SHORT COMMUNICATION

Clinico-Epidemiological Study of Canine Neoplasms

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Abstract

The present study was carried out to know the retrospective clinico-epidemiology of canine neoplasms based on total 9972 canine clinical cases registered at Veterinary Clinical Complex of the College at Junagadh (India) during the three years (April, 2018 to May, 2021). Among them, 2685 (26.92%) cases were of different types of surgical affections, of which 121 (4.50%) animals were confirmed with neoplasms. The clinical epidemiology of 121 registered cases of canine neoplasms revealed higher incidences of tumour in 4-8 years of age group (51.23%), followed by 9 to 12 years (28.09%), while sex-wise occurrence was more in females (61.98%) compared to males. Breed-wise data revealed Labrador retriever (25.61%) followed by German Shepherd (23.14%), Pomeranian (20.66%), and non-descript (18.18%) breeds had higher occurrence of neoplasm than other breeds. Canine mammary gland tumours were most commonly found (28.09%) followed by cutaneous tumour (23.14%), transmissible venereal tumour (21.048%) and others during the study.

Key words: Canine Mammary gland tumour, Canine Neoplasm, Incidence, Tumour.

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Introduction

Cancer is a new growth of cells which proliferate continuously without control, bear a considerable resemblance to healthy cells from which they arise, have no orderly structural arrangement, serves no useful function and have no clearly understood cause (Rao, 2001). Neoplasm is benign when the cell numbers increase in a localised manner, while in malignant neoplasm, abnormal cells invade into neighbouring normal tissue or successfully colonise distant locations in the body by metastasis (Kitchell and Dervisis, 2010). Cancer is one of the leading causes of death in the world and its incidence is still increasing, particularly in developing countries. Tumours can be seen in most of the canine breeds in varying geographical areas covering different age groups (Kashyap *et al*., 2013). The causative agent of tumours in dogs is multifactorial (Roshini *et al*., 2013) which includes the participation of sex hormones, genetic, oncogenic viruses, immunological factors, environmental factors and carcinogens as well. Incidence of tumours originated from the skin and subcutis are highest followed by mammary gland and tumours of genital system. The most common specific tumour types diagnosed are mammary tubulopapillary carcinoma, mast cell tumour and fibrosarcoma (Zuckermann *et al*., 2013). In the present scenario, canine neoplasm is an emerging branch in India and there are very few studies which were conducted on incidence of neoplasms in dogs. So, looking to the facts, this study was designed to know the epidemiological status of tumours in dogs of Suarashtra region in Gujarat.

Materials and Methods

To know the retrospective epidemiological status of canine neoplasms, signalment and clinical details of total 9972 different types of clinical cases of dogs registered at Veterinary Clinical Complex, College of Veterinary Science & A.H., Kamdhenu University, Junagadh (Gujarat, India) during the last three years (April, 2018 to May, 2021) were analyzed. The signalment on neoplasms involved data regarding age (≤ 3, 4-8, 9-12, ≥ 13 yrs), sex and breed, while clinical details were furnished with type of tumor and body part involved in affected dogs during prescribed duration of three years. The number and frequency of neoplasm with respects to these epidemiological factors were calculated.

Results and Discussion

During the three years (April, 2018 to May, 2021), total 9972 cases of dogs were reported at Veterinary Clinical Complex, Veterinary College, Junagadh, in which 2685 (26.92%) cases were affected with different types of surgical disorders.

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Out of these surgical affections, 121 (4.50%) animals were confirmed with canine neoplasms. These findings concurred well with Tank *et al*. (2010), who also reported retrospective surveillance of canine mammary tumours, by scrutinizing 2070 cases of surgical ailments, and found 7.63 % of various neoplastic conditions and amongst them 63 cases (39.87 %) were of mammary gland tumours.

Age-wise Incidence

In the epidemiological study, the highest incidence was recorded in the age group of 4 to 8 years (51.23%), followed by 9 to 12 years (28.09%), less than 3 years (10.74%) and more than 13 years (9.91%) (Table 1). Babu *et al*. (2012) reported higher incidence of canine tumours in the age group of 5 to 8 years, while Chandravathi *et al*. (2014) reported higher incidence of tumours in the age group of 7-9 years (29 cases, 42.65 %) followed by 4-6 years (20 cases, 29.41 %), above 9 years (19 cases, 27.94 %) and below 3 years (1 case, 1.47 %). Hamid *et al*. (2014) observed highest risk of development of various tumours at the age group of 10-12 years, followed by 13-15 years and 7-9 years.

Table 1: Age-wise incidence of canine neoplasm (n=121)

Canine neoplasm	Age groups (Years)			
	≤ 3	4-8	9-12	>13
No. of cases	13	62	34	12
Percentage	10.74	51.23	28.09	9.91

The maximum numbers of cases found in the 4-8 year of age group in this study could be owing to the fact that tumour development and progression take time, and carcinogen exposures should be prolonged for efficient mutagenesis. According to Arya *et al*. (2018), another factor for tumour susceptibility in old age is that ageing tissue is more sensitive to neoplastic transformation than juvenile tissue.

