

# OCCURRENCE OF CERTAIN SYSTEMIC DISEASES IN GERIATRIC DOGS

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A retrospective study to investigate certain systemic diseases in geriatric dogs was conducted in 172 geriatric dogs including 10 apparently healthy dogs. Out of 172 geriatric dogs screened, 39 dogs were diagnosed with acquired heart diseases (24.68 per cent), 34 dogs with genital diseases (21.51 per cent), 19 dogs with urinary system diseases (12.02 per cent) and 18 dogs with respiratory diseases (11.39 per cent). The other conditions recorded in the present study include diseases of eye and ear in 26 dogs (16.45 per cent) and periodontal diseases in 22 dogs (13.92 per cent). Out of the five acquired heart diseases diagnosed in this study, mitral valve insufficiency was most common. In reproductive system diseases pyometra and prostatomegaly were diagnosed. In renal system diseases chronic kidney disease was most common. In respiratory system affections, tracheobronchitis was common. Affected breeds in the study included, Pomeranian (n=83), Labrador Retriever (n=31), German Shepherd (n=24), Dachshund (n=8), Mongrel (n=8) and Golden Retriever (n=4).

**Keywords:** Breeds, Geriatric, Systemic diseases.

Aging is defined as a 'Complex biological process resulting in the progressive reduction of an individual's ability to maintain homeostasis under internal physiological and external environmental stress, thereby decreasing the individual's viability and increasing vulnerability to disease (Boari and Aste,2003). In the broadest sense, aging refers to the natural, progressive series of life changes beginning with conception and continuing through development, maturation and senescence. These changes ultimately lead to decreased vitality, increased vulnerability to disease and eventually death. Generally, aging results in or occurs simultaneously with the loss of organ reserve, regenerative patterns of organ function adaptability.

Aging is a biological process rather than a disease per se, which affects many body systems and increases susceptibility to the disease. Animals can be considered geriatric when they are in the last 25 per cent of their predicted life span (Goldston & Hoskins, 1995). Aging is associated with a reduction in immune response, a decline in cognitive functional reserve of the cardiovascular, pulmonary and renal systems among others. Older animals are at increased risk for

diseases such as diabetes, mitral valve disease, thyroid dysfunctions, osteoarthritis, periodontal diseases and behavior problem. Other diseases include cancer, genital diseases, cataracts, epilepsy, gastrointestinal diseases, obesity, anemia, liver diseases and bladder stones etc. There is a growing interest in health and wellness of elderly dogs. Older pets represent 30-40% of patients in general practice and its proportion is likely to increase in the future as dogs live longer.

## Materials and Methods

The geriatric dogs presented with clinical signs of systemic diseases were screened. Out of 162 dogs screened, 158 dogs were diagnosed with certain systemic diseases which are included in the present study. The study consisted of apparently healthy geriatric dogs and clinical cases with certain systemic diseases. 10 apparently healthy geriatric dogs brought for routine general checkup and vaccination were selected as control groups for comparison and to evaluate various parameters under study. The parameters under study were history and clinical signs, physical examination findings, hematology (Haemoglobin (Hb) Packed cell volume (PCV), Total erythrocyte count (TEC), Total leukocyte count (TLC), Differential leukocyte count (DLC) , Serum Biochemistry (Total protein,

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Albumin, Alanine aminotransferase (ALT), Alkaline phosphatase (ALP), Total bilirubin, Serum glucose, Blood urea nitrogen (BUN), Serum creatinine, Serum sodium, Serum potassium). Systemic blood pressure, thoracic radiography, Electrocardiography and Echocardiography were performed in dogs suspected for acquired heart diseases. Abdominal radiography and abdominal ultrasonography were performed in dogs suspected for reproductive system diseases and urinary system diseases. Thoracic radiography was performed in dogs suspected for respiratory system diseases.

### Results and Discussion

Out of 172 geriatric dogs screened, 39 dogs were diagnosed with acquired heart diseases (24.68 per cent), 34 dogs with genital diseases (21.51 per cent), 19 dogs with urinary system diseases (12.02 per cent) and 18 dogs with respiratory diseases (11.39 per cent). The other conditions recorded in the present study include diseases of eye and ear in 26 dogs (16.45 per cent) and periodontal diseases in 22 dogs (13.92 per cent).

