



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; SP-9(4): 228-231
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www.thepharmajournal.com
Received: 25-02-2020
Accepted: 27-03-2020

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Retrospective studies on canine mammary neoplasm in dogs over a period of four years (2014-2018)

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Abstract

The present work was based on retrospective study of 386 biopsies of dogs received over a period of four years (2014 to 2018) in and around Chennai at Madras Veterinary College, Chennai-600 007, out of which 99 biopsies (25.64%) were reported positive for Canine Mammary Neoplasm. The sex-wise distribution revealed higher incidence in intact bitches 80.2% (77 cases), followed by bitches neutered after 3 years of age 16.7% (16 cases), followed by bitches neutered before 3 years of age 3.1% (3 cases) in total accounting for 96 cases in bitches (96.9%) and in dogs 3 cases were reported (3.1%). Maximum number of cases were 57 cases (57.6%) in the age group of 5-10 years followed by 32 cases (32.3%) in above 10 years and 10 cases (10.1%) in 0-5 years. The incidence of Canine Mammary Neoplasm was highest in Labrador retriever with 32 cases (32.32%), followed by Non-descript Dogs (ND) with 24 cases (24.32%), Spitz with 19 cases (19.19%), Doberman with 12 cases (12.12%) and German Shepherd (GSD) with 5 cases (5.05%), Great Dane with 3 cases (3.03%) followed by Pug, Dachshund and Lhasa Apso 1 case each (1.01%) respectively. The gland-wise occurrence of canine mammary neoplasm was studied in 99 cases in which the incidence of neoplasm in right chain of mammary gland is 45% and in left mammary gland chain is 55%. Out of 96 bitches 57 cases (59.4%) shown single gland involvement, 22 cases (22.9%) shown involvement of 2 glands, 13 cases (13.5%) shown involvement of three glands and 5 cases (5.2%) shown involvement of 4 glands. In dogs all the 3 cases reported have single gland involvement. The most commonly affected pair of gland is inguinal mammary gland (41.7%), followed by caudal abdominal mammary gland (41.1%), caudal thoracic mammary gland (7.9%), cranial abdominal mammary gland (5.2%) and cranial thoracic mammary gland (4.3%) respectively. This study enlightens the sex-wise, breed-wise, age-wise and gland-wise epidemiology of canine mammary neoplasm which helps for a veterinary physician to diagnose and treat canine mammary neoplasm cases effectively.

Keywords: Canine mammary neoplasm, epidemiology, retrospective study

Introduction

In Veterinary medicine, mammary tumors represent the most frequently diagnosed neoplasm in intact female dogs, and 50% of these are malignant^[1]. A study focusing on the incidence of canine mammary tumors found tumors in approximately 0.05% of females that were spayed before their first heat cycle. This figure increased to 8% or 26% when the animals were spayed after their first or second heat, respectively. However, if the animals were spayed later, the risk of developing malignant tumors (MN) was the same as for an intact bitch^[2]. Mammary tumors can vary in size from a few millimeters to over a few centimeters, and at least 50% of the cases present multiple masses mainly located at the caudal glands^[3].

Materials and Methods

The study was conducted on the biopsy reports of last four years i.e. from 2014 to 2018 available in the department for evaluating epidemiology of Mammary Neoplasm in dogs and bitches. Sex, age and anatomical location were recorded from the history of the cases. For the confirmatory histopathological diagnosis, Fine Needle Aspiration Cytology was done. The cellular samples of lesions were obtained through insertion of thin needle (24 G). The aspirated cellular mass is smeared and stained as per standard protocol⁴. The case is diagnosed from which the breed-wise, age-wise, sex-wise and gland-wise data were collected. The collected data were entered into Excel sheets, which were imported and analyzed using Descriptive statistics (frequency and percentage) for all types of cancer separately.

Results

Out of 386 biopsies performed during the time line, 99 biopsies (25.64%) were reported

