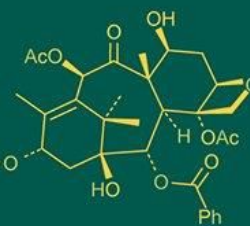
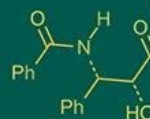


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Occurrence of ascites in dogs in and around Gannavaram, India

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Abstract

The present investigation was carried out at VCC, NTR College of veterinary science, Gannavaram from June to December 2022 to know the occurrence of ascites in dogs in and around Gannavaram. In current study a total of 4704 dogs were screened for ascites. The dogs that were diagnosed with abdominal effusion based on ultrasonography formed the material for the study. The occurrence of ascites was documented according to breed, age, gender, and etiology. The dogs were classified into different age groups such as less than 1 year, 1-4 years, 4-7 years and > 7 years. The affected dogs were categorized into distinct groups based on their underlying causes and comparative evaluation between groups was carried out. Out of 4704 dogs screened, 48 were diagnosed with ascites thus the overall occurrence of ascites was 1.02 per cent. The common causes of ascites reported were hepatic origin (43.75%), cardiac origin (20.83%), renal origin (12.50%), mixed origin (14.59%), parasitic origin (4.17%) as well as hypoproteinemia and neoplastic origin (2.08%) each. Occurrence was higher in male dogs (58.33%) aged above seven years (37.50%) and Labrador Retriever (39.58%) was most commonly affected breed.

Keywords: Ascites, occurrence, etiology, age, sex, breed

Introduction

There is an increasing global trend, to consider dog as a part of the family. Because pets are considered as family members by many people, proper healthcare of companion animals is of great importance to pet owners and professionals. Moreover, increased use of dogs in national security and disaster management warrant for timely diagnosis and management of canine health problems. The word ascites derived from Greek word “askos” means “bag” and “ites” means “like a” It is also known as “hydroperitoneum drops”. Ascites is commonly referred as the pathologic accumulation of fluid in the abdominal cavity due to escape of fluid from blood vessels, lymphatics, internal organs or abdominal masses between the parietal and visceral peritoneum ^[23] and it is also one of the sequelae of various primary diseases ^[14]. It can disrupt fluid and electrolyte metabolism, restrict breathing, and cause general discomfort ^[15]. Ascites is caused by a variety of etiological factors *viz.* chronic hepatic failure, congestive heart failure, nephritic syndrome, malnutrition, hypoproteinemia, and protein losing enteropathy, heavy parasitism and abdominal neoplasia of different origin. Ascites is always a sign of disease; therefore investigation must be aimed at identifying the underlying route cause. The limited knowledge of the specific causes and clinico-pathological alterations leads to difficulty in the management of ascites cases. Keeping this in view, the present study was undertaken to know the occurrence and causes of ascites in dogs in and around Gannavaram.

Materials and Methods

The dogs brought to the Veterinary Clinical Complex (VCC), Gannavaram with complaint of abdominal distension and positive for fluid thrill on tactile percussion were selected. The selected dogs were subjected to abdominal ultrasonography and the condition was confirmed based on the presence of abdominal effusion. In current study a total of 4704 dogs of different breeds, age groups of either sex were screened for ascites. The cause of ascites was ascertained based on detailed clinical examination, haemto-biochemical, imaging studies and peritoneal fluid analysis.

The occurrence of ascites was further evaluated based on breed, age, gender, and etiology. The affected dogs were categorized into distinct groups: Group I (Hepatic origin), Group II (Cardiac origin), Group III (Renal origin), Group IV (Mixed origin, involving more than one organ), and Group V (Others/Miscellaneous, including parasitic, hypoproteinemic, and neoplastic origins). The dogs were classified into different age groups such as less than 1 year, 1-4 years, 4-7 years and > 7 years [5]. The data obtained was subjected to statistical analysis as per the method described by Snedecor and Cochran [21] by using SPSS 20.00 version.

