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Dr. K Ramesh

Ph.D, Scholar, Department of Veterinary Medicine, College of Veterinary Science, Rajendranagar, Hyderabad, Telangana, India

Dr. K Satish Kumar

Professor & University Head, Department of Veterinary Medicine, College of Veterinary Science, Rajendranagar, Hyderabad, Telangana, India

Dr. P Nagaraj

Professor & Head, Department of Veterinary Medicine, College of Veterinary Science, Korutla, Jagtial, Telangana, India

Dr. BDP Kala Kumar

Professor & University Head, Department of Veterinary Pharmacology, and Toxicology, C.V.Sc., Mamnoon, Warangal, Telangana, India

Dr. M Lakshman

Professor & University Head, Department of Veterinary Pathology, College of Veterinary Science, Rajendranagar, Hyderabad, Telangana, India

Corresponding Author:**Dr. K Ramesh**

Ph.D, Scholar, Department of Veterinary Medicine, College of Veterinary Science, Rajendranagar, Hyderabad, Telangana, India

Incidence of hepatobiliary disorders in geriatric dogs

Dr. K Ramesh, Dr. K Satish Kumar, Dr. P Nagaraj, Dr. BDP Kala Kumar and Dr. M Lakshman

Abstract

The present study entitled “Studies on diagnosis of hepatobiliary disease and therapeutic management of hepatitis in geriatric dogs” was carried out to ascertain its incidence, history and clinical manifestations, hematobiochemical alterations, ascitic fluid analysis, radiographic findings, ultrasonographic changes, biomarkers estimation, histopathology findings and therapeutic management of hepatitis in geriatric dogs. In the present study, a total of 18,112 geriatric dogs were presented to the medicine ward of Veterinary Clinical Complex, College of Veterinary Science, Rajendranagar, during the period from January 2021 to October 2022. Out of which, 180 dogs were suspected for different hepatobiliary diseases which were further classified as hepatic disorders (36.11%), biliary tract disorders (16.67%) and hepatobiliary disorders (47.22%). However, 10 apparently healthy adult dogs served as control group. Higher incidence of overall hepatobiliary disorders in geriatric dogs was high in Labrador Retriever (16.11%) and lowest in Great Dane (14.81%), in case of hepatic disorders highest incidence was noticed in Labrador Retriever (18.46%) and lowest in Great Dane (03.07%), in case of biliary tract disorders, highest incidence was in Pomeranian (23.33%) and lowest in Great Dane (03.33%) and whereas hepatobiliary disorders cases was recorded highest in Labrador retriever and Pomeranian (55.17%) and lowest in Great Dane (01.18%). With respect to age and size of the dog breed, highest incidence of overall hepatobiliary diseases was seen in medium breeds (38.33%) and lowest in giant breeds (2.22%). The incidence of hepatic disorders was highest in the medium breed of older age dogs (26.08%) and lowest in giant breeds (3.33%), biliary tract disorders was highest in the medium breed of older age dogs (17.39%) and in giant breeds (4.35%) and hepatobiliary disorders was highest in the large breed of older age dogs (61.67%) and lowest in giant breeds (1.03%). Further, sex- wise incidence of hepatobiliary disorders was more in females (60.00%) than males (40.00%).

Keywords: Hepatobiliary disease, hepatic disease, biliary disease, hepatitis, geriatric dogs, incidence

