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Epidemiology of animal poisoning: An overview on the features and spatio-temporal distribution of the phenomenon in the north-eastern Italian regions

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ABSTRACT

In the present paper we analyze and discuss about the records referring to animal poisonings and poisoned baits cases covering the period between 2007 and 2013 and submitted for diagnostic investigations to the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe), which is the public veterinary health institute competent for the north eastern Italian regions.

All data were gathered by a passive surveillance system based on voluntary reporting, which became mandatory in 2009 after a decree of the Italian Ministry of Health had come into force. This prohibited the use and detention of poisoned baits and ordered to selected institutions and professionals to carry out standardized surveys to assess suspect and/or confirmed reported cases; all the necessary anatomopathological and toxicological investigations to confirm the reported cases were then performed for free by public veterinary health institutes whenever a veterinarian diagnosis or clinical suspicion were provided.

Totally, 1831 suspected animals poisoning and 698 cases of supposed poisoned baits recovery episodes were registered. 642/1831 (35.1%) animal poisoning cases were confirmed and the presence of toxic agents was verified in 292/698 baits (41.8%). The most severely affected territories were the ones with the highest level of urbanization and those most densely populated in the study area. Dogs and cats seemed to be greatly affected by poisoning cases and a characteristic seasonal trend was noticed, with an increase of episodes in late Winter/early Spring and in Autumn. Carbamate insecticides resulted to be the main cause for animal poisoning, while anticoagulants rodenticides played a primary role among toxicants found in poisoned baits. The presented results emphasize that malicious animal poisoning is a widespread problem in north-eastern Italy. The still relevant number of reported poisoning events caused by some banned pesticides poses the problem of identifying where these substances come from and brings to light the popular knowledge about the high toxicity of these compounds. Moreover, the noticeable increase of the number of episodes registered in 2009 pointed out how the above mentioned decree may have contributed to reveal a number of hidden cases which had not been investigated before, probably due to economic reasons related to the costs of toxicological analyses.

1. Introduction

The misuse or deliberate abuse of toxicant to kill companion animals and wildlife by means of poisoned baits is a remarkable issue and has been largely described in Italy [1–5], as well as in other European countries and worldwide [6–15].

The use of poisoned baits can be considered as a public health risk, mainly for the possible consequences and impacts on target and non-target organisms, including humans. Besides, animal poisoning has also great ethical and moral implications if we consider the strong relationship between humans and companion animals.

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A wide array of reasons may underlie the illegal killing of animals through poison. In urban settings, interpersonal conflicts such as neighbourhood problems and intolerance towards stray or owned animals are among the main causes, whereas in rural areas poison can be used to kill animals believed to negatively affect human activities such as hunting, farming, agriculture and truffle search.

The production of poisoned baits can be quite simple. Some highly toxic agents (e.g. pesticides) are easily available in the markets due to their extensively use for pest control, both in agricultural and in domestic practices. The selection of specific product for deliberate animal poisoning may depend on the popular knowledge about its toxicity and on its commercial availability [16].

The misuse of poisonous substances has been forbidden in Italy since 1934 (Italian Royal Decree no. 1265 of July 27, 1934 – Italian Official Journal no. 186, 1934), although poison has legally been used to eliminate wild predators up to 1977 (Italian Parliament Law no. 968 of December 27, 1977 – Italian Official Journal no. 3, 1977). Currently, the illegal killing of animals is also punished by the Italian Penal Code (Italian Parliament Law no. 189 of July 20, 2004 – Italian Official Journal no. 178, July 31, 2004). Due to the serious threat to public health and to the emotional impact that animal welfare issues have on the collective consciousness, the Italian institutions have shown a growing interest towards this phenomenon. A decree regarding the prohibition of the use and detention of poisoned baits endorsed by the Ministry of Labour, Health and Social Policies has been in force in Italy since January 2009 (Italian Ministerial Decree of December 18, 2008 – Italian Official Journal no. 13, January 17, 2009). This measure defines the role of institutions and professionals involved in the management of this issue and establishes that anatomopathological and toxicological investigations have to be performed for free by public veterinary health institutes whenever a veterinarian diagnosis or a clinical suspicion of malicious poisoning is provided.

