

INCIDENCE OF CANINE ASCITES IN AND AROUND BHUBANESWAR, ODISHA, INDIA

Monalisa Behera^{1*}, Susen Kumar Panda¹, I. Nath², M.R. Panda³, A.K. Kundu⁴, A.R. Gupta⁵ and S.S. Behera²

¹Department of Veterinary Pathology, ²Department of Veterinary Surgery & Radiology, ³Department of Veterinary Parasitology, ⁴Department of Veterinary Physiology, ⁵Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar, Odisha, India
E-mails: drmonalisabehera@gmail.com (*Corresponding Author)

Abstract: A total 9788 number of dog were presented for different clinical conditions in the Teaching Veterinary Clinical Complex (TVCC), College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar, Odisha during two years of the study period. Out of those cases dogs with clinical sign of gross abdominal distension were screened for canine ascites and 58 (0.59%) cases were found positive for ascites by using various diagnostic methods. All the positive cases were classified into six groups based on causative types such as, cardiac group, hepatic group, renal group, renal+hepatic group, genital group and parasitic group. In the present study it was found that hepatic dysfunction was the most common cause of ascites followed by renal, cardiac, parasitic and genital. The incidence study revealed that the breed wise prevalence was found to be more in Labrador retriever (41.37%) and age groups above six years (36.20%) were mostly found to develop ascites and the incidence was predominantly higher in females (58.63%) in comparison to males (41.37%) while month wise incidence was found to be highest in the month of April (24.14%).

Keywords: Ascites, dog, incidence

Introduction

Ascites is accumulation of excess fluid in peritoneal cavity and it occurs in response to various pathological processes (Ihedioha *et al.*, 2013). Patient can either present to veterinarians for clinical signs secondary to fluid accumulation or simply due to change in appearance because of fluid buildup (Mondal *et al.*, 2012). In this case the patients don't die suddenly and gross abdominal distension of dog creates an embarrassing situation for the owner. Involvement of vital organs, proper and early diagnosis and early treatment of the ascites is necessary, if not the condition may lead to death. Treatment is aimed at the underlying cause, reducing the symptoms and slowing down the progression of the disease. A thorough incidence study of canine ascites has not been reported earlier in the present study area and again there is very scanty literature regarding incidence and specific etiology.

*Received Nov 5, 2017 * Published Dec 2, 2017 * www.ijset.net*

Keeping this in view, the present study was undertaken to investigate the incidence of ascites in dogs.

Materials and Methods

Selection of animals

A total number of 9788 dogs were presented in the Teaching Veterinary Clinical Complex (TVCC), College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar, Odisha, having different clinical complications during two years of study period. Out of these 9788 numbers of dogs, 3652 dogs with clinical signs of gross abdominal distension were selected for the study as suspected cases of ascites. All the cases were thoroughly examined by different diagnostic methods like observing vital clinical signs (auscultation, palpation, percussion), haematology, serum biochemistry, peritoneal fluid analysis, electrocardiography, radiography, urinalysis, faecal sample analysis, post-mortem and histopathology. Based on all the parameters ascitic cases were screened and classified correlating different systemic dysfunctions. The age, sex, breed in all the cases were recorded.

Results

All the ascitic cases were classified into six groups on the basis of systemic dysfunctions such as, cardiac origin group (C), hepatic origin group (H), renal origin group (R), renal and hepatic origin group (RH), genital origin group (G) and parasitic origin group (P). Out of 3652 dogs with clinical signs of gross abdominal distension, 58 (0.59%) cases were screened positive for ascites by using various diagnostic methods. Out of the 58 cases, cardiac origin in 7 (12.06%), hepatic origin in 21 (36.2%), renal origin in 9 (15.51%), both renal and hepatic origin in 9 (15.51%), genital origin in 6 (10.34%) and parasitic origin in 6 (10.34%) cases were evident.