Introduction

Hepatobiliary disease is among the leading causes of morbidity and mortality in small animals (Assawarachan *et al.* 2019) [2]. There will be substantial changes in liver blood flow, volume, morphology and normal physiology in geriatric population (Ghavimi *et al.*, 2019) [8]. Canine hepatic dysfunction is undetected during the early stages and so is a common cause of non-accidental death in dogs. The estimated frequency of canine hepatitis varies with the investigated population and accounts for 1-2% in it (Poldervaart *et al.* 2009) [13], and up to 12% in general population (Watson *et al.* 2010) [22]. Liver is the most important and metabolically active parenchymal organ in the body (Singh *et al.*, 2019) [20]. This is an advantageous property of hepatic tissue; it imposes a challenge to the clinician to evaluate a hepatic insufficiency before a significant proportion of the liver is affected. Hepatobiliary dysfunctions are usually caused by infectious, non-infectious, auto-immune and reactive causes. It can be acute and chronic. The most encountered liver diseases in dogs and cats are hepatic lipidosis, cholangio- hepatitis, portosystemic shunt, cholelithiasis, choledocholithiasis, cholecystitis, pneumobilia, hepatic neoplasia and even blunt trauma may result in hepatobiliary dysfunctions (Negasee, 2021) [11]. In the hepatic dysfunction, the results can be catastrophic. One of the more distinctive signs of liver dysfunction is icterus, while most of the clinical signs occurring with hepatic dysfunction are largely nonspecific, including abdominal distention followed by inappetence, pale mucous membrane, lethargy, respiratory distress, limb edema, vomiting, ascites, constipation or diarrhea, polyuria and polydipsia, weight loss and coagulation abnormalities, lethargy and abdominal pain (Negasee, 2021) [11]. These signs may be because of the underlying etiology or related to the numerous complications which can occur in the more advanced stages of liver dysfunction like cerebral edema and sepsis (Ettinger, 2010) [7] could lead to great morbidity and high mortality rate if immediate consideration is not followed.

Materials and Methods

The present study was conducted to investigate hepatobiliary diseases in geriatric dogs presented to Veterinary Clinical Complex, College of Veterinary Science, Rajendranagar during the period from January 2021 to October 2022. With the clinical signs of anorexia, ascites, jaundice, pale mucous membranes, vomiting, lethargy, polyuria and polydipsia and other manifestations suggestive of hepatobiliary disorders were selected. While, apparently healthy adult dogs presented for general health checkup and vaccination with no clinical signs were selected randomly as healthy control group for this study.

Results and Discussion

In the present study, different hepatobiliary diseases which were classified as hepatic disorders (36.11%), biliary tract disorders (16.67%) and hepatobiliary disorders (47.22%). Breed wise incidence of overall hepatobiliary disorders was found to be highest among Labrador Retrievers (16.11%) and least among Great Danes (02.22%). These findings were in agreement with Bexfield *et al.* (2012) [5], Selgas *et al.* (2014) [18], Saxena *et al.* (2016) [17] and Bandara *et al.* (2021) [3] who has reported highest incidence of hepatobiliary disorders in Labrador Retrievers. In contrary, Dixit *et al.* (2010) [6] and Pooja *et al.* (2010) [14] reported highest incidence of hepatic dysfunctions in Pomeranian breed. While, Vijay Kumar *et al.* (2001) [21] and Bandhyopadhyay *et al.* (2007) [4] observed highest incidence of cholecystitis and biliary sludge among German shepherd and Pomeranian breeds, respectively. High incidence of hepatobiliary disorders in Labrador Retriever breed might be attributed to their hereditary factors (Anderson and Sevelius, 1991) [1]. It could also be due to high population of Labrador Retrievers in the area, where the present study was carried out. In the present study, the geriatric status that was varied with the size of the dog breed was classified as small size breeds (<15 kg) > 11 years, medium size breeds (16-25 kg) > 10 years, large size breeds (26-45 kg) > 8 years and giant breed dogs (> 45 kg) > 7 years. There was higher incidence of overall hepatobiliary disorders was seen in medium breeds (38.33%) and least in giant breeds (2.22%). These findings were partially in agreement with Mircean *et al.* (2008) [10], Pradhan *et al.* (2008) [15], Bexfield *et al.* (2012) [5], Saxena *et al.* (2016) [17], Lakshmi *et al.* (2017) [9], Webster *et al.* (2019) [23] and Bandara *et al.* (2021) [3] who has reported highest incidence of hepatobiliary disorders in medium breed

of older age dogs. While Dixit *et al.* (2010) [6] and Saravanan *et al.* (2014) [16] reported higher incidence of hepatobiliary disorders in small breed of older age dogs. While, crossbreed was found to be protected against hepatobiliary disease compared to other breeds (Bandara *et al.* 2021) [3]. Similarly, sex-wise incidence of overall hepatobiliary disorders in dogs was more common in females (60.00%) as compared to males (40.00%). These findings were in agreement with Poldervaart *et al.* (2009) [13], Dixit *et al.* (2010) [6], Pooja *et al.* (2010) [14] and Selgas *et al.* (2014) [18], who observed higher incidence of hepatobiliary disorders among older dogs of females, than males. In contrary, Neumann and Danner (2012) [12], Saravanan *et al.* (2014) [16] and Singh *et al.* (2019) [20] documented that liver diseases were more common among older dogs of males, than females. While, Shih *et al.* (2007) [19] and Assawarachan *et al.* (2019) [2] recorded no gender bias as the incidence in dogs affected with hepatobiliary disorders had equal incidence among the both sexes. The reason for higher incidence of hepatobiliary disorders in females might be the preference of the people of the area under study towards having female dogs than males.

