

## FREQUENCY OF SKIN TUMORS IN CÃES IN THE MUNICIPALITY OF TOLUCA: EXPLORATORY STUDY OF THE PERIOD 2002-2016

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*Elva Garcia*

Private practice

*Raul Fajardo*

Center for Research and Advanced Studies  
in Animal Health (CIESA) `` Universidad  
Aut3noma del Estado de M3xico `` (UAEM)

*Aide Alpizar*

Center for Research and Advanced Studies  
in Animal Health (CIESA) `` Universidad  
Aut3noma del Estado de M3xico `` (UAEM)

*Dionicio C3rdoba*

National Institute of Forestry, Agricultural  
and Livestock Research National Center  
for Disciplinary Research Microbiology  
(INIFAP-CENID).

*Jos3 Sim3n Mart3nez*

Center for Research and Advanced Studies  
in Animal Health (CIESA) `` Universidad  
Aut3noma del Estado de M3xico `` (UAEM)

*C3sar Ortega*

Center for Research and Advanced Studies  
in Animal Health (CIESA) `` Universidad  
Aut3noma del Estado de M3xico `` (UAEM)

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**Abstract:** A total of 229 skin tumors from the Center for Research and Advanced Studies in Animal Health (CIESA) compiled over a period of 15 years were analyzed with the aim of obtaining the frequencies of these tumors in dogs. In addition, a survey was carried out on cooperating dog owners, with the purpose of collecting information on the tumor risk factors present in the municipality of Toluca to reference dogs with tumors with these risk factors. Histopathologically, it was found that of all the tumors studied, 60% were benign and 40% were malignant. Mastocytoma (7.9%), fibroma (7.9%) and histiocytoma (6.1%) were the most frequent. It was observed that the breeds with the most frequency of skin tumors were Labradors (11.8%) and Creoles (9.6%). Canines from 7 to 15 years old presented tumors in 43%. And in males they were observed in 51.5% while in females 46.7%. In the survey carried out, it was observed that the most common existing breeds were the Creole (37.3%), Chihuahua (6.7%) and Schnauzer (6.6%). And the most frequent ages range from 1 to 7 years (62.1%). These results show that the characteristics of dogs with skin tumors and the Toluca canine population share similarities that can be studied in more detail for a better understanding of the disease. **Keywords:** tumors, skin, frequency, dog, Toluca.

## INTRODUCTION

A common health problem in veterinary practice is the appearance of tumors in dogs, and it is currently considered one of the main causes of death, this is because the canine population tends to live longer, therefore, to expose themselves for longer to tumor risk factors and therefore, to present chronic degenerative diseases.<sup>1,2</sup> Skin tumors are the most common in dogs, representing approximately a third of all tumors found in this species. This may be associated

with the fact that the skin is the most easily explored organ in the body.<sup>3,4</sup> Currently, some epidemiological studies from the United Kingdom, Denmark and Switzerland confirm that skin tumors are the most common in dogs.<sup>5,6,7</sup> There are various risk factors, including race and age, that predispose to the presentation of these tumors. Breeds such as the golden retriever, rottweiler, schnauzer and boxer show a high predisposition to skin tumors.<sup>5,8</sup> It has been described that the risk of developing tumors increases with older age, although some, such as histiocytoma, can occur in young animals.<sup>4,8</sup> Apparently, there is no relationship between tumorigenesis in this tissue and the sex of the canines.<sup>9</sup> In Mexico, epidemiological studies on oncology published in indexed scientific journals are limited to two works carried out by Fajardo et al., 2013 and Salas et al., 2015. The objective of this work was to obtain the frequencies of skin tumors diagnosed by histopathology, in the CIESA and reference them with the characteristics of the canine population of the municipality of Toluca, Mexico.

## MATERIAL AND METHODS

A retrospective study was carried out with data collected from the Center for Research and Advanced Studies in Animal Health (CIESA) of the Faculty of Veterinary Medicine and Zootechnics (FMVZ-UAEM) from the period 2002-2016. The database included only cases positive for tumors diagnosed by histopathology, adding data from the anamnesis; sex, age, race, location and diameter of the tumor, as well as the diagnosis issued.

To make a reference of the possible tumor risk factors present in the municipality of Toluca, 1,500 surveys were carried out among the cooperating population residing in this municipality in the period of 2015-2016 to reference the breed, age and sex of the dogs.

Statistical analysis was performed with STATA 7.0 using descriptive statistics.

## RESULTS

In the period 2002-2016, a total of 393 tumors in dogs were diagnosed in the CIESA laboratory, of which 229 were skin tumors. Of these tumors, in terms of biological/histological behavior, 60% were benign and 40% malignant. The tumors that were diagnosed most frequently during this period were mastocytomas (7.9%) and fibromas (7.9%), histiocytomas (6.1%) and trichoblastomas (5.7%) (Figure 1). 42.8% of the tumors had a diameter of 1 to 5 cm, only 3% were larger than 10 cm and were not related to malignant behavior. The breeds with the highest frequency of tumors were the Labrador (11.8%), Creole (9.6%), Schnauzer (8.3%) and Poodle (7.4%) (Figure 2). On the other hand, the age at which tumors most occurred was between 7 and 15 years in 43%, in the range of 3 to 7 years they occurred in 40% and only 10% were in dogs. 1 to 2 years. Males (51.5%) were more likely to present than females (46.7%).

Regarding the survey carried out, the data obtained regarding the most common breeds in the municipality of Toluca are Creole dogs (37.3%), followed by the chihuahua (6.7%), schnauzer (6.6%) and poodle (4.8%). The most common age of dogs ranges from 1 to 7 years (62.1%), followed by animals under 1 year of age (19.1%). And regarding sex, there was a higher frequency of males (53.3%) than females (46.6%).