Age wise incidence

Age wise incidence was found slightly higher in > 6 years (36.21%) age group followed by 0-3 years (34.48%) and 3-6 years (29.31%). All the data were presented in tables 1,2 and charts 1,2. Again under cardiac group the age group of 3-6 year was found to be with higher incidence of 57.14% followed by 0-3 year (28.57%) and >6 year (14.28%). In hepatic group, 52.38% dogs belonged to 0-3 year age, 28.57% belonged to 3-6 year age group and 19.04% incidence in > 6 year age group. In renal and genital group, 66.66% belonged to > 6 year age group and 33.33% belonged to 3-6 year age group. In renal+hepatic group also 66.66% belonged to >6 year age group followed by 22.22% incidence in 3-6 year age group

and 11.11% in 0-3 year age group. In parasitic group, 100% incidence was observed in 0-3 year age group.

Table.1. Age wise incidence of ascites in dogs

Age	0-3 years	3-6 years	> 6 years
No. of Animals	20 (34.48%)	17 (29.31%)	21 (36.21%)

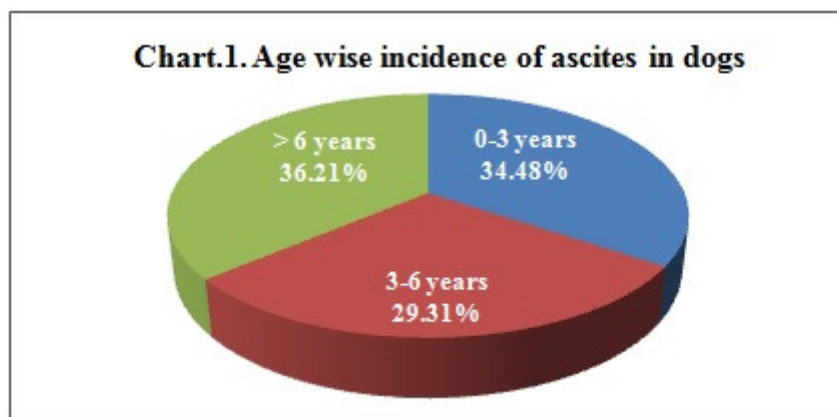
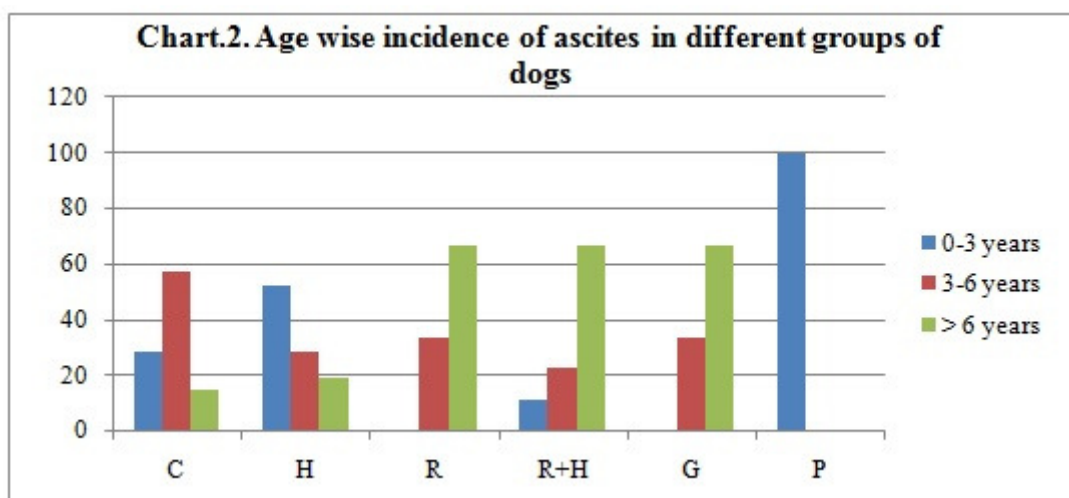


Table 2. Age wise incidence of ascites in different groups of dogs

Group	0-3 years	3-6 years	> 6 years
Cardiac (C)	2(28.57)	4 (57.14)	1(14.28%)
Hepatic (H)	11(52.38%)	6 (28.57%)	4 (19.04%)
Renal (R)	0	3 (33.33%)	6 (66.66%)
Renal+Hepatic (RH)	1(11.11%)	2 (22.22%)	6 (66.66%)
Genital (G)	0	2 (33.33%)	4 (66.66%)
Parasitic (P)	6(100%)	0	0

