RETROSPECTIVE STUDIES ON TUMOR CONDITIONS IN DOGS OVER A PERIOD OF TEN YEARS (2005-2014)

DEEPIKA LATHER*, R.P. GUPTA and SONU SHARMA
Department of Veterinary Pathology, College of Veterinary Sciences
Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar-125 004, India

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ABSTRACT

The present work was based on retrospective study of 88 biopsies of dogs received over a period of ten years (2005 to 2014). The result revealed that highest number of tumors was epithelial followed by mesenchymal and mixed ones. Sex-wise distribution of tumor cases revealed 47 cases (53.4%) in females and 41 (46.5%) in males. Maximum number of cases were 22 (25%) in the age group of 4-6 years followed by 19 (21.5%) in 8-10 years, 18 (20.4%) in 6-8 years, 17 (19.3%) in 2-4 years, 8 (9%) in 10-12 years and 4 (4.5%) in less than 2 years age group. Anatomical location-wise, the highest number of cases were in mammary gland region i.e. 27 (30.6%) followed by 21 (23.8%) in vaginal/uterine region, 17 (19.3%) in cutaneous/skin surface, 8 (9%) in eye region, 7 (7.9%) in oral/mouth region, 3 (3.4%) each in internal organs/anal region and one each in ear and prostate gland (1.1%). The maximum number of cases were of mammary gland adenoma/adenocarcinoma/carcinosarcomas in 22 (25%) followed by fibroma/fibrosarcoma in 17 (19.3%), transmissible venereal sarcoma in 10 (11.3%), squamous cell carcinoma in 9 (10.2%), myxoma in 6 (6.8%), haemangioma/haemangiopericytoma in 5 (5.6%) and melanoma in 3 (3.4%). Two cases (2.3%) each of papilloma, leiomyoma, basal cell carcinoma, hepatoma and one case (1.1%) each of mastocytoma, rhabdomyoma, ossifying fibroma, lipoma, prostate gland tumor, ameloblastoma, interalveolar carcinoma and seminoma were also observed. The year-wise data analysis of tumor conditions is useful to determine whether the incidence of tumours is on increasing trend.

Key words: Tumors, dogs, retrospective study

For the confirmatory histopathological diagnosis, representative pieces of formalin fixed biopsy tissues with thickness of 2-3 cm have been processed by paraffin embedded technique as per the standard procedure (Luna 1968). The tissue samples were washed in running tap water to remove formalin, processed in ascending grades of alcohol for dehydration and cleared in benzene, infiltrated and embedded in paraffin. The paraffin embedded tissues were cut into 3-4 µ thick section using automated microtome and stained with Hematoxylin and Eosin. Tissues sections wherever required have also been stained with special staining procedures such as Masson’s trichrome stain to differentiate mesenchymal content (fibroma) with mixed epithelial tissue (myoepithelioma) and toluidine blue staining to rule out less differentiated mastocytoma (Luna, 1968).

RESULTS AND DISCUSSION

The result of 88 biopsies revealed that the highest number of neoplasm(s) affecting dogs were of epithelial origin, followed by mesenchymal and mixed tumours. More cases of epithelial neoplasm(s) were related to skin which is exposed to harmful UV radiations responsible for cancer development. Also the epithelial surface(s) are exposed to chemical and metabolic irritants which may act as direct or indirect carcinogens.

MATERIALS AND METHODS

The study was conducted on the biopsy reports of last ten years i.e. from 2005 to 2014 available in the department for evaluating epidemiology of tumour conditions in dogs. Sex, age and anatomical location were recorded from the history of the case(s).

*Corresponding author: deepikalather@yahoo.co.in
Sex-wise distribution of neoplasm(s) revealed 47 cases (53.4%) in females and 41 cases (46.5%) in males. Sex-wise tumor distribution revealed no effect of sex in tumour development. Similar findings were also described by other workers (Dorn et al., 1968; Schafer et al., 1998; Das and Parhi, 2003). However, Vachhani et al. (2004) revealed that the frequency of occurrence of neoplasms in Anand district was more in females (60%) than males (40%).