Five types of acquired heart diseases were diagnosed in the study. Acquired heart diseases diagnosed in the study were mitral valve insufficiency in 17 dogs (43.58%), dilated cardiomyopathy in 7 dogs (17.94%), tricuspid valve insufficiency in 8 dogs (20.51%), pericardial effusion in 4 dogs (10.5%), and hypertrophic cardiomyopathy in 3 dogs (7.6%). Mitral valve insufficiency was the predominant one with 43.58 per cent as also reported by Whitney (1974) and Hamlin (2005).

Two types of genital diseases diagnosed in the present study were pyometra in 21 dogs (61.76 per cent) and prostatomegaly in 13 dogs (38.23 per cent).

Three types of urinary system diseases were diagnosed in the study. Urinary diseases diagnosed in the study were chronic kidney disease in 12 dogs (63.15 per cent), urolithiasis in 4 dogs (21.05 per cent) and cystitis in 3 dogs (15.78 per cent).

Four types of respiratory diseases diagnosed in the study. These four diseases include tracheo-bronchitis in 9 dogs (50 per

cent), pulmonary edema in 4 dogs (22.22 per cent), tracheal collapse in 3 dogs (16.66 per cent) and pleurisy in 2 dogs (11.11 per cent). There is an increased occurrence of respiratory diseases in old pets due to reduced immunity background, higher exposure to respiratory pathogens etc. as also recorded by Rozanski, 2013.

### Breed

Affected breeds in the study included, Pomeranian (n=83), Labrador Retriever (n=31), German Shepherd (n=24), Dachshund (n=8), Mongrel (n=8) and Golden Retriever (n=4).

Out of 39 dogs with acquired heart diseases, 15 were Pomeranian, 14 were Labrador Retriever, 4 were German Shepherd, 3 were Dachshund, 2 were mongrel and 1 was Golden retriever. Of the 17 dogs with mitral valve insufficiency 12 were Pomeranian (70.58 per cent), 2 were German Shepherd (11.76 per cent), 2 were Dachshund (11.76 per cent), 1 was Labrador Retriever (5.88 per cent). In dogs with mitral valve disease 70.58 per cent of the affected dogs were small breed dogs like Pomeranian and Dachshund. This finding was in agreement with findings of Hamlin (2005), Borgarelli and Haggstorm (2010). Of the 7 dogs with dilated cardiomyopathy 7 were Labrador Retriever (100 percent) as also recorded by Martin 2009. Of the 8 dogs with tricuspid valve insufficiency, 2 were Labrador Retriever (50 per cent), 1 was German Shepherd (25) and 1 was Mongrel (25). Of the 3 dogs with hypertrophic cardiomyopathy 1 was Labrador Retriever (33.33 per cent), 1 was German Shepherd (33.33 per cent) and 1 was Golden Retriever (33.33 per cent). In the present study large breed were affected with pericardial effusion. This findings were in agreement with Campbell, 2006; Kristin *et al.* (2009) and Tapin (2010) reports. The hypertrophic cardiomyopathy was observed in German shepherd, Labrador retriever and Golden retriever breeds. These findings in breed wise occurrence was in accordance with findings of Sisson and Thomas (1995).

Out of 34 dogs with genital diseases 18 were Pomeranian, 5 were Labrador

Retriever, 6 were German Shepherd, 2 were Dachshund and mongrel each and 1 was Golden Retriever. Of the 34 dogs with pyometra 14 were Pomeranian (66.66 per cent), 3 Labrador Retriever (14.28 per cent), 2 were Mongrel (9.52 per cent), 1 was Dachshund (4.76 per cent) and 1 was Golden Retriever (4.76 per cent). Of the 13 dogs with prostatomegaly, 4 were Pomeranian (30.76 per cent), 2 were Labrador retriever (15.38 per cent), 6 German shepherd (46.15 per cent) and 1 was Dachshund (7.69 per cent). An age related increase in the incidence of BPH was observed in all of the dogs 6 years old and older as also reported by Lowseth *et al.* (1990) and Smith (2008). Enlarged prostate can produce disease by inducing either urinary or colon obstruction due to pressure from enlarged gland. In breed wise occurrence Pomeranians were more commonly affected by genital diseases.

Out of 19 dogs with urinary system diseases 8 were Pomeranian, 2 were Labrador Retriever, 7 were German Shepherd, 1 was Dachshund and Mongrel each. Of the 12 chronic kidney diseases 8 were Pomeranian (66.66 per cent), 2 were Labrador Retriever (16.66 per cent), 1 was German Shepherd (8.33 per cent) and 1 was Mongrel (8.33 per cent). Of the 4 cases of urolithiasis, 1 each were Pomeranian and Golden retriever (25 per cent) and 2 were German shepherd (50 per cent). The high occurrence in Pomeranian could be attributed to the relatively high number of the breed in the present study. The present findings are in agreement with those of previous studies (Muralikrishna, 2003; Adams, 2004 and Kandula and Satishkumar, 2014).