## DISCUSSION

The results obtained in this study demonstrate that the frequency of benign tumors in canines is higher than that of malignant tumors, which agrees with various epidemiological studies of oncology in dogs.<sup>2,7</sup>

In relation to the diagnosed tumors, mast

cell tumors and fibromas are tumors that the literature reports as the most common. Studies carried out in Bogotá and Denmark even report that mast cell tumors have a certain predisposition in the Boxer breed and fibromas in Labradors<sup>12,6</sup>, similar to the results obtained (boxers; 5/18 mast cell tumors and in Labradors; 4/18 fibromas). Tumor types are widely related to breed and more tumors have been commonly found in purebred dogs than in crossbreeds.<sup>5,9</sup> In this work, the high frequency of tumors in Labradors coincides with the data reported from the same municipality in 2013, which may be due to the fact that in this town there are a large number of dogs of this breed, since, in a study of racial tumor predisposition, Labradors do not appear among the dogs with the greatest predisposition. Creole dogs were the second most frequent to present tumors, but due to the genetic variability that exists in these canines, there are no reports of predisposition to tumor development, therefore, the high frequency could be related to the fact that, according to the survey carried out a third of the canine population of Toluca are Creole dogs. Regarding breeds, the tumors presented in a very similar way to the data obtained in the survey, except for the Chihuahua breed, which did not have a significant frequency (1.3%). In this study, the frequency of males was higher than that of females, however, Vail et al., 2007, point out that there is no predisposition of skin tumors by sex. However, in Denmark, Switzerland and Mexico, more frequencies of tumors are reported in females,<sup>6,7,10</sup> This trend may be related to the fact that these studies are not specific for skin tumors and therefore, the higher frequency of tumors in females may be influenced by the presence of mammary gland tumors. As in all types of tumors, skin tumors occur mainly in old animals<sup>3,9</sup> and the data obtained in this work agree with what has already been described.

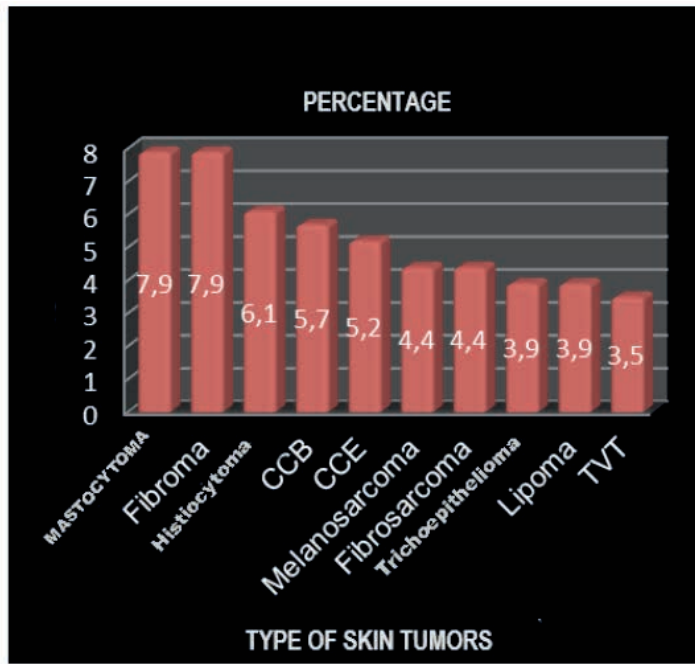


Figure 1. Frequency by type of skin tumors in dogs from the municipality of Toluca.

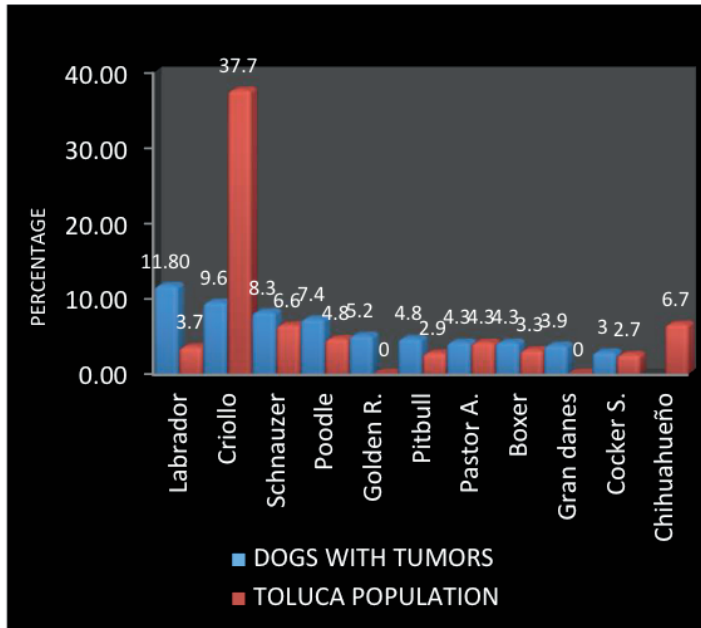


Figure 2. Frequency of skin tumors in dogs by breed/creole and breed/creole of dogs in the population of the municipality of Toluca.

## CONCLUSIONS

The behavior of skin tumors that exist in the municipality of Toluca is similar to that of other countries, however, exploring in greater detail the characteristics of the canine population in this municipality broadens the panorama to be able to refer to the tumor risk factors to which that dogs in this area are exposed to tumorigenesis.

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