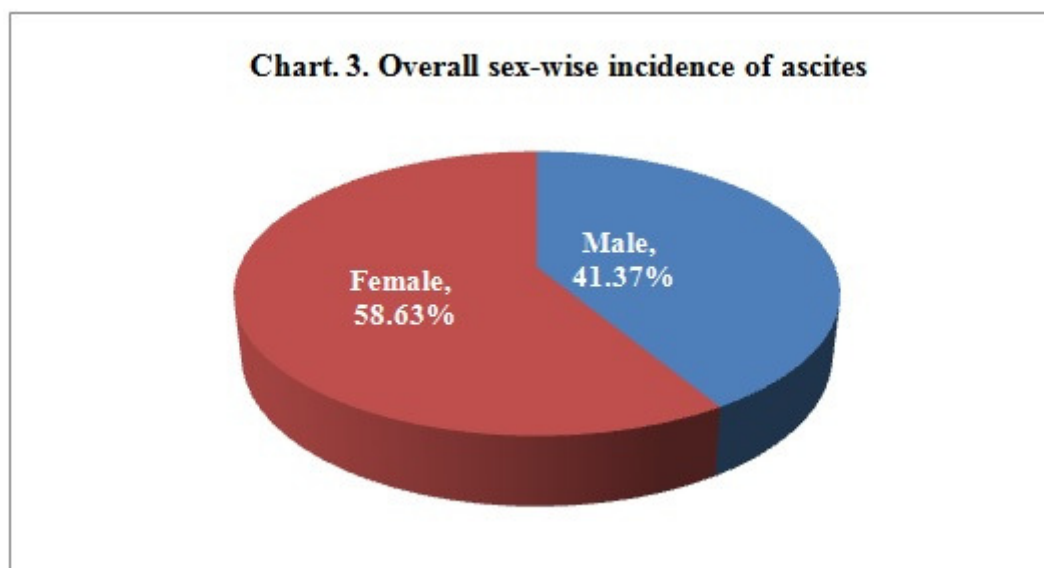


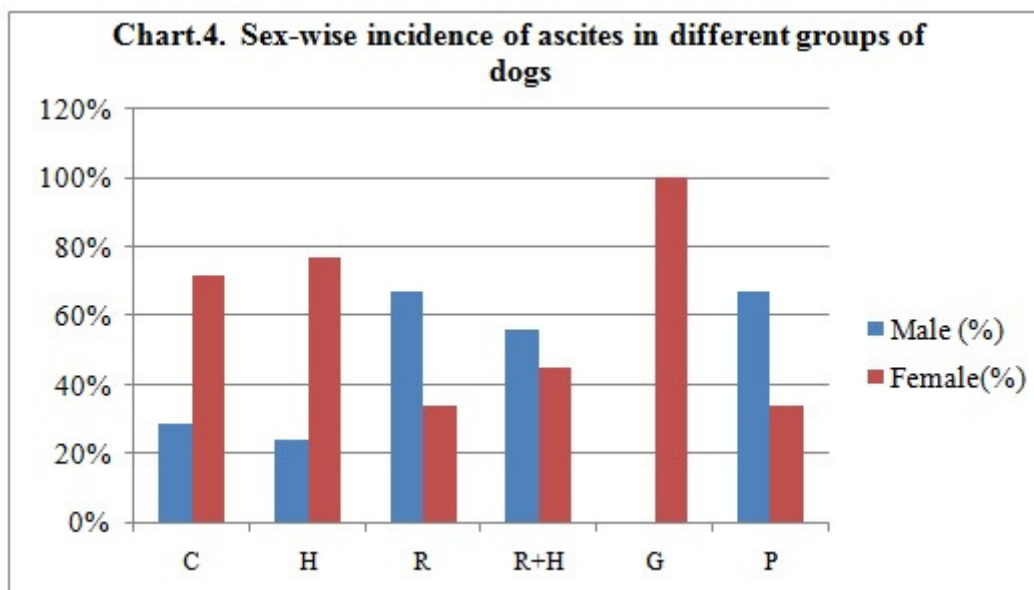
Sex wise incidence

On an average the sex wise incidence was found to be higher in females (58.63%) compared to males (41.37%). But on comparison of group wise incidence in renal and parasitic group incidences in males (66.66%) were higher than females (33.34%). However in cardiac, hepatic and genital group incidences in females were higher i.e., 71.43%, 76.80% and 100% respectively. In renal+hepatic group 55.5% were males and 44.5% were females. All the data were presented in table 3 and charts 3,4.

Table 3. Sex-wise incidence of ascites in different groups of dogs