Sex-wise Incidence

The incidence of neoplasms was found higher in females (75/121, 61.98%) as compared to males (46/121, 38.01%) during this study. Similarly, Kumar *et al*. (2020) found that female dogs had the highest prevalence rate of tumours compared with male dogs (55.36 vs. 44.64 %). Roshini *et al*. (2013) found almost equal occurrence of canine tumours in male and female dogs which may be due to higher population of male dogs in particular area. Hormonal interactions, gastrin releasing peptide receptors are more common among female than male canines, which might be the reason for affecting more number of female cases than males.

Breed-wise Incidence

Breed wise distribution showed higher occurrences of neoplasms in Labrador retriever (31/121, 25.61%) followed by German Shepherd (28/121, 23.14%), Pomeranian (25/121, 20.66%), and non-descript (22/121, 18.18%), and least incidence was recorded in Doberman (4/121, 3.30%), Spitz (3/121, 2.47%), Rottweiler (3/55, 2.47%), Great Dane (2/121, 1.65%), Golden Retriever (2/121, 1.65%) and Boxer (1/121, 0.82%) (Table 2). Similarly, Hamid *et al*. (2014) reported higher frequency of neoplasms in Labrador breed (32.72%) followed by Pomeranian (20%), German shepherd (12.72%), Doberman (9.09%) and mongrel (7.07%). Chandravathi *et al*. (2014) recorded breed wise highest incidence of canine neoplasms in Pomeranian (26.50%), followed by non-descriptive (23.52%), German shepherd (23.52%), Labrador (8.82%), Doberman (1.47%), Dachshund and Rottweiler (2.94%) and each one of Collie and Great Dane (1.47 %). Pet owners have distinct choices for particular breeds based on popularity of breed in particular region, which may be the likely reason for the diversity in breed predisposition to canine cancers (Arya *et al*., 2018).

Table 2: Breed-wise Incidence of canine neoplasm (n=121)

Breed	No. of cases	Percentage
Labrador Retriever	31	25.61
German Shepherd	28	23.14
Pomeranian	25	20.66
Non-Descript	22	18.18
Doberman	4	3.30
Spitz	3	2.47
Rottweiler	3	2.47
Great Dane	2	1.65
Golden Retriever	2	1.65
Boxer	1	0.82

Type of Canine Tumours

The highest numbers of canine tumours diagnosed were of canine mammary gland tumours (28.09%) followed by cutaneous tumours (23.14%), transmissible venereal tumours (21.48%), oral tumours (14.04%), warts (5.78%) and ear tumour (2.47%), whereas less incidences were noticed of kidney tumours (1.65%), and testicular tumour, osteoma, tumour in premaxillary sinus and lymphoma (0.82% each) (Table 3). Photographs of some of these tumours are shown in Figure 1 with respect to their common sites.

Table 3: Type of canine tumours (n=121)

Type of tumour	No. of cases	Percentage
Mammary gland tumour	34	28.09
Cutaneous tumour	28	23.14
Transmissible Venereal tumour	26	21.48
Oral tumour	17	14.04
Warts	7	5.78
Ear tumour	3	2.47
Kidney tumour	2	1.65
Testicular tumour	1	0.82
Osteoma	1	0.82
Tumour in premaxillary sinus	1	0.82
Lymphoma	1	0.82

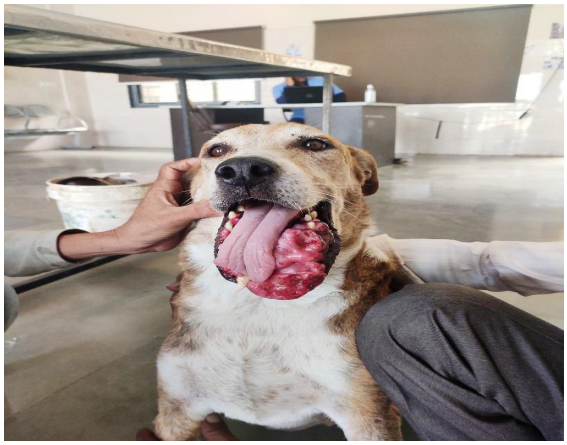
Mammary gland tumour

Tumour at left forelimb

Wart on left lower eyelid

Penile CTVG

Bone tumour



Epulis

Fig. 1: Some classical types of canine neoplasm

Nair *et al*. (2007) found highest incidence of mammary tumours (41.66%) followed by skin tumours (31.25%), vaginal tumours (14.5%), testicular tumours (6.2%). Zuckermann *et al*. (2013) also found higher incidence of skin and subcutis tumours (45.73%) followed by mammary gland tumours (21.75%). Khimta *et al*. (2010) recorded the highest incidence of CTVT (42.93%) followed by mammary gland tumours (33.50%) and skin and other tumours (23.57%).

In the present study, the incidence of mammary gland tumours was higher, which might be due to imbalance between estrogens and progesterone, as described by Benjamin *et al*. (1999) and Vascellari *et al*. (2016). Whereas, Kashyap *et al*. (2013) noted higher incidence of skin tumours and concluded that it might be due to oncogenic virus. However, Gamlen *et al*. (2008) opined that excessive sun exposure to thin hair coat or light hair colour dogs predispose them to cutaneous tumour.

The study concluded that the canines between 4 and 8 years of age group were mostly affected by tumours. Among breeds, Labrador retriever and German shepherd were found more affected followed by Pomeranian and non-descript breed in Junagadh region. Highest incidence reported was of canine mammary gland tumour followed by cutaneous tumour and transmissible venereal tumour in this study.

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