STUDIES ON EPIDEMIOLOGICAL ASPECTS OF CANINE MAMMARY GLAND TUMOURS IN GUJARAT

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ABSTRACT

Epidemiological factors like age, breed, sex, parity, breeding soundness and site and nature of involvement of mammary gland were studied in relation to occurrence of mammary tumours in 29 bitches over one year at College Hospital. Out of 29 canine mammary tumour cases, 13 (44.83 %) were found in dogs aged 4 to 8 years, 12 (41.38 %) in dogs aged 8 to 12 years and 4 (13.79 %) in dogs aged more than 12 years, but no case was seen in dogs less than 4 years old. Breed wise higher occurrence was found in German Shepherd (36.50 %) and Pomeranian (31.75 %) as compared to the other breeds and that too mainly in females (96.56 %). There was an increasing frequency of canine mammary tumours from cranial thoracic to inguinal pairs with the highest incidence in caudal abdominal (31.03 %) and the least in cranial thoracic pair (3.45 %). The involvement of inguinal, cranial abdominal and caudal thoracic glands was 27.59, 20.69 and 17.24 per cent, respectively. Most of the patients had multiple involvements of glands. Out of the 29 bitches operated for mammary tumours, 22 (75.86 %) were intact and rests 7 (24.14 %) were neutered. All the neutered bitches were spayed after the age of 4 years.

KEY WORDS: Canine, Mammary tumour, Epidemiology, Site, Age, Sex and Breed effect.

INTRODUCTION

As compared to human, neoplasms are more frequent in canines and it is a major cause of mortality. During the last several years canine mammary tumours have raised great interest in human and veterinary surgery. Mammary tumours are most frequently encountered among all neoplasms in canines, which are generally mixed type of tumours either benign or malignant. Incidence of mammary gland tumour in canine is as high as 50 per cent of all neoplasms when compared with breast cancer (27 %) in human beings. Mammary gland tumours can occur any where along the mammary chain in canine and involve one or more glands (Moulton, 1999). Breed predisposition, age, sex and neutering have also been reported to influence the occurrence of mammary tumours in canine (Mulligan, 1975; Boldiszar et al., 1992; Moulton, 1999; Godase, 2001 and Priya et al., 2006). Therefore, the present study was aimed to assess epidemiological factors of canine mammary gland tumours in Gujarat region.

MATERIALS AND METHODS

This study was carried out on canine patients having mammary tumours, which were presented at the Teaching Veterinary Clinical Services Complex (Zaveri Clinics) of the College at Anand (Gujarat) during the year 2008-09 and referred to the Department of Surgery and Radiology for further investigation as well as surgical management. To know the epidemiological status of mammary gland tumours, the particulars regarding breed, age (<4, 4-8, 8-12, and >12 years), sex, site of occurrence (right / left), reproductive status (intact / neutered), pregnancy / whelping anamnesis, mammary gland involved, lymph node involved (right / left- axial or -inguinal) pertaining to each case were recorded and analyzed. The findings are presented in different Tables.

RESULTS AN D DISCUSSION

Age-Wise Incidence

Among the 29 cases of canine mammary tumours registered during the current year, maximum incidence (44.83 %) was observed in the animals of 4 to 8 years age group, followed by that in 8 to 12 years age (41.38 %) and above 12 years age group (13.79 %), and no case was recorded in animals below 4 years of age (Table 1). An increase in the incidence of mammary tumours observed after 4 years of age, so called

onset of "cancer age" in the present study is in accordance with the reports of Mulligan (1975) and Moulton et al. (1970). Many previous authors have also noted higher incidence of mammary gland tumour in bitches aged between 4 and 16 years with a mean age of 9 years. The lower occurrence of mammary tumours observed in dogs <4 years and >12 years of age in the present study is also in accordance with the above reports.

Breed-Wise Incidence

Of the 29 mammary tumour cases operated, 10 cases each (34.48 %) were observed in German Shepherd and Pomeranian breed. Mammary tumours found in other breeds in a decreasing order of incidence were Doberman (13.79 %), Mongrel (10.34 %) and Spitz (6.91 %, Table 2).

Rekha (2007), Priya et al. (2006) and Majumdar and Som (1997) also reported majority of canine mammary tumour cases in German Shepherd. Adak (2005), however, reported the highest incidence in Pomeranian. Moulton et al. (1970) have indicated that canine mammary tumours were common in Dachshund, whereas Zatloukal et al. (2005), Else and Hannant (1979) and Mitchell et al. (1974) reported strikingly high incidence in Poodles. MacVean et al. (1978) reported mammary tumours significantly more frequent in Pointers than Poodles and Boston Terriers. Thilakarajan (1991) reported the highest occurrence of mammary tumours in non-descript dogs (24.8 %) followed by German Shepherd (22 %) in Chennai. Boldizsar et al. (1992) observed

Table 1: Age-wise incidence of canine mammary tumours

Sr. No.	Age Group	Total	
		Number	Per cent
1	0-4 Years	00	00.00
2	4-8 Years	13	44.83
3	8-12 Years	12	41.38
4	>12 years	4	13.79
Total		**29**	**100.00**

Table 2: Breed-wise incidence of canine mammary tumours

Sr. No.	Breed	Total	
		Number	Per cent
1	German Shepherd	10	34.48
2	Pomeranian	10	34.48
3	Doberman	4	13.79
4	Mongrel	3	10.34
5	Spitz	2	6.91
Total		**29**	**100.00**

strikingly high ratio in Palis (Hungarian breed) among dogs affected with mammary tumours suggesting a breed predisposition. Mahopatra et al. (2005) reported that among the different breeds of dogs Tibetan breed was found to be the most susceptible followed by crossbreds, German Shepherd, Spitz, non-descript, Labrador and Doberman.