Group	Total no of animals	Male (M)	Female (F)	M (%)	F (%)
Cardiac (C)	7	2	5	28.57%	71.43%
Hepatic (H)	21	5	16	23.80%	76.80%
Renal (R)	9	6	3	66.66%	33.34%
Renal+Hepatic (RH)	9	5	4	55.5%	44.5%
Genital (G)	6	0	6	0.0%	100%
Parasitic (P)	6	4	2	66.6%	33.4%
Total	58	24	34	41.37%	58.63%



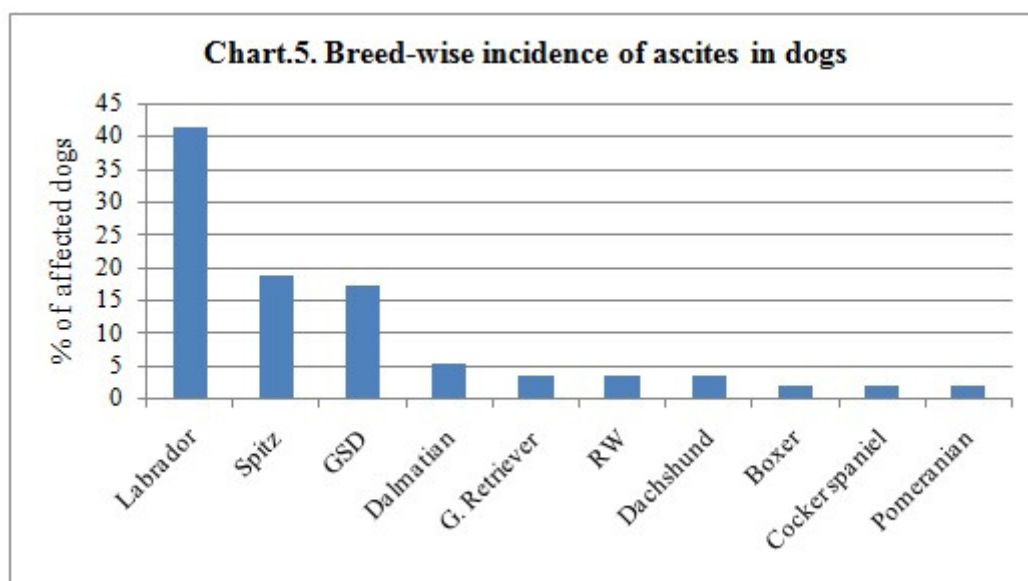


Breed wise incidence

The breed wise incidence was found to be higher in Labrador retriever (41.37%) followed by German spitz (18.9%), German shepherd (17.24%), Dalmatian (5.17%), Golden retriever, Rottweiler (3.44%), Dachshund (3.44%), Boxer (1.72%), Cocker spaniel (1.72%), Pomeranian (1.72%) (Table 4 and Chart 5).

