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Incidence studies on canine forelimb lameness

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Abstract

A prospective study was conducted to determine the incidence forelimb lameness in dogs presented to the Department of Veterinary Surgery and Radiology and Veterinary Clinical Complex, NTR College of Veterinary Science, Gannavaram, Andhra Pradesh. A total of 3003 dogs were presented with surgical problems, out of which 376 cases were diagnosed with forelimb lameness with 12.5% incidence. Radius and ulna fracture (n=93; 24.7%) was the major etiological factor for lameness followed by sprain (n= 61; 16.2%); fracture of humerus (n= 51; 13.5%). Young dogs between 0-2 years were frequently affected and males (n=225; 59.8%) outnumbered females (n=151; 40.1%). Among the various breeds presented with forelimb lameness, Spitz was the most commonly affected breed followed by Pomeranian, Non-descript, Labrador and others.

Keywords: Canine forelimb lameness, radius, forelimb lameness

Introduction

Lameness in animals is characterized by an abnormal stance or gait resulting from a dysfunction within the locomotor system, which could be attributed to either a structural or functional disorder (Whitton, 2010) [19]. Approximately 25 percent of the canine lameness cases were related to musculoskeletal disorders in the forelimb (Scott and Witte, 2011) [16]. This condition could arise from multiple causes including musculoskeletal (fractures, dislocations, dysplasia, sprain, strain, etc.), neurological (paralysis, neuropathies, disc disorders, etc.) or soft tissue affections (wounds, severe injuries, burns, etc.) (Cook, 1997) [5]. Conducting an incidence study is crucial for clinical professionals to enhance the diagnosis and comprehension of various conditions and this approach is essential for determining the prevalence of the most common diseases in a particular geographic region (Chaves *et al.*, 2014) [4].

Material and Methods

The incidence of forelimb lameness in dogs was evaluated for a period of 12 months (from November, 2022 to October, 2023) among the dogs presented to Department of Veterinary Surgery and Radiology, NTR College of Veterinary Science, Gannavaram, Andhra Pradesh. The dogs presented with forelimb lameness were subjected to detailed general orthopaedic examination to detect the aetiology. Detailed anamnesis was collected to record age, breed, and sex wise incidence.

Results and Discussion

A total of 3003 dogs with various surgical problems were presented to the Department of Veterinary Surgery and Radiology and Veterinary Clinical Complex, NTR College of Veterinary Science, Gannavaram, Andhra Pradesh. Among which 376 (12.5%) cases of canine forelimb lameness were documented. Dogs suffered from various affections that resulted in lameness including fractures (Cook *et al.*, 1997) [5], angular limb deformities (Balfour *et al.*, 2000) [2], elbow dysplasia (Remy *et al.*, 2004) [14], neoplasm (Forterre *et al.*, 2007) [7], osteoarthritis and trauma (O Neil *et al.*, 2020) [20], etc.

In the present study, major etiological factor that resulted in forelimb lameness was radius and ulna fracture (n=93; 24.7%) followed by sprain (n= 61; 16.2%); humerus fracture (n= 51; 13.5%); over grown nails (n= 40; 10.6%); wounds (n=33; 8.77%); elbow arthrosis (n= 25; 6.64%); angular limb deformities (n= 18; 4.78%); metacarpal fractures (n= 12; 3.19%); phalangeal fractures (n=11; 2.92%); degenerative joint disease of shoulder joint (n=10;2.65%); carpal fractures(n=10;2.65%); elbow dislocation (n=4; 1.06%); elbow neoplasms (n=4; 1.06%) and scapular fractures (n=4; 1.06%).

Higher incidence of radius and ulna and humerus fractures was in accordance with the findings of Ali (2013) [1], Rhangani (2014) [15], Sran *et al.* (2016) [18], Jain *et al.* (2018) [9] and Bidari *et al.* (2023) [3]. Radius and ulna was one of the important long bones in bearing weight of the animal and hence, frequently affected with various musculoskeletal disorders. Scapular fracture was the least cause of lameness (1.06%) which was also observed from results of Cook *et al.* (1997) [5], who recorded it as 0.5% to 2.4%. It was might be due to comparative less weight bearing and presence of only musculo-tendinous attachments at the proximal extremity of scapula.