Based on the observations of the present study and those of earlier workers it could be inferred that pet owners have specific choice for a particular breed depending on popularity of that breed in that region, hence their number in different geographical area vary reflecting the breed variation in the incidence of different disorders including mammary tumours.

Sex-Wise Incidence

In the present investigation, 28 cases (96.56 %) of canine mammary tumours were recorded in female dogs, and only one case in male dog. Rutteman et al. (2000), Priester (1979), Mulligan (1975) and Mitchell et al. (1974) also recorded rare occurrence of mammary tumours in male dogs. Rekha (2007) and Dhaygude (2006) reported all the cases of mammary tumours in bitches only. Priya et al. (2006), Thilakarajan (1991) and Brodey et al. (1983) also observed higher incidence of canine mammary tumours in female dogs as compared to male dogs.

The high incidence of mammary tumours observed in females as compared to male dogs can be attributed to endocrinological and functional differences in the either sexes, apart from repeated hypertrophy-atrophy and trauma of mammary tissue in females due to lactation and suckling following each whelping.

Site of Occurrence

In all 51 tumour masses were observed among 29 cases of canine mammary tumours. Most of the canine patients had a multiple tumour masses at different sites of mammary gland. It was noticed that there was an increasing frequency of canine mammary tumours from cranial thoracic to inguinal pairs with the highest incidence of 43.14 per cent in caudal abdominal glands and the least in cranial thoracic pair (1.96 %). The involvement of other glands in decreasing order was from inguinal (24.49 %), cranial abdominal (21.57 %) and caudal thoracic glands (7.84 %). The two caudal most pairs of glands (caudal abdominal and inguinal) accounted for a 67.63 per cent of the incidence (Table 3). In majority of animals right side was affected more compared to left. In both thoracic and abdominal glands caudal glands were most affected compared to cranial glands.

These findings corroborated well with the observations of Rekha (2007), Dhaygude (2006), Moulton (1999), Else and Hannant (1979), Mulligan (1975) and Moulton et al. (1970) who all noticed increasing frequency of canine mammary tumours from anterior to posterior pairs with more than 50 per cent incidence in the caudal abdominal and inguinal glands. Dhaygude (2006) found more involvement of right side mammary glands as compared to left side. Godase (2001) and Mitchell et al. (1974) reported higher incidence of canine mammary tumours in inguinal glands with equal frequency on both the sides (right and left).

Based on the observations of the present study, it could be opined that canine mammary tumours occur with increasing frequency from the most cranial to most caudal mammary glands with more than 65 per cent incidence in caudal abdominal and inguinal pairs. It could be due to the fact that these are the largest glands containing more mammary tissue and these may be subjected to a greater range of physiological changes, predisposing them to neoplasms.

Reproductive Status

Out of the 29 bitches with mammary tumours examined, 22 (75.86 %) were intact and rests 7 (24.14 %) were neutered. Majority of bitches were intact in all the breeds (Table 4). All the neutered bitches were spayed after the age of 4 years. In German Shepherd and Pomeranian, most of the bitches diagnosed for mammary tumour were intact. Rekha (2007), Dhaygude (2006), Adak (2005), Godase (2001), Priester (1979), Else and Hannant (1979) and Mac Vean et al. (1978) also reported greater incidence of mammary tumours among intact compared to spayed bitches. Wey et al. (1999) stated that the ratio of intact to spayed bitches with mammary tumours was 2.5:1. However, in contrary to the present finding, Frye et al. (1967) reported higher

Table 3: Site distribution of canine mammary tumours in different breeds of dogs

Sr No	Breeds	Cranial thoracic		Caudal thoracic		Cranial abdominal		Caudal abdominal		Inguinal	
		Rt*	Lt*	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt
1.	German Shepherd	-	-	2	-	4	2	5	3	1	2
2.	Pomeranian	-	-	-	-	2	1	3	3	-	2
3.	Mongrel	-	-	1	-	-	-	1	2	-	1
4.	Doberman	-	1	-	1	-	-	2	1	1	-
5.	Labrador	-	-	-	-	1	-	-	-	-	-
6.	Cocker Spaniel	-	-	-	-	1	-	1	-	-	-
7.	Great Dane	-	-	-	-	-	-	-	1	-	1
8.	Spitz	-	-	-	-	-	-	-	-	2	2
		-	**1**	**3**	**1**	**8**	**3**	**12**	**10**	**4**	**9**
Overall, 51		**1**		**4**		**11**		**22**		**13**	
Percentage		**1.96**		**7.84**		**21.57**		**43.14**		**24.49**	

* Rt=Right * Lt=Left

Table 4: Reproductive status of different breeds of dogs with mammary tumours

Sr. No.	Breed	Reproductive status	
		Intact	Neutered
1.	German Shepherd	8	2
2.	Pomeranian	7	3
3.	Mongrel	2	1
4.	Doberman	3	1
5.	Spitz	2	0
Total (29)		**22**	**7**
Percentage		**75.86**	**24.14**

incidence of mammary tumours in neutered bitches, and found significant reduction in the risk of mammary tumours in dogs spayed at or before 2.5 years of age. Sorenmo et al. (2000) supported the hypothesis that ovariectomy has a sparing effect on tumour formation especially when performed prior to the first oestrous cycle. Yamagami et al. (1996) reported that ovariectomy had no effect on prognosis of canine mammary tumours. Donnay et al. (1995) found the influence of estrogen in canine mammary tumour development.

Thus, it could be inferred that intact bitches have greater risk for occurrence of mammary tumours as compared to spayed ones. This could be due to hormone dependency of proliferating neoplastic cells. This is further supported by the observation of temporary regression of already existing mammary tumours after spaying.

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