Table 4. Breed-wise incidence of ascites in dogs

Name of the Breed	No. of animals	% of dogs affected
Labrador	24	41.37
Spitz	11	18.9
GSD (German shepherd)	10	17.24
Dalmatian	3	5.17
G. Retriever	2	3.44
RW (Rottweiler)	2	3.44
Dachshund	2	3.44
Boxer	1	1.72
Cocker spaniel	1	1.72
Pomeranian	1	1.72
Total	58	100

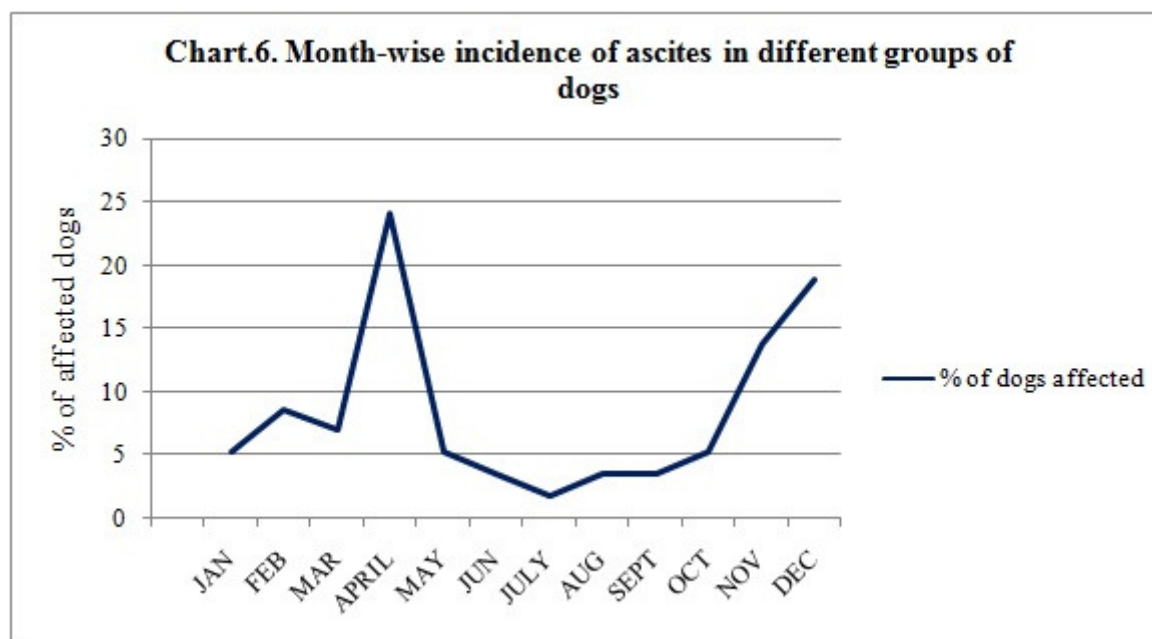


Month wise incidence

Month wise incidence was found to be highest in the month of April (24.14%) followed by December (18.97%), November (13.79%), February (8.62%), March (6.90%). In the month of July lowest incidence was noticed with a percentage of 1.72 (Table. 5 and Chart. 6).

Table 5. Month-wise incidence of ascites in different groups of dogs

Month	Cardiac group	Hepatic group	Renal group	Renal+Hepatic group	Genital group	Parasitic group	No. of Cases	% of dogs affected
JAN	1	-	1	1	-	-	3	5.17
FEB	-	4	-	1	-	-	5	8.62
MAR	1	3	-	-	-	-	4	6.90
APRIL	1	8	1	2	1	1	14	24.14
MAY	-	2	-	-	1	-	3	5.17
JUN	1	-	-	1	-	-	2	3.45
JULY	-	1	-	-	-	-	1	1.72
AUG	-	1	-	-	-	1	2	3.45
SEPT	-	2	-	-	-	-	2	3.45
OCT	1	1	-	-	1	-	3	5.17
NOV	-	4	2	1	-	1	8	13.79
DEC	1	7	2	-	-	1	11	18.97



Discussion

The incidence of ascitic dogs those presented at TVCC, College of Veterinary Science and Animal Husbandry, was 0.59%. The incidence study showed that ascites is not a commonly occurring disorder, but the incidence is growing day by day on comparison to past days. Parthasarathy (1966) reported a lower incidence of ascites of 0.22%. However, Ihedioha *et al.* (2013) reported prevalence ranging from 0.6-1%, with a mean of 0.78% in Enugu State of Nigeria. Dixit *et al.* (2010) studied 100 dogs with symptoms of melena and ascites and found 82 dogs having primary and 58 with secondary hepatopathies.