Results and Discussion

During the study period from June to December 2022, a total of 4,704 dogs were screened at the Veterinary Clinical Complex (VCC) at NTR College of Veterinary Science, Gannavaram. Out of these, 48 dogs were diagnosed with ascites, resulting in an overall occurrence of 1.02%. This finding aligns closely with previous reports of Ihedioha *et al.*

al. [9], Behara *et al.* [3] and Apurva [2] who reported the occurrence of ascites as 0.78 percent, 0.59 per cent and 0.82 per cent respectively.

Definitive diagnosis of ascites was established through clinical findings, hemato-biochemical analyses, ascitic fluid evaluation, and imaging studies, including ultrasonography, electrocardiography, and echocardiography. Out of 48 ascitic dogs, 21 dogs had ascites due to hepatic origin (43.75%), cardiac origin in 10 dogs (20.83%), renal origin in 6 dogs (12.50%), mixed origin (Involvement of more than one organ) in 7 dogs (14.59%), parasitic origin in 2 dogs (4.17%) and ascites due to hypoproteinemia and neoplastic origin was observed in one dog each (2.08%) respectively. (Figure 1). These observations were similar with the findings of Kumar *et al.* [12]; Dixit *et al.* [6]; Saravanan *et al.* [17]; Behera *et al.* [3] and Bhatti [5] who reported higher distribution of ascites of hepatic origin among the total ascitic dogs.

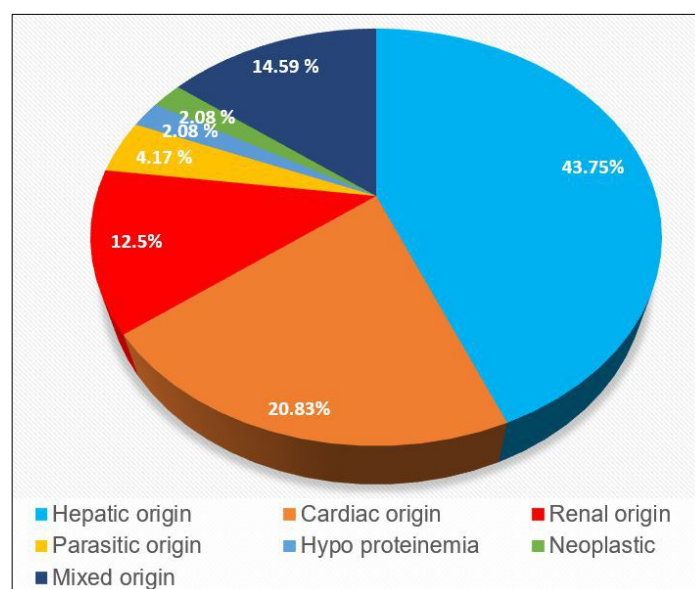


Fig 1: Etiology of ascites in dogs under study (n=48)

Age wise occurrence

Age wise occurrence of ascites in dogs revealed that eighteen dogs (37.5%) were in the age group of > 7 years followed by fourteen dogs (29.17%) between 1-4 years of age, twelve dogs (25.00%) were in age group of 4-7 years and four dogs (8.33%) were aged below 1 year. The occurrence of ascites was higher in the dogs aged above seven years (Table 1). The findings of the present study were almost in concurrence with those of Behera *et al.* [3] and Kumar *et al.* [13] while Dixit *et al.* [7] reported that majority of ascites affected dogs were in the age group of 5-10 years. The higher occurrence of ascites in dogs aged > 7 years as observed in this study could be attributed to damage of vital organs (heart, liver, kidney) or failure of function due to senility [3].

Table 1: Age wise occurrence of ascites in dogs(n=48)

S. No.	Age group	No of dogs	Percentage (%)
1.	< 1 year	4	8.33
2.	1-4 years	14	29.17
3.	4-7 years	12	25.00
	>7 years	18	37.50
	Total	48	100.00

In Group I (hepatogenic ascites) majority of dogs 33.33 per cent of the dogs were in the age group of 1-4 years, followed by 28.57 per cent dogs (6/21) were aged above > 7 years, 19.05 per cent (4/21) each were in between 4-7 years and less than one year. Higher occurrence of ascites of hepatic origin in younger age group (1-4 years age) was also reported by the previous researchers [4, 10, 11]. Chronic hepatitis was identified as the primary cause of ascites in dogs aged between 1 to 4 years [5]. The higher incidence of hepatogenic ascites in this young age group could be attributed to the indiscriminate use of medications, such as antibiotics and dewormers [3].