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positive for Canine Mammary Neoplasm. The sex-wise distribution revealed higher incidence in intact bitches 80.2% (77 cases), followed by bitches neutered after 3 years of age 16.7% (16 cases), followed by bitches neutered before 3 years of age 3.1% (3 cases) in total accounting for 96 cases in bitches (96.9%) and in dogs 3 cases were reported (3.1%). Maximum number of cases were 57 cases (57.6%) in the age group of 5-10 years followed by 32 cases (32.3%) in above 10 years and 10 cases (10.1%) in 0-5 years. The incidence of Canine Mammary Neoplasm was highest in Labrador retriever with 32 cases (32.32%), followed by Non-descript Dogs (ND) with 24 cases (24.32%), Spitz with 19 cases (19.19%), Doberman with 12 cases (12.12%) and German Shepherd (GSD) with 5 cases (5.05%), Great Dane with 3 cases (3.03%) followed by Pug, Dachshund and Lhasa Apso 1

case each (1.01%) respectively. The gland-wise occurrence of canine mammary neoplasm was studied in 99 cases in which the incidence of neoplasm in right chain of mammary gland is 45% and in left mammary gland chain is 55%. Out of 96 bitches 57 cases (59.4%) shown single gland involvement, 22 cases (22.9%) shown involvement of 2 glands, 13 cases (13.5%) shown involvement of three glands and 5 cases (5.2%) shown involvement of 4 glands. In dogs all the 3 cases reported have single gland involvement. The most commonly affected pair of gland is inguinal mammary gland (41.7%), followed by caudal abdominal mammary gland (41.1%), caudal thoracic mammary gland (7.9%), cranial abdominal mammary gland (5.2%) and cranial thoracic mammary gland (4.3%) respectively.