Because of the great impact that this issue may have on public health and opinion, it is necessary that authorities implement effective measures in order to prevent, or at least minimize, the incidence of this harmful practice. Within this framework, it is of utmost importance to raise the level of awareness of this phenomenon by getting deeper insights on its extension and general features.

Hereby we present and discuss the records on animal poisoning cases as well as poisoned baits recovery episodes, submitted between 2007 and 2013 for diagnostic investigations to the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe), which is the public veterinary health institute competent for the north eastern Italian regions (Veneto, Friuli Venezia Giulia and Trentino Alto Adige).

2. Materials and methods

2.1. Surveillance system

The data used in this study derived from a passive surveillance system carried out on a voluntary basis until the end of 2008. Starting on January 2009, with the enforcement of the aforesaid decree of the Italian Ministry of Labour, Health and Social Policies reporting became mandatory. Whenever animal poisoning case is suspected by a practitioner veterinarian, from a clinical or anatomopathological point of view, and if private and/or law enforcement agencies staff find supposed baits, the local official veterinarian as well as the competent authorities have to be compulsory notified. At the same time, relevant samples useful to identify the potentially present toxic substance (carcasses, organs, other biological materials or baits), have to be collected and referred for necropsy and/or toxicological investigations to the local public veterinary health institute (in our case IZSVe), which performs the necessary tests as an institutional task, therefore for free. If the poisoning events are confirmed, the competent authority has to be notified and legal prosecution may follow.

2.2. Study area

The records described in the present study refer to three regions, i.e. Veneto, Friuli Venezia Giulia (FVG) and Trentino Alto Adige (TAA), located in north eastern Italy. The Veneto region includes seven provinces (Venezia, Belluno, Vicenza, Treviso, Padova, Verona and Rovigo), FVG four (Trieste, Udine, Pordenone and Gorizia) and TAA two (Trento and Bolzano) (Figs. 2 and 3). According to the Italian Institute of Statistic (ISTAT) Veneto is the largest region (18.407 km^2), followed by TAA and FVG (13.606 km^2 and 7.862 km^2, respectively) [17]. The resident population is distributed as follows: Veneto 4.857.210, FVG 1.218.985 and TAA 1.029.475 [18]. TAA has a predominant mountainous environment (100.0%), while FVG and Veneto are occupied by a mountainous territory in a percentage of 42.6% and 29.0%, respectively. Furthermore, the percentage of lowly urbanized territory is 90.0% in TAA, 75.3% in FVG and 52.2% in Veneto [17].

2.3. Analytical techniques

Semiquantitative analytical methods, considered to be fit for the purpose of our investigation [19,20] were used for the determination of toxicants in suspected poisoned baits or in tissue samples derived from a post mortem veterinarian examination, i.e. stomach or gizzard contents, vomit, gastric lavage, faeces, liver or other biological specimens.

The adopted analytical approach included a screening analysis and, if needed, the confirmation of the suspected toxicant. As a rule, the confirmation analysis was performed with a different analytical technique, or through the reprocessing in duplicate of the suspected sample, if alternative analytical methods were not available.

As suspected cases of poisoning may be caused by a wide range of toxicants, multiresidues analytical methods were preferred and applied for the determination of organochlorines, organophosphates, pyretroids, carbamates and anticoagulant rodenticides; otherwise for certain individual compounds, such as metaldehyde, strychnine or zinc phosphide, single residue methods were used. Analytical techniques of the employed methods, the number of compounds detectable for each toxic substance category and the relative limit of detection (LOD) are reported in Table 1.

2.4. Data management and statistical methods

All data used in the present study were extracted from the IZSVe laboratory information and management system and were reviewed and managed using the Microsoft Access 2007©. The recorded events for which toxicological investigations were requested were classified into two categories: "suspected animals poisoning cases", namely those episodes where animal biological samples were submitted to the laboratory alone or together with the baits supposed to be the cause of the death, and "suspected baits recovery cases". The latter included episodes when baits or undefined material were reported by the finders as laid out in forests, along paths or thrown into private gardens, being therefore potentially dangerous to animals and humans, especially children. Cases where one of the analyzed sample (e.g. animal organs or other biological materials, suspected foodstuff or baits) was found positive for at least one toxic substance were considered as "confirmed".