Age group-wise distribution of tumours is given in Fig. 1. Maximum number of cases was 22 (25%) in the age group of 4-6 years followed by 19 cases (21.5%) in 8-10 years, 18 cases (20.4%) in 6-8 years, 17 cases (19.3%) in 2-4 years, 8 cases (9%) in 10-12 years and 4 cases (4.5%) in less than 2 years’ age group. Maximum number of cases was in the middle age group i.e. from 4-10 years, while few cases were found in less than 2 and more than 10 years of age. Consistent to our findings, Dorn et al. (1968) also reported peak incidence of canine neoplasms between 6-14 years of age. Similar observations were also reported by Das and Parhi (2003) where 7-9 years age group had the highest incidence of neoplasm(s) particularly at 8 years of age and as the age increased, the incidence declined sharply. However, Schafer et al. (1998) reported tumor incidence using Kaplan-Meier survival curve analysis and log-rank analyses and observed that the susceptible family had highest tumor incidence(s) at 13.6 years of age. Few cases in very young dogs as observed in our study is supportive of the fact that the development of neoplastic conditions occur due to exposure of environmental carcinogens which causes mutations and accumulation of such genetic alteration(s) is proportional to increased age.

Anatomical distribution of tumours is illustrated in Fig. 2. The highest number of cases was in mammary gland region (30.6%) followed by vaginal/uterine region (23.8%), cutaneous/ skin surface (19.3%), eye region (9%), oral/mouth region (7.9%), internal organs/anal region (3.4%) and one case each in ear and prostate gland. Similar findings were reported by Vachhani et al. (2004) in which mammary gland, reproductive organ and skin were the most common sites for the neoplasm. However, Mukhopadhayay et al. (1992) and Moulton (1999) reported that mammary tumors were the second
most common group of neoplasms in dogs, following the skin tumors.

Different types of tumors recorded from the year 2005 to 2014 are illustrated in Fig 3. Maximum number was of mammary gland tumors (22; 25%) followed by fibroma/fibrosarcoma (17; 19.3%), transmissible venereal sarcoma (10; 11.3%), squamous cell carcinoma (9; 10.2%), myxoma (6; 6.8%), haemangiomhaemangiopericytoma (5; 5.6%) and melanoma (3; 3.4%). Two cases (2.3%) each of papilloma, leiomyoma, basal cell carcinoma, hepatoma and one case (1.1%) each of mastocytoma, rhabdomyoma, ossifying fibroma, lipoma, prostate gland tumour, ameloblastoma, interalveolar carcinoma and seminoma were also observed. Various types of mammary gland tumours reported were adenoma, adenocarcinoma, mixed mammary gland tumours and myoepithelioma. Similar to our findings Jani et al. (1992) and Pawar (2006) also reported mammary adenocarcinoma as the most frequently observed neoplasm followed by fibroma, transmissible venereal granuloma, basal cell carcinoma and squamous cell carcinoma. Das and Parhi (2003) studied incidence of canine neoplasms in Orissa and reported adenocarcinoma, adenoma and histiocytoma to be the most common types of tumors.

Year-wise incidence of tumors is illustrated in Fig. 4. It is clearly evident from this figure that the incidence of tumours in dogs was almost similar from 2005 to 2013 except in the year 2011 where it declined to four. The year-wise data analysis of tumor conditions is useful to determine whether the incidence of tumours is on increasing trend. The variation in number of cases appears variable due to less or variable reporting by the owners. In Veterinary medicine, the increase in the incidence of neoplastic disease (including mammary tumors) requires continuous development from veterinary oncology specialists. These studies are also useful for establishing risk factors and prognosticating criteria from clinical and histopathological features. Therefore, these may be translated into relevant scientific information that may be used as a basis for experimental studies. Therefore, such studies are of clinical significance to plan further research programme.

REFERENCES