Fifty per cent (5/10) of the dogs suffered from ascites due to cardiac origin (Group II) were in the age group of 4-7 years and 40 per cent (4/10) were aged above 7 years and 10 per cent (1/10) were in between 1-4 years. Similar findings were reported by Ihedioha *et al.* [9] and Alsaad *et al.* [11] they also recorded highest incidence of ascites of cardiac origin in dogs of 3 years and above. This increased frequency of cardiac insufficiency resulting in ascites could be attributed to the increased popularity of those breeds (Giant breeds like Doberman, Great danes, Labrador retriever etc.) which

were prone to heart diseases and dilated cardiomyopathy was most frequent cause of ascites in dogs [8].

Majority of ascitic dogs (50.00%) of renal origin (Group III) were aged above 7 years while two dogs (33.33%) were in between 4-7 years and one dog (16.67%) represented the age group of 1-4 years. The findings of the present study were almost in agreement with those of Apurva [2] who reported that 57.14 percent of ascitic dogs with renal origin were observed in the age group of 5 to 10 years. The higher incidence of nephrogenic ascites in geriatric dogs (>7 years) might be due to loss or improper kidney function with advancement of age.

In dogs aged above 7 years, ascites of mixed origin (Group IV) was most prevalent, accounting for 57.14% of cases, followed by 28.57% in the 1-4 years age group and 14.29% in the 4-7 years age group. Among the four dogs classified with miscellaneous causes (Group V), three dogs aged 1-4 years had ascites due to parasitic infections and hypoproteinemia, while one dog older than 7 years developed ascites as a result of neoplasia. In present study the higher incidence of ascites due to parasitism and hypoproteinemia in the 1-4 years age group was in agreement with findings of Behera *et al.*, [3] who reported severe hypoproteinemia and ascites in young pups affected by intestinal parasites.

Irrespective of origin of ascites, age wise incidence showed that younger dogs had a lower prevalence while older dogs had higher prevalence. This could be attributed to failure or damage of vital organs (heart, liver and kidney) that results into ascites except when the organ failure was congenital [13].

Breed wise occurrence

Breed wise distribution of ascites revealed the occurrence of ascites was more in Labrador Retriever (39.58%) followed by Non-descript (18.75%), Pomeranian (10.42%), Doberman (8.33%) Rottweiler (6.25%), Beagle, Poodle and Golden Retriever (each 4.17%) whereas German Shepherd and Pakistan Bull Mastiff breeds (2.08% each) (Figure 2). Similar findings were also observed by Behera *et al.* [3], Bhatti [5] and Prathiba *et al.* [16].

However Saravanan *et al.* [18] and Singh *et al.* [20] reported that occurrence of ascites was more in Pomeranian and Ihedioha *et al.* [9] observed higher occurrence of ascites in Alsatian-Rottweiler crosses. These variations in the breed wise occurrence could be attributed to the preference of dog owners in keeping particular breeds in their locality. As ascites occur due to involvement of multiple organs, genetic makeup and breed predisposition also might be responsible for the breed wise variations.