In respiratory diseases 11 were Pomeranian, 5 were Labrador retriever, 1 was Golden retriever and Mongrel each. Of the 9 dogs with tracheobronchitis, 5 were Pomeranian (55.55 per cent), 2 were Labrador Retriever (22.22 per cent), 1 was Golden Retriever (11.11 per cent) and 1 was Mongrel (11.11 per cent). Out of 4 pulmonary edema, 1 each were Pomeranian and German shepherd (25 per cent), and 2 were Labrador retriever were 2. Of the 3 tracheal collapse 2 were Labrador retriever (66.66 per cent) and 1 was Golden

retriever (33.33 per cent). Out of 2 cases of pleurisy 1 each were Golden retriever and Labrador retriever (50 per cent). Other conditions recorded in the present study were 26 eye and ear affections, out of this 18 were Pomeranian, 3 were Labrador Retriever 2 were Dachshund and Mongrel each and 1 was German Shepherd and 22 periodontal diseases out of this 13 were Pomeranian, 2 were Labrador Retriever, 6 were German Shepherd and 1 was Golden Retriever. The breed wise occurrence finding in the present study for tracheal collapse is not similar to the finding of Johnson (2000) who stated that small breeds of dogs were commonly affected.

### Gender

In the present study 87 were male dogs and 71 were female dogs. Male dogs dominated female dogs in incidence of acquired heart diseases with 66.66 per cent (26/39) and 33.33 per cent (13/39) respectively. In the occurrence of genital diseases 61.76 per cent (21/34) were female dogs and 38.23 (13/34) were male dogs. In case of urinary system diseases male dogs showed a dominance with 68.42 per cent (13/19) compared to female dogs which were 31.57 per cent (6/19). In respiratory system diseases male dogs showed dominance with 61.11 percent (11/18) compared to female dogs with 38.38 per cent (7/18). Male dogs dominated female dogs in incidence of diseases of eye and ear with 61.53 per cent (16/26) and 38.46 per cent (10/26) respectively. In the incidence of periodontal diseases female dogs dominated male dogs with 63.63 per cent (14/22) and 36.36 per cent (8/22) respectively.

In acquired heart diseases mitral valve insufficiency was most commonly observed in male dogs with 70.58 per cent (12/17) while female dogs had incidence of 29.41 per cent (5/17). Dilated cardiomyopathy was most commonly observed in male dogs with 71.42 per cent (5/7) while female dogs had an incidence of 28.57 per cent (2/7) so male predominance is more. Vleet *et al* (1981) also reported similar finding. Tricuspid valve insufficiency was most commonly observed

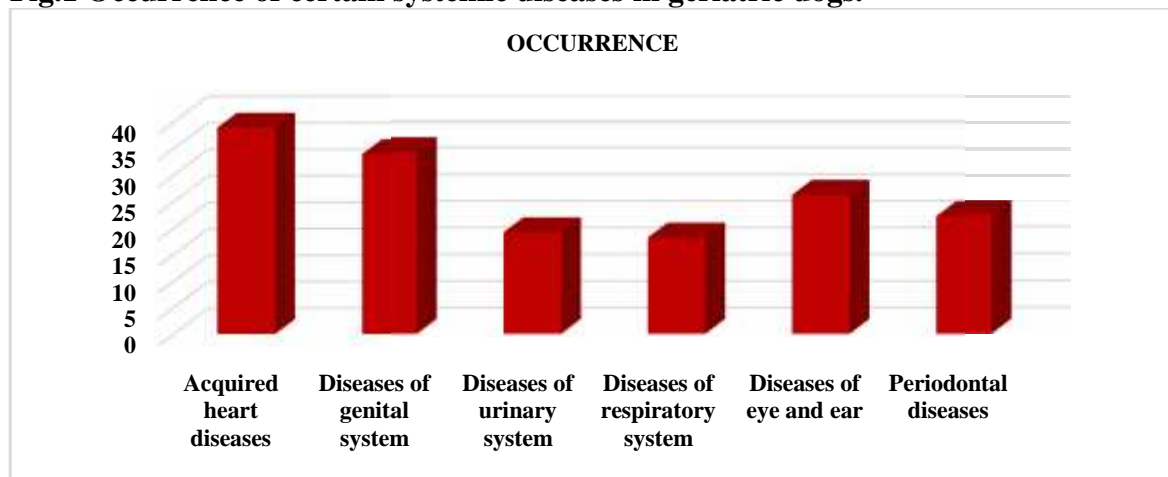
in male dogs with 62.5 per cent (5/8) while female dogs had incidence of 37.5 per cent (3/8). Pericardial effusion incidence was commonly diagnosed in male dogs with 75 per cent (3/4) compared to female dogs with 25 per cent (1/4). Hypertrophic cardiomyopathy was observed more in females with 66.66 per cent (2/3) while male dogs with 33.33 per cent (1/3).

