



Retrospective Study of Ascites in Canines of North Gujarat Region


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ABSTRACT

The present work was conducted to evaluate the trend of ascites in canines of the North Gujarat region, India during 2017–2020. A total of 5094 dogs were presented for diverse clinical history at Veterinary Clinical Complex Deesa and Dantiwada. Amongst the dogs evaluated with clinical approach supported by ultrasonographic investigation in ascites suspected cases, total 91 were found affected. A thorough evaluation was conducted on all the dogs for various clinical signs. In most cases, the prominent clinical signs were abdominal distension, abnormal heart sound, and lethargy. History of no deworming was noticeable feedback from dog owners. Year wise prevalence of ascites was noted as 1.12% (2017), 1.12% (2018), 1.38% (2019) and 3.25% (2020) irrespective of etiologies. An increasing trend of ascites cases was observed over the years under evaluation. Female dogs were found more prone to ascites condition. Higher prevalence was observed in dogs one to the 5-year age group. Maximum numbers were reported from non-descript breed (n=19), labrador (n=13) and German shepherd (n=10). Anechoic fluid and fibrin in the abdominal cavity were consistent findings in most cases during ultrasonographic evaluation. Ascites can be prevented by regular deworming and by diet management.

KEYWORDS: Ascites, Canine, North Gujarat, prevalence, retrospective, ultrasonography

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Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, authors have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

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1. INTRODUCTION

Accumulating unnecessary fluid in the peritoneal cavity is a collective pathological condition seen in canines due to various etiologies (Moore et al., 2003, Zoia et al., 2017a). Ascites represent a general systemic state that could manifest in diverse disease conditions in animals. The vital organs like liver, kidney, and heart are predominantly involved in the development of ascites. Chronic hepatic failure, malnutrition, protein deficiency, and parasitic load are prominent causative factors (Greve et al., 1979, Pradhan et al., 2008, Dabas et al., 2011, Sykes, 2014, Kumar et al., 2016, Srivastava et al., 2017, Webster et al., 2019, Berman et al., 2020). True ascites refer to an accumulation of serous or serosanguinous fluid in peritoneal space (Ettinger and Feldman, 2005). A more generalized description includes distension of the abdomen with other fluid, e.g., chyle, blood, and inflammatory exudates (Pradhan et al., 2008). Previously, ascites were divided into two major types, transudative and exudative, depending on the total protein concentration of ascitic fluid: transudates and exudates. Based on the premise, ascites are classified broadly into hepatic, pre-hepatic, and post-hepatic origins. The development of ascites occurs when there is an alteration in Starling's forces, including accelerated venous and lymphatic hydrostatic strain, vascular permeability, extended intraperitoneal oncotic stress, and decreased osmotic capillary pressure, cardiac, renal, and hepatic disorders, separately or conjointly, play an essential predisposing role in the etiology of ascites (Center, 2004). Factors contributing to ascites include age, sex, continuous exposure to high levels of toxins, etc. (Muller et al., 2000, Aitken et al., 2003). Prognosis is poor in young pups compared to adult dogs (Dabas et al., 2011). Peritonitis is a typical sequel of ascites (Gerding et al., 1976, Martiny and Goggs, 2019). Changes in dog food origin from a non-vegetarian to a vegetarian diet is one of the predisposing factors for the development of ascites (Dixit et al., 2018). The development of portosystemic shunt is also one of the primary causes of ascites development in canines. Chronological conduction of physical and clinical examinations aids in pointing out the underlying cause of ascites. However, this may not constantly be so, as diagnosis frequently is burdensome (Han et al., 2009, Ford and Mazzaferro, 2012, Salgado et al., 2012). The holistic approach was adopted for the treatment of all cases. Diagnosis of the portosystemic shunt can be made by ultrasonography, but it is somewhat tricky in small breeds of dogs (Sreemannarayana et al., 1970).

The diagnosis of ascites could often be cumbersome, considering the myriad of diseases implicated in the condition. Standard diagnostic procedures include physical examination, clinical examination, ultrasonography, computed tomography, serum ascites albumin gradient

(SAAG), and biochemical analysis such as triglyceride, urea, creatinine concentration, total protein, etc. (Guiou et al., 2015, Zoia et al., 2017b). Clinical examination with imaging techniques is considered helpful in documenting the cause of ascites. Edema in all four limbs and lethargy are common findings in canines having ascites. Ultrasonography is a valuable tool for various diseases, including ascites in canines (Center, 2012). Ultrasonography along with hemato-biochemical analysis like albumin, total protein, and SGPT aids in deciding the therapeutic management of an individual dog. Evaluation of ascites fluid also directs the attending person towards proper treatment. Such conditions require prolonged aggressive therapy, but this condition's prognosis is poor to the grave (Raffan et al., 2009). Resting and restriction in salt intake with a high protein diet fasten the recovery in individual dogs affected by ascites. The present study was conducted to explore the overall, sex-wise, age-wise, and breed-wise prevalence of ascites in canines of the North Gujarat region based on retrospective data available on clinical signs and ultrasonographic investigations.