Table 1: Incidence of various hepatobiliary disorders in geriatric dogs (n=180)

S. No.	Parameter	No. of dogs	Incidence (%)
1.	Hepatic disorders	65	36.11
2.	Biliary tract disorders	30	16.67
3.	Hepatobiliary disorders	85	47.22
4.	Total	180	100

Table 2: Breed - wise incidence of overall hepatobiliary disorders in geriatric dogs (n=180)

S. No	Breed	No. of dogs	Percentage (%)
1	Labrador retriever	29	16.11
2	Pomeranian	27	15.00
3	German Shepherd	21	11.67
4	Dachshund	18	10.00
5	Spitz	18	10.00
6	Pug	15	08.33
7	Doberman	15	08.33
8	Rottweiler	12	06.67
9	Boxer	8	04.44
10	Cocker spaniel	7	03.89
11	Dalmatian	6	03.34
12	Great Dane	4	02.22
	Total	180	100

Table 3: Breed - wise incidence of various hepatobiliary disorders in geriatric dogs (n=180)

S. No	Breeds	Hepatic disorders (n=65)		Biliary tract disorders (n=30)		Hepatobiliary disorders (n=85)	
		N	%	N	%	N	%
1	Labrador retriever	12	18.46	3	10.00	14	16.47
2	Pomeranian	6	09.23	7	23.33	14	16.47
3	German Shepherd	6	09.23	5	16.67	10	11.76
4	Daschund	5	07.69	2	06.67	11	12.94
5	Spitz	6	09.23	3	10.00	9	10.59
6	Pug	6	09.23	2	06.67	7	08.23
7	Doberman	6	09.23	3	10.00	6	07.05
8	Rottweiler	5	07.69	1	03.33	6	07.05
9	Boxer	5	07.69	1	03.33	2	02.35
10	Cocker spaniel	4	06.15	1	03.33	2	02.35
11	Dalmatian	2	03.07	1	03.33	3	03.53
12	Great Dane	2	03.07	1	03.33	1	01.18
	Total	65	100.00	30	100.00	85	100.00

Table 4: Age-wise incidence of overall hepatobiliary disorders in geriatric dogs (n=180)

S. No	Age of the dog	No. of dogs	Percentage (%)
1	Small breeds (<15 kg) > 11 years	47	26.11
2	Median breeds (16-25) > 10 years	69	38.33
3	Large breeds (26-45) > 08 years	60	33.34
4	Giant breeds (>45kg) > 07 years	4	2.22
	Total	180	100.00

Table 5: Age -wise incidence of various hepatobiliary disorders in geriatric dogs

S. No	Age of the dog	Hepatic disorders (n=65)		Biliary tract disorders (n=30)		Hepatobiliary disorders (n=85)	
		n	%	n	%	N	%
1	Small breeds (<15 kg) >11 years	18	27.69	8	26.67	21	24.70
2	Median breeds (16-25) >10 years	25	38.46	12	40.00	32	37.65
3	Large breeds(26-45) >08 years	20	30.77	9	30.00	31	36.47
4	Giant breeds(>45kg) >07 years	2	03.08	1	03.33	1	01.18
	Total	65	100.00	30	100.00	85	100.00

Table 6: Sex- wise incidence of overall hepatobiliary disorders in geriatric dogs (n=180)

S. No	Sex of the dog	No. of dogs	Percentage (%)
1	Male	72	40.00
2	Female	108	60.00
	Total	180	100

Table 7: Sex -wise incidence of various hepatobiliary disorders in geriatric dogs

S. No	Sex	Hepatic disorders (n=65)		Biliary tract disorders (n=30)		Hepatobiliary disorders (n=85)	
		n	%	n	%	n	%
1.	Male	30	46.15	11	36.67	31	36.47
2.	Female	35	53.85	19	63.33	54	63.53
	Total	65	100.00	30	100.00	85	100.00

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