In urinary system diseases, chronic kidney disease was most commonly encountered in male dogs with 66.66 per cent (8/12) while in female dogs with 33.33 per cent (4/12). Urolithiasis was most commonly observed in male dogs with 75 per cent (3/4) while females with 25 per cent (1/4), which was concurred with earlier studies (Muralikrishna, 2003 and Lees *et al.*, 2008).

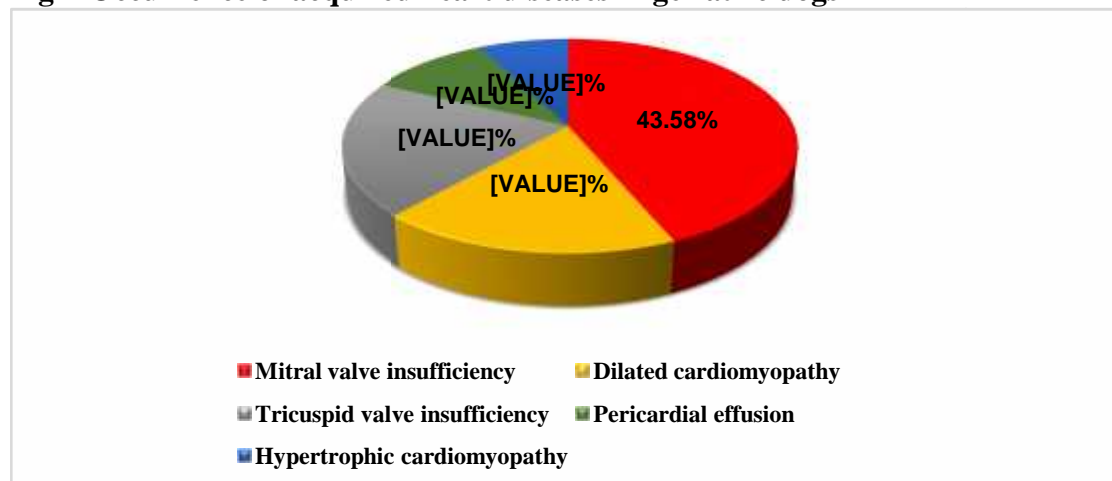
The condition is more common in males due to the larger urethral course exposed to liths as also reported by Pugliese *et al.*, 2005. Cystitis was commonly diagnosed in female dogs with 66.66 per cent (2/3) compared to male dogs with 33.33 per cent (1/3).

In respiratory diseases, for trachea-bronchitis male dogs had an incidence of 55.55 per cent (5/9) and female dogs with 44.44 per cent (4/9). Pulmonary edema was most commonly observed in female dogs with 75 per cent (3/4) and male dogs with 25 per cent (1/4). Tracheal collapse was observed in male dogs with 66.66 per cent (2/3) and female dogs with 33.33 per cent (1/3). Pleurisy was observed only in male dogs (2/2).

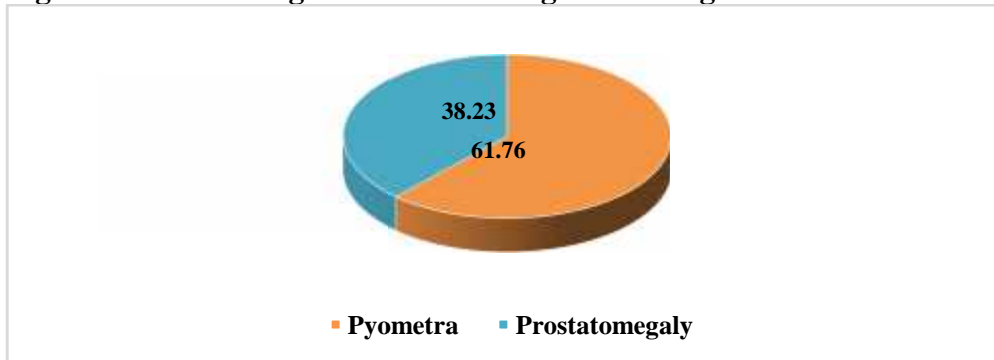
**Fig.1 Occurrence of certain systemic diseases in geriatric dogs.**