2. MATERIALS AND METHODS

The present study was executed at the veterinary clinical complex, Deesa, and Dantiwada for four years, from 2017–2020. A total of 5094 dogs were presented at the clinic from various areas of North Gujarat, India and evaluated for the prevalence of ascites in different breeds irrespective of any causative agent. A total of 5094 dogs were evaluated from January 2017 to December 2020 for ascites conditions. A thorough clinical examination was performed in all cases, and various clinical findings were noted. Abdominal palpation was executed to check the consistency of accumulated material. The ascites were confirmed based on clinical examination and ultrasonographical results using a 2.5–5MHz convex probe. Abdominal paracentesis was executed in critical cases to relieve the fluid pressure from the abdomen. Overall, age-wise, sex-wise, and breed-wise, the prevalence was calculated. Age was broadly classified into four types; 0–1 year, 1–5 years, 5–10 years, and more than ten years.

3. RESULTS AND DISCUSSION

In the present study, a total of 5094 dogs were evaluated for the presence of ascites irrespective of any etiological agent. Ninety-one dogs were found affirmative for ascites based on clinical and ultrasonographical examination. Various clinical findings were observed in different breeds of dogs listed in Table 1. Lethargy, dyspnea, and cardiac murmur were the most evident clinical observations. Most dogs were presented at the clinic almost 15–20 days after abdominal distension.



Table 1: Different clinical findings in dogs with ascites condition (n=91)

Clinical observation	Number
Abdominal distension	91 (100%)
Vomiting	10 (10.99%)
Pale mucus membrane	27 (29.67%)
Lethargy	57 (62.64%)
Dyspnea	43 (47.25%)
Edema on leg	08 (08.79%)
Cardiac murmur	37 (40.66%)
Fibrin deposits in abdominal cavity	10 (10.99%)
No deworming	63 (69.23%)

Overall, 1.12%, 1.12%, 1.38%, and 3.25% prevalence were observed in the years 2017, 2018, 2019, and 2020 shown in table 2. The study revealed that ascites were not a common condition in canines, but the incidence is increasing daily, which is a matter of concern. Age-wise prevalence was also calculated in the present work, and it revealed that dogs in one to 5-year age groups were more prone to develop ascites followed by day-old to one year. Similar findings were reported by James et al. (2008). Aggressive treatment resulted in regression of fluid volume in the abdomen and improved condition in adult dogs. However, no clinical improvement was noted in dogs less than two years of age.

Table 2: Overall prevalence of ascites in dogs

Year	Annual case	Number of cases
2017	1156	13 (1.12%)
2018	1515	17 (1.12%)
2019	944	13 (1.38%)
2020	1479	48 (3.25%)

Out of 91 ascites dog cases, the maximum number (n=19) were of non-descript breed of the dog, followed by Labrador (n=13) and German shepherd (n=10). Negligence of deworming and malnutrition was one of the possible reasons for the higher incidence of ascites in the non-descript breed. The present study revealed that overall females were more predisposed to ascites. The exact cause is unknown, but it might be due to presinusoidal portal hypertension during post-whelping, as James et al. (2008) reported. Similar results were observed by Mani et al. (2013) in a study of 15 dogs from Bareilly (Table 3).

Ultrasonography is a non-invasive and easy-to-perform technique to rule out ascites in small animals, as described by Nyland and Mattoon (2014). USG was performed in all canines with abdominal distension for confirmation after clinical examination through palpation. The presence of

Table 3: Sex-wise prevalence of ascites in dogs

Year	Male	Female
2017	5 (0.43%)	8 (0.69%)
2018	7 (0.46%)	10 (0.66%)
2019	4 (0.42%)	9 (0.95%)
2020	20 (1.35%)	28 (1.89%)

anechoic fluid, fibrin, and floated liver lobe in the abdominal cavity were unfailing findings during ultrasonographical investigation. Similar results were also observed by Mani et al. (2014) and Chaturvedi et al. (2013). Radiographic evaluation of dogs can also be helpful for the differentiation of many conditions. Further investigations should be carried out to rule out the exact cause of ascites by estimating hemato-biochemical alterations for specific treatment (Chaturvedi et al., 2013) (Table 4 and 5).