Table 1: Etiology of forelimb lameness in dogs

S. No.	Etiology	No. of animals	Percentage
1	Scapular fractures	4	1.06%
2	DJD of shoulder joint	10	2.65%
3	Humerus fracture	51	13.5%
4	Elbow arthrosis	25	6.64%
5	Elbow dislocation	4	1.06%
6	Neoplasm	4	1.06%
7	Radius and ulna fracture	93	24.7%
8	Carpal fracture	10	2.65%
9	Angular limb deformities	18	4.78%
10	Metacarpal fractures	12	3.19%
11	Phalangeal fractures	11	2.92%
12	Overgrown nails	40	10.6%
13	Sprain	61	16.2%
14	Wounds	33	8.77%
	Total	376	

The incidence of forelimb lameness was found to be highest in dogs of 0-2 years age group (n=125; 33.2%) followed by dogs aged between 2-4 years (n=92; 24.4%), 4-6 years (n=52; 13.8%), more than 8 years (n=52; 13.8%) and 6-8 years (n=50; 14.6%). Libardoni *et al.* (2016) [12] also reported the highest incidence of lameness most commonly in young dogs, with an incidence of 42%. In the present study, the lower incidence was observed in dogs older than four years, which was in agreement with the findings of Sran *et al.* (2016) [18] and Bidari *et al.* (2023) [3]. The playful and wandering nature of the young dogs accompanied by increased vehicular traffic, developmental or growth abnormalities, trauma and over activeness might be attributes for higher incidence of forelimb affections in dogs.

Table 2: Age – wise incidence of forelimb lameness

S. No	Age (years)	No. of animals	Percentage
1	0-2	125	33.2%
2	2-4	92	24.4%
3	4-6	52	13.8%
4	6-8	50	14.6%
5	>8	52	13.8%

Incidence of forelimb lameness was more in males (n=225; 59.8%) compared to females (n=151; 40.1%). This finding was similar to the studies conducted by Fitzpatrick *et al.* (2009) [6], Kushwaha *et al.* (2012) [11], Minar (2013) [13], Gluding *et al.* (2022) [8]. Komsta *et al.* (2008) [10] ascribed the highest incidence of forelimb affections in males due to quicker body weight gain resulting in a more rapid progression of degenerative alterations. On the other hand, Simon *et al.* (2011) [17] mentioned aggressiveness, attitude and wandering behaviour in male dogs, made them more vulnerable to accidents and fractures.

Table 3: Sex-wise incidence of forelimb lameness

Sex	No. of animals	Percentage
Male	228	60.6%
Female	148	39.3%
Total	376	

The incidence of forelimb lameness was highest in Spitz (n=76; 20.2%) followed by Pomeranian (n=73; 19.4%); Non descript (n=58; 15.4%); Labrador (n=45; 11.9%); German shepherd (n=36; 9.5%); Rottweiler (n=26; 6.91%); Shih Tzu (n=22; 5.85%); Daschund (n=17; 4.52%); Great Dane (n=12; 3.19%); and Pug (n=11; 2.92%). In the present study, among various breeds, highest incidence of forelimb lameness was recorded in Spitz (n=76; 20.2%) followed by Pomeranian. In contrary, Simon *et al.* (2011) [17] and Bidari *et al.* (2023) [3] reported high incidence of forelimb fractures in Non-descript dogs followed by Spitz and Labrador Retriever. The differences in the order of incidence among these studies suggest that the prevalence of forelimb lameness might vary across different regions or populations depending on the population of this breed in surrounding areas.

Table 4: Breed-wise incidence of forelimb lameness

S. No.	Breed	No. of animals	Percentage
1	Spitz	76	20.2%
2	Pomeranian	73	19.4%
3	Non- descript	58	15.4%
4	Labrador	45	11.9%
5	German shepherd	36	9.5%
6	Rottweiler	26	6.91%
7	Shih-Tzu	22	5.85%
8	Daschund	17	4.52%
9	Great dane	12	3.19%
10	Pug	11	2.92%
	Total	376	

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