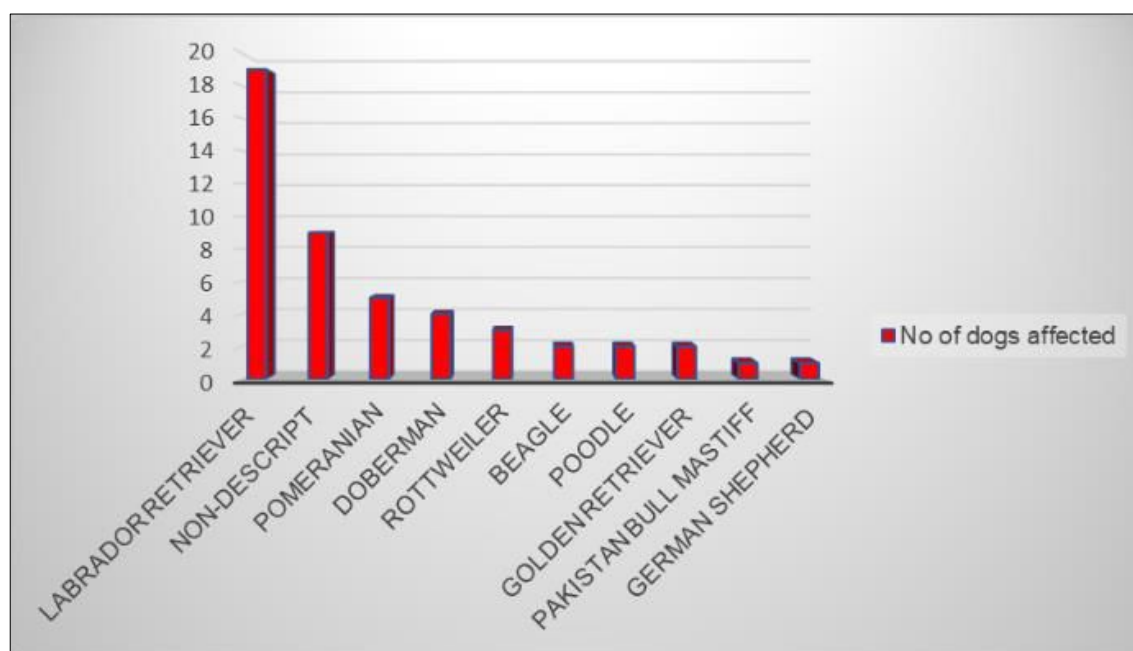


Fig 2: Breed wise occurrence of ascites in dogs(n=48)

Gender wise occurrence

In the present study forty eight dogs affected with ascites comprised of twenty eight males (58.33%) and twenty females (41.67%) as presented in Figure 3. These findings gained support from the reports of Dixit *et al.* [6] and Bhatti [5] whereas Upadhyay [22], Behera *et al.* [3], Apurva [2] and Prathiba *et al.* [16] reported higher prevalence of ascites in

females compared to males. This higher occurrence of ascites in male dogs in the present study could be due to over representation of male dogs owing to the preference of pet owners to male dogs [19]. But Ihedioha *et al.* [9] reported no significant association between the prevalence and sex of the animal.

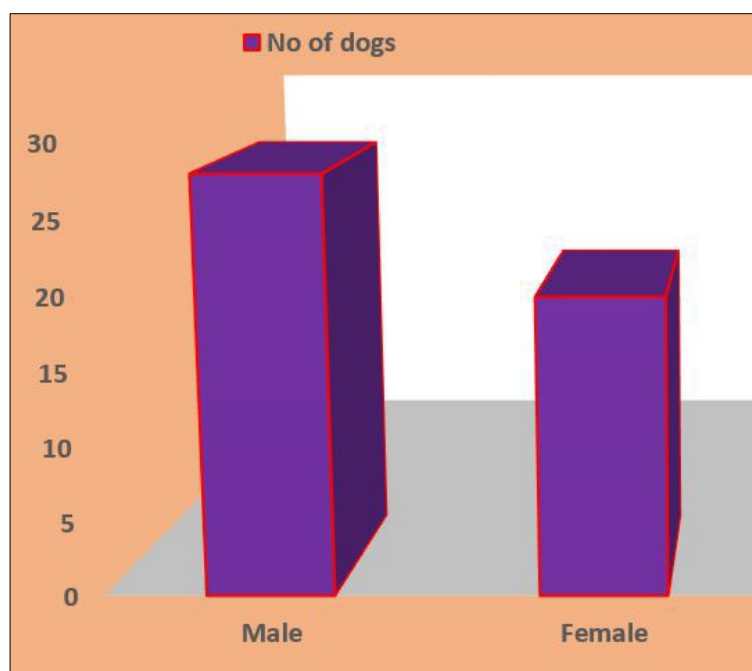


Fig 3: Gender wise occurrence of ascites in dogs(n=48)

Conclusion

The overall occurrence of ascites in and around Gannavaram was found to be 1.02%. In current study ascites was more prevalent in dogs aged above 7 years. The Labrador Retriever emerged as the most commonly affected breed and male dogs were more frequently diagnosed with ascites than female dogs. In present study, ascites of hepatic origin was the most commonly observed type.

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