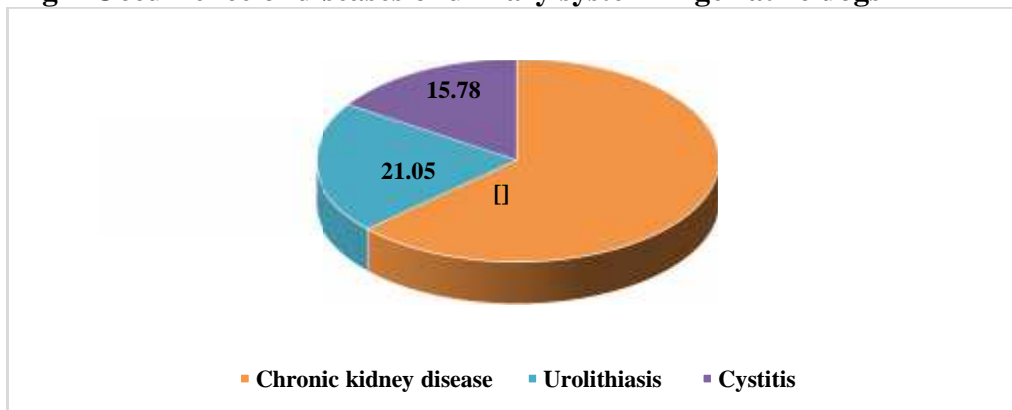
**Fig-2 Occurrence of acquired heart diseases in geriatric dogs**



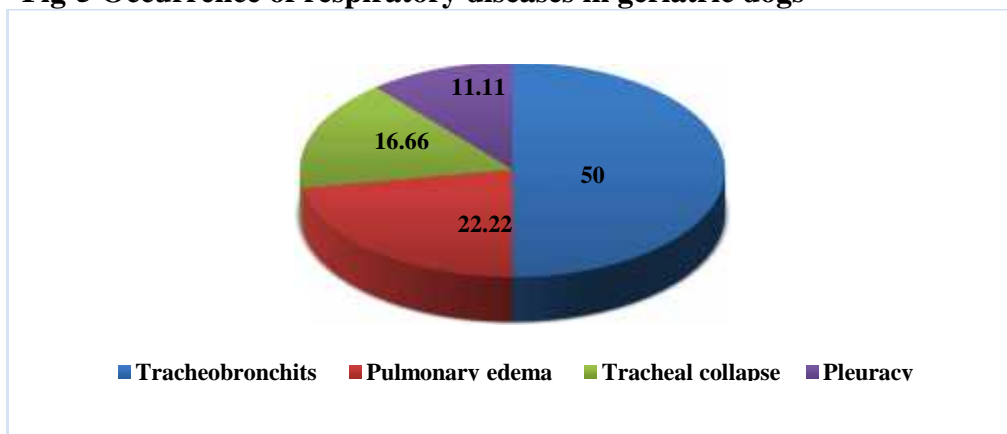
**Fig-3 Occurrence of genital diseases in geriatric dogs**