Table 4: Age-wise prevalence of ascites in dogs

Year	Age			
	0-1 Year	1-5 Year	5-10 Year	>10 Year
2017	5 (0.43%)	8 (0.69%)	0 (0.00%)	0 (0.00%)
2018	8 (0.53%)	6 (0.39%)	3 (0.20%)	0 (0.00%)
2019	3 (0.32%)	7 (0.74%)	3 (0.32%)	0 (0.00%)
2020	9 (0.60%)	30 (2.03%)	7 (0.47%)	2 (0.14%)

Table 5: Prevalence of ascites in different breeds of dogs

Breed	Year			
	2017	2018	2019	2020
GSD	0 (0.00%)	2 (0.13%)	3 (0.32%)	5 (0.34%)
Labrador	2 (0.17%)	4 (0.26%)	4 (0.42%)	3 (0.20%)
Rottweiler	0 (0.00%)	2 (0.13%)	0 (0.00%)	0 (0.00%)
Doberman	1 (0.09%)	1 (0.07%)	0 (0.00%)	2 (0.16%)
Pomeranian	0 (0.00%)	2 (0.13%)	2 (0.21%)	5 (0.34%)
Non-Descript	10 (0.87%)	5 (0.33%)	2 (0.21%)	1 9 (1.28%)
Great Dane	0 (0.00%)	1 (0.07%)	0 (0.00%)	1 (0.07%)
Pug	0 (0.00%)	0 (0.00%)	1 (0.11%)	3 (0.20%)
Golden Retriever	0 (0.00%)	0 (0.00%)	1 (0.11%)	5 (0.34%)
Cocker spaniel	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.07%)
Lhasa Apso	0 (0.00%)	0 (0.00%)	0 (0.00%)	4 (0.27%)

Timely deworming is one of the preventive measures for internal parasitism. The basic idea for deworming and how parasites are responsible for hypoalbuminemia and ascites development is crucial for pet owners to understand and do

accordingly. Most of the dogs prefer non-vegetarian food over vegetarian. In the current condition, most pet owners choose a vegetarian or homemade diet which leads to protein

deficiency and eventually leads to ascites condition. Lack of knowledge is also responsible for such situations in dogs (Figure 1 to 4).



Figure 1: Abdominal distension in a dog (Lateral and dorsal view)

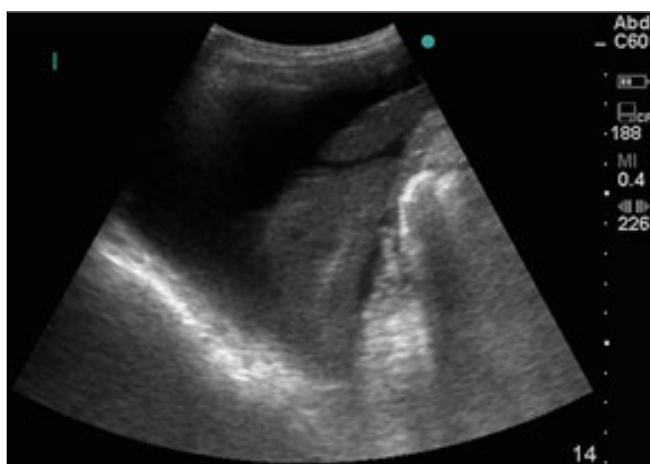


Figure 2: Anechoic fluid in the abdominal cavity with liver lobe



Figure 4: Liver lobe with hyperechoic surrounding structures

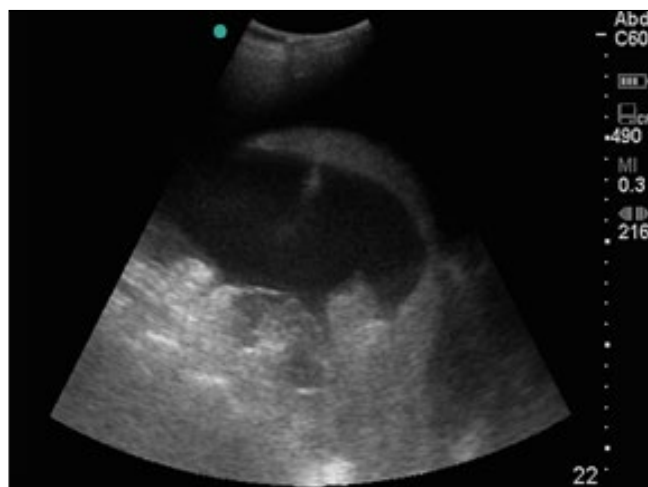


Figure 3: Floating liver lobe in the free fluid of abdominal cavity

4. CONCLUSION

Ascites is a scorching issue in canines, and their prevalence is increasing day by day. Abdominal distension is a significant clinical finding observed in dogs with ascites. Prevalence was higher in female dogs as compared to male dogs. One year to five-year age group was more prone to the development of ascites than any other age group of dogs. Prevalence was higher in the non-descript breed, followed by Labrador and German shepherd. Clinical examination and ultrasonography were accurate methods of diagnosis of ascites.

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