In the present study hepatic origin was found to be the most common cause (36.2%) for ascites. In hepatic origin, out of 21 cases 11 cases of ascites revealed acute hepatitis with the history of deworming. This condition suggested that the cause of ascites development might be due to acute drug toxicity. Genital and parasitic origins were having fewer occurrences with equal proportion (10.34% each). Ascites due to cardiac origin (12.06%), renal origin (15.51%), renal and hepatic origin (15.51%) were noticed with medium proportions. Sevelius (1995) observed that ascites was the most common clinical sign associated with liver diseases. In the present study also more ascitic case were presented with liver diseases. Runyon (1992) also stated that majority (75%) of patients who present with ascites have underlying cirrhosis, with the remainder being due to malignancy (10%), heart failure (3%), tuberculosis (2%), pancreatitis (1%), and other rare causes. However, contradict to the present study, Ihedioha *et al.* (2013) reported that most of the ascites cases were largely due to congestive heart failure (50% of cases); other causes were cirrhotic liver disease

(14.3%), chronic active hepatitis (21.4%) and kidney disease (14.3%). Other causes of ascites in dogs like ancylostomiasis (Turkar *et al.*, 2009; Bhatt *et al.*, 2011), fibrosis associated with migration of foreign body to the area (Smith, 1994) and ascites of splenic origin (Dabas *et al.*, 2011) were reported by other authors.

Irrespective of any group of origin age wise incidence was found to slightly higher in > 6 years (36.21%) age group followed by 0-3 years (34.48%) and 3-6 years (29.31%). The present finding is in agreement with Ihedioha *et al.* (2013). They reported that the age distribution in ascites showed that younger dogs had a lower prevalence while older dogs had a higher prevalence. This might be due to the fact that vital organs (heart, liver, kidney) damage or failure that responses to ascites is expected to occur more in older than younger animals except where the organ failure is congenital. The present study also supported by the earlier studies (Routray *et al.*, 2010, Pathak *et al.*, 2012, Saravanan *et al.*, 2012). However, incidence of ascites in dogs of younger age group were reported by Nottidge *et al.* (2003), James *et al.* (2008) and Turker *et al.* (2009).

Incidence of ascitic dogs due to hepatic origin was more commonly recorded in 0-3 year age group (52.38%). This high incidence in younger group might be due to indiscriminate use of drugs like antibiotics and dewormers without proper consultation with veterinarian, which was noticed in the present study. Crawford *et al.* (1985) observed that hepatitis was more common in middle aged dog which contradict with the present findings. Ascitic dogs with cardiac origin were having higher incidence in 3-6 year (57.14%) age group. Ettinger and Suter (1970) stated that valvular fibrosis begins in the early years and slowly progresses and leads to insufficiency in middle years and may be treated until late life and these factors precipitate to form generalized heart failure in middle and old aged dogs. The present finding is in agreement with Ettinger and Suter (1970). In renal and genital group, highest incidence of 66.66% belonged to > 6 year age group and 33.33% belonged to 3-6 year age group. This higher occurrence of ascites in >6 year age in both genital, renal and hepatic group might be due to the reduced organ function due to senility. In the present study high incidence of ascites due to parasitism was seen in dogs between 0-3 year age group (100%). This is in agreement with Nelson and Coute (1992) who observed severe hypoproteinaemia, life threatening anaemia and ascites in young pups suffering from intestinal parasites.