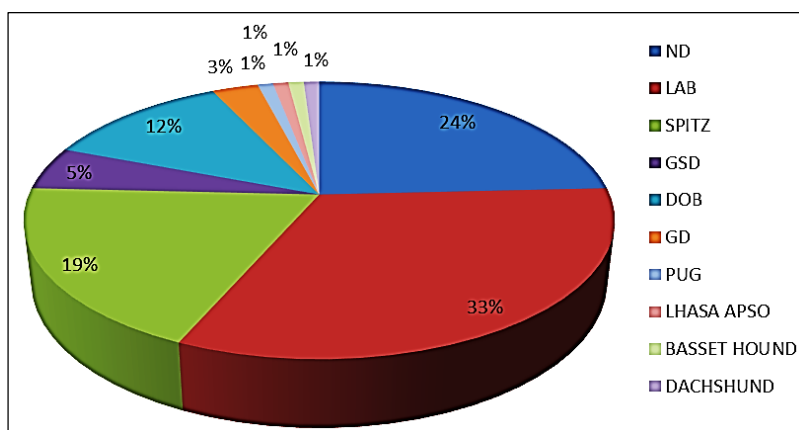


Fig 1: Breed wise incidence of canine mammary neoplasm

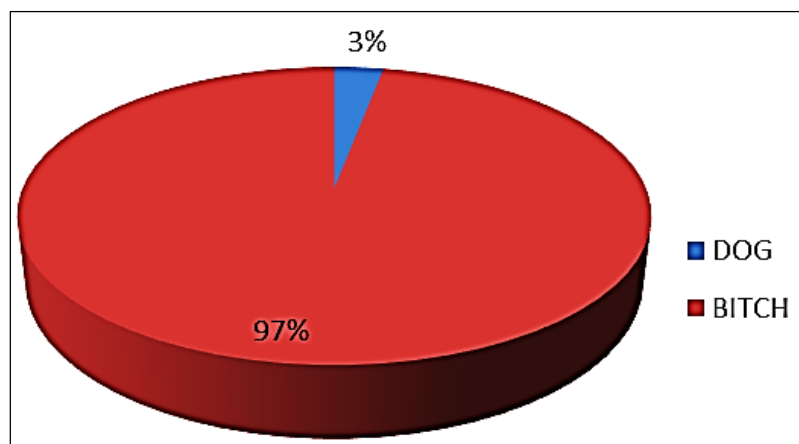


Fig 2: Sex wise incidence of canine mammary neoplasm

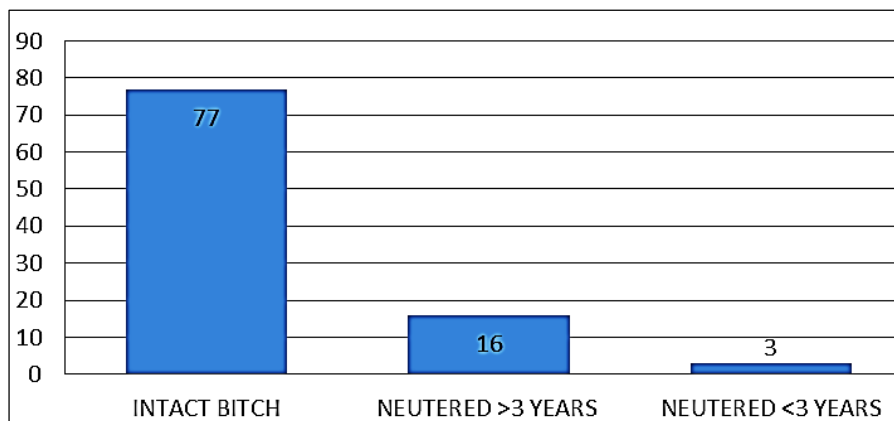


Fig 3: Sexual status wise distribution in females

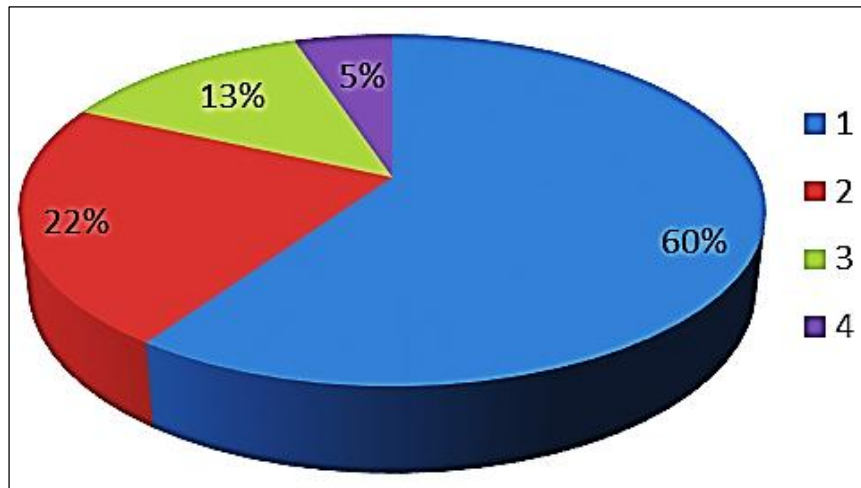


Fig 4: No. of glands affected with canine Mammary Neoplasm

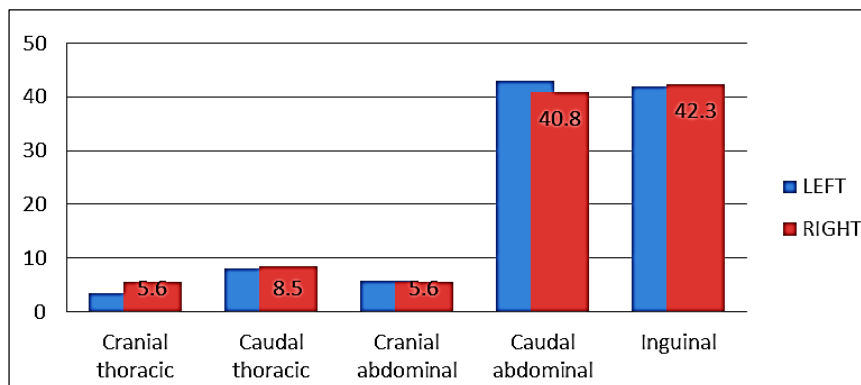


Fig 5: Gland-wise distribution of mammary neoplasm in bitch

Discussions

• Sex-wise Incidence

The sex wise incidence of Canine Mammary Neoplasm is based on the influence of female ovarian hormones especially Estrogen⁵. In dogs there may be rare incidence as stated which accounts for the expression of Estrogen receptors, HER2 and Progesterone receptors^[6, 9].

• Age-wise Incidence

Incidence of Mammary Neoplasm in bitches increase with increase in age due to increase in expression of Estrogen Receptors and Progesterone Receptors with increase in age whereas it decreases after 10 years which accounts to decrease in expression of same receptors^[5].

• Breed-wise Incidence

Incidence of Canine Mammary Neoplasm is due to mis-sense mutations in Single Nucleotide Polymorphisms exons of BRCA2 gene in Canine mainly at the 19th loci. The inheritance of genes in dog is highly based on Cladogram based inheritance (i.e) genes are inherited based on sub groups based on their species and group of origin.

• Gland-wise Incidence

The gland wise incidence and number of glands affected have no impact on the survival of the bitches affected with Canine Mammary Neoplasm^[9].

Conclusion

This study enlightens the sex-wise, breed-wise, age-wise and gland-wise epidemiology of canine mammary neoplasm which helps for a veterinary physician to diagnose and treat canine mammary neoplasm cases effectively. The epidemiological study of Canine Mammary neoplasm very

much helps as bitches act as potential animal model for studying Human Mammary neoplasm than carcinogenic mice and other rodents as they share common genomic and histopathological findings.

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