owners to accept, as vaccination is a prophylactic

administered to healthy animals. Serious adverse effects, although very rare, make vaccination a controversial subject.

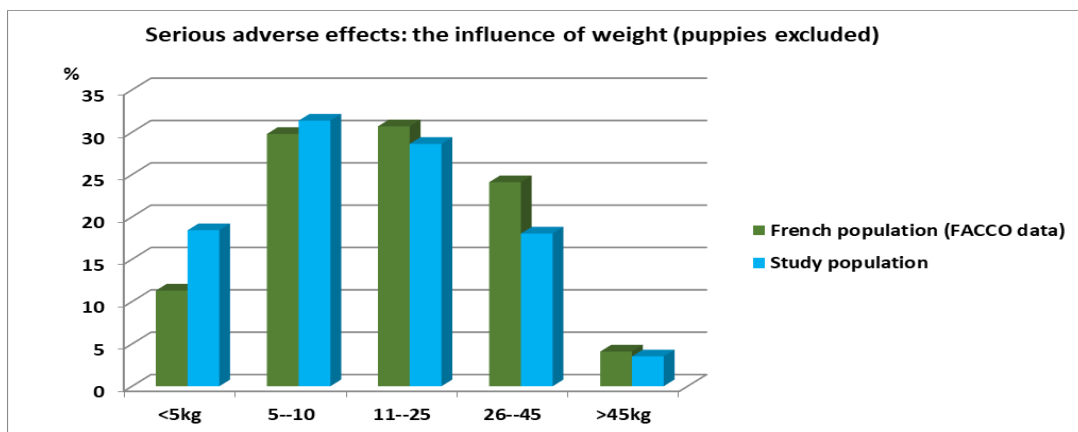
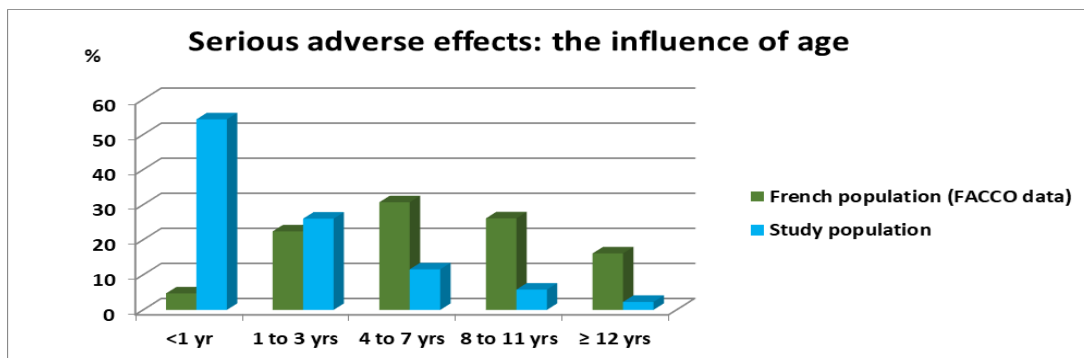
It is therefore important for the veterinarian to know how to adapt the vaccination protocols and the valences used to each animal, in order to provide the necessary protection with the least possible risk by avoiding unnecessary injections. Studies and recommendations on the subject are regularly published and can guide veterinarians in their choice of vaccine protocols [2, 3].

In dogs identified as being at risk of adverse effects (young dogs, small breeds, with an allergic predisposition, or having had a reaction to a previous vaccination), preventive measures can be implemented to limit the risk.

In addition, it is advisable to make all owners aware of the risks and the type of reactions that may occur following vaccination, as early action can improve the prognosis.

However, it should never be forgotten that the diseases against which dogs are vaccinated are often fatal and still frequently encountered, so the benefits of using vaccines in dogs are still generally greater than the risks, although these should always be weighed up for each individual.

Sylviane LAURENTIE (Anses-ANMV)



**References**

- [1] FRESNAY E, LAURENTIE S, ORAND J-P (2016). Etude de cas d'événements indésirables dus aux médicaments vétérinaires [Case study of adverse events due to veterinary medicinal products]. Bull. GTV, 80.
- [2] ANDREJAK J, Bonnes pratiques et prise en charge des effets indésirables de la vaccination chez le chien [Good practice and management of the adverse effects of vaccination in dogs]. Point veto, Nov 2018, N°390
- [3] Day MJ, Horzinek MC, Schult RD, Squires RA. Guidelines for the vaccination of dogs and cats, compiled by the Vaccination Guidelines Group (VGG) of the World Small Animal Veterinary Association (WSAVA) 2016;57(1):E1-E47.

**TO FIND OUT MORE, VISIT:**

Lohezic J, Fresnay E, Bégon E, Rougier S, Boullier S, Laurentie S. Effets indésirables graves des vaccins chez le chien : réalité chiffrée [Serious adverse effects of vaccines in dogs: a quantified reality]. Point vétérinaire, Nov 2018, N°390

**Definition of a serious adverse effect in animals**

When occurring in animals, a serious adverse effect is one that:

- causes permanent or prolonged symptoms,
- results in a congenital anomaly or malformation or causes major disability or incapacity in the treated animal,
- may be life-threatening or results in the death of the animal.