In the present study sex wise incidence was found to be higher in females (58.63%) compared to males (41.37%). In contrast to this finding, more prevalence of ascites was

recorded in male as compared to female dogs earlier (Das, 2012; Saravanan *et al.*, 2014). However according to Ihedioha *et al.* (2013) there is no significant association between the sex and prevalence. Higher incidence of ascites in male dogs has also been reported by Tyagi *et al.* (2004), Gabriel (2009) and Gualtieri *et al.* (2009), while higher incidence in female dogs has been reported by Strombeck *et al.* (1976), Crawford *et al.* (1985), Pradhan *et al.* (2008) and Routray *et al.* (2010). Speeti *et al.* (1996) reported an increased incidence of chronic hepatitis in female dogs. On comparison of group wise incidence in renal group and parasitic group incidence in males (66.66%) were higher than females (33.34%). However in cardiac, hepatic and genital group incidence in females were higher i.e., 71.43%, 76.80% and 100% respectively. In renal+hepatic group 55.5% were males and 44.5% were females.

The breed wise prevalence was found to be higher in Labrador retriever (41.37%) followed by German spitz (18.9%), German shepherd (17.24%), Dalmatian (5.17%), Golden retriever, Rottweiler (3.44%), Dachshund (3.44%), Boxer (1.72%), Cocker spaniel (1.72%), Pomeranian (1.72%). Indicating breed distribution to ascites revealed that Labrador retriever (41.37%) was highly susceptible than other breeds. Calvert *et al.* (1982) reported that the congestive cardiomyopathy was commonly seen in giant breed male dogs like Dobermann, Labrador etc. This also might be due to higher preference of dog owner for keeping Labrador breed in this locality. However Saravanan *et al.* (2012) observed that prevalence of ascitis was more in Spitz breed followed by Labrador and non- descript dogs. Ihedioha *et al.* (2013) found Alsatian-Rottweiler crosses had a significantly higher prevalence (50%) than all other breeds.

Month wise prevalence of ascites was found to be highest in the month of April (24.14%) i.e., during peak summer followed by lower prevalence in July (1.72%). This may be due to summer stress along with increased humidity leading to respiratory insufficiency followed by cardiac dysfunction and development of ascites.

Hence it was concluded that ascites occurs in dogs in the study area at an incidence of 0.59% and majority cases were due to hepatic origin i.e. 36.2%. Age wise incidence was found higher in > 6 years (36.21%) age group and sex wise incidence was found to be higher in females (58.63%). The breed wise incidence was found to be higher in Labrador retriever (41.37%), while month wise incidence was found to be highest in the month of April (24.14%). These findings will give some idea to the clinicians during diagnosis of ascites and to choose appropriate therapeutic regimens.

References

- [1] Bhatt P, Singh GD and Dabas YPS. 2011. Ancylostomiasis Associated Ascites in a Dog and its Therapeutic Management, *Intas Polivet*, **12**(1): 104-106.
- [2] Calvert CA, WL Chapman and RL Total. 1982. Congestive cardiomyopathy in Dobermann Pinscher Dogs, *Journal of American Veterinary Medical Association*, **181**: 598-602.
- [3] Crawford MA, Schall WD, Jensen RK, Taskar JB. 1985. Chronic active hepatitis in twenty six Doberman pinschers, *Journal of American Veterinary Medical Association*, **187** (12): 1343-1349.
- [4] Dabas VS, Suthar DN, Chaudhari CF, Modi LC and Vihol PD. 2011. Ascites of splenic origin in a mongrel female dog – a case report, *Veterinary World*, **4**: 376-377.
- [5] Das BR. 2012. Clinico-Biochemical studies on ascites in dog with special reference to hepatic insufficiency and its therapeutic management, M.V. Sc. Thesis submitted to Orissa University of Agriculture and Technology.
- [6] Dixit P, Varshney JP, Dixit AK and Shukla PC. 2010. Liver disease in dog a prospective study, *IntasPolivet*, **11**(2): 360-365.
- [7] Ettinger SJ and PF Suter. 1970. *Canine Cardiology*. W.B. Saunders Co. Philadelphia. Pp. 217-218.
- [8] Gabriel A. 2009. Chronic liver disease in dogs, *Proc. Southern European Veterinary conference*.
- [9] Gualtieri M, Cocci A, Monti S and Olivero D. 2009. Surgical removal of a localised vascular hepatic hamartoma in a dog, *Australian Veterinary Journal*, **87**(9): 360-362.
- [10] Ihedioha JI, Anosa VO and Esievo KAN. 2013. Prevalence of and clinicopathologic findings associated with ascites in dogs in Enugu State, Nigeria, *Comparative Clinical Pathology*, **22**: 185-193.
- [11] James F, Knowles G, Mansfield C and Robertson I. 2008. Ascites Due to Pre-sinusoidal Portal Hypertension in Dogs: A Retrospective Analysis of 17 Cases, *Australian Veterinary Journal*, **86**(5): 180-186.
- [12] Mondal DB, Kumar M, Saravanan M and Sharma K. 2012. Peritoneal fluid analysis in canine disease diagnosis, *Journal of Advanced Veterinary Research*, **2**(4):307-313.
- [13] Nelson WE and Coute CG. 1992. Disorders of the intestinal tract: In : Text Book of Essentials of Small animal internal medicine, Mostly year book Philadelphia, pp. 342-343.