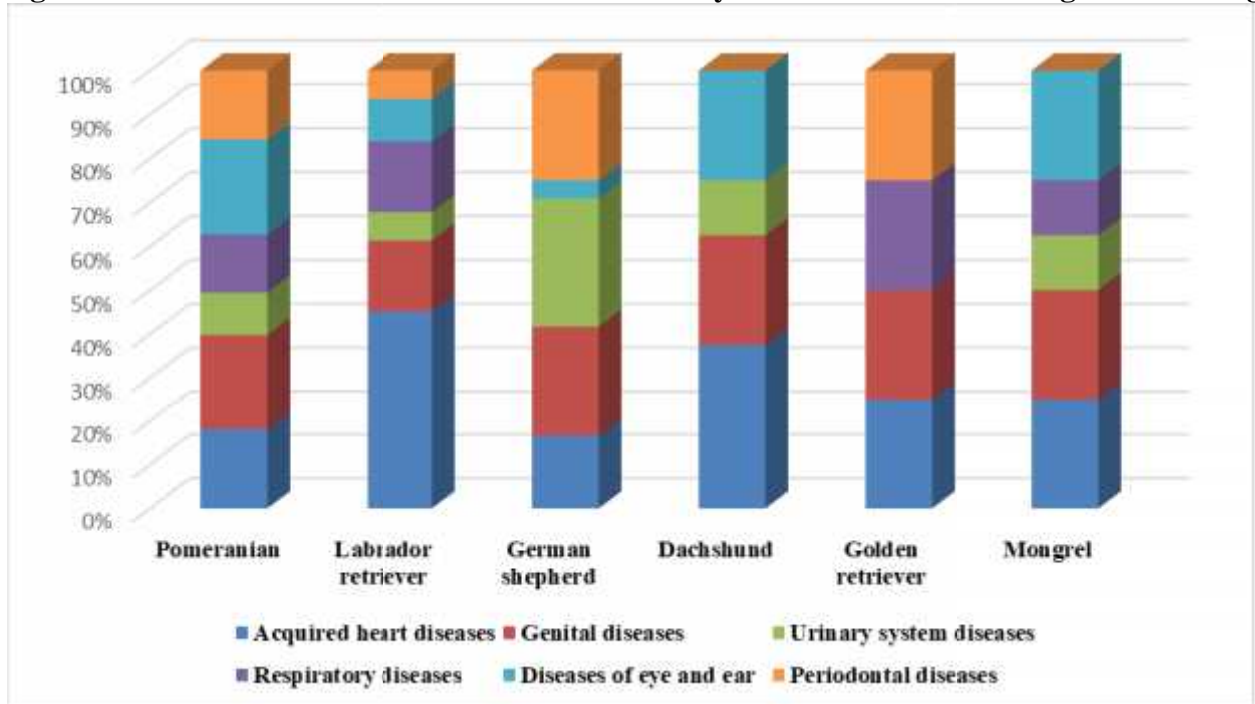
**Fig-4 Occurrence of diseases of urinary system in geriatric dogs**



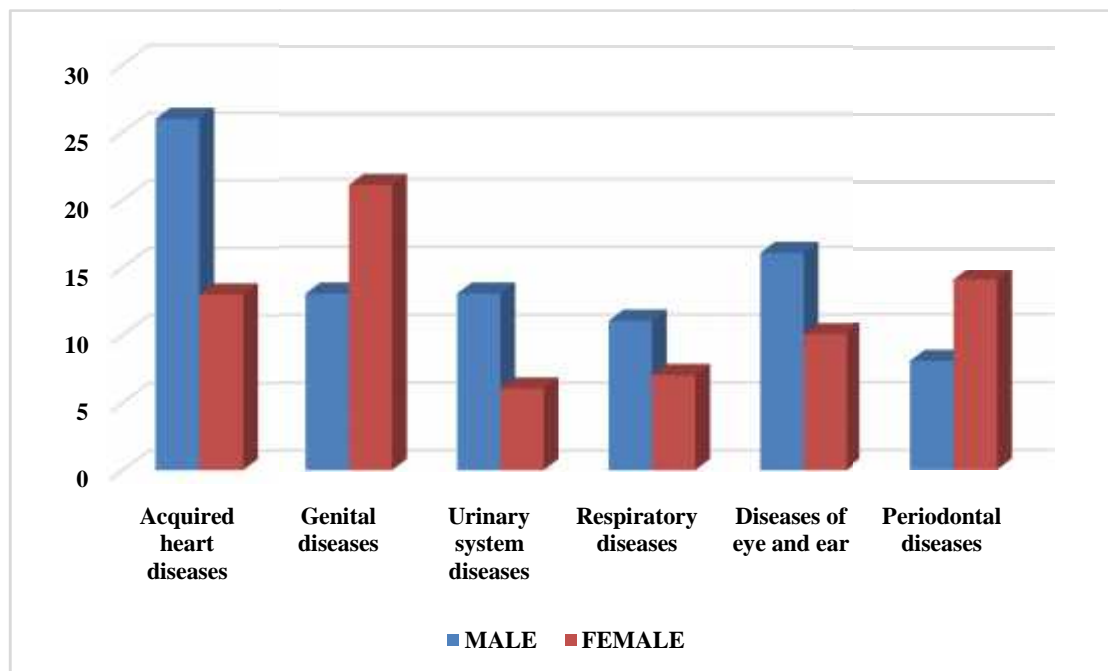
**Fig-5 Occurrence of respiratory diseases in geriatric dogs**



**Fig-6 Breed wise occurrence of certain systemic diseases in geriatric dogs.**



**Fig-7 Gender wise occurrence of certain systemic diseases in geriatric dogs**



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