- [14] Nottidge HO, Ajadi RA, Cadmus SIB, Shonibare O, Okewole EA, Taiwo VO, Emikpe B, Adedokun RAM and Oduye OO. 2003. Liver cirrhosis associated a nonresponsive ascites in a ten month old altatian dog, *African Journal of Biomedical Research*, **6**: 151-153.
- [15] Parthasarathy G. 1966. Study of serum protein pattern in canine health and in case of ascites. M.V.Sc. Thesis submitted to University of Madras.
- [16] Pradhan MS, Dakshinkar NP, Waghaye UG and Bodkhe AM. 2008. Successful treatment of Ascites of hepatic origin in Dog, *Veterinary World*, **1**(1):23.
- [17] Pathak D, Bansal N, Gupta K, Kumar A and Sood NK. 2012. Hepatocellular Carcinoma in a dog, *Indian Veterinary Journal*, **89**(3): 94.
- [18] Runyon BA, Montano AA and Akriviadis EA. 1992. The serum- ascites albumin gradient is superior to the exudates-transudate concept in the differential diagnosis of ascites, *Annals of Internal Medicine*, **117**(3): 215-220.
- [19] Routray AK, Patra RC, Parida GS, Sardar KK and Das S. 2010. Therapeutic Management of Ascites associated with Hepatitis in Dog, *Intas Polivet*, **11**:378-379.
- [20] Saravanan M, Sarma K, Kumar M, Vijaykumar H and Mondal DB. 2012. Analysis of serum ascites albumin gradient test in ascitic dogs, *Veterinary World*, **5**(5): 285-287.
- [21] Saravanan M, Mondal DB, Sarma K, Mahendran K, Vijayakumar H and Sasikala V. 2014. Comprehensive Study of Haematobiochemical, Ascitic Fluid Analysis and Ultrasonography in the Diagnosis of Ascites Due to Hepatobiliary Disorders in Dog, *Indian Journal of Animal Sciences*, **84**(5): 503-506.
- [22] Sevelius E. 1995. Diagnosis and prognosis of chronic hepatitis and cirrhosis in dogs, *Journal of Small Animal Practice*, **36**(12):521-528.
- [23] Smith KR. 1994. Acquired caudal venacava occlusion and high protein ascites in a dog, *Journal of Small Animal Practice*, **35**: 261-265.
- [24] Speeti M, Jhantola M and Westermarck E. 1996. Subclinical versus clinical hepatitis in the Doberman: evaluation of changes in blood parameters, *Journal of Small Animal Practice*, **37**(10): 465-470.
- [25] Strombeck DR, Roger W and Gribble D. 1976. Chronic active hepatic disease in a dog, *Journal of American Veterinary Medical Association*, **169**(8) 802-804.
- [26] Turkar S, Randhawa CS and Uppal SK. 2009. Ascites associated with ancylostomiasis in a pup: A case report, *Intas Polivet*, **10**: 357-359.
- [27] Tyagi SP, Adarsha K, Varshney AC and Gupta VK. 2004. Ascites in dog due to hepatic neoplasm, *Intas Polivet*, **5**(1): 120-122.