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## Prevalence of ascites in and around tarai region of Uttarakhand

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### Abstract

The present study was aimed to identify the clinical prevalence of ascites among the canines in and around tarai region of Uttarakhand. History, overt clinical examinations, haemato-biochemical profile, radiography and ultrasonography were the main diagnostic tools employed for the detection of canine ascites. The study was carried out from January, 2015 to December, 2015. Based on hospital records, prevalence of ascites was 1.4% due to hepatopathy and total prevalence was 2.9%. Breed wise prevalence was higher in male Spitz dogs. Male dogs had higher prevalence than female dogs. Highest prevalence was observed in more than 5 years old dogs. Winter month was found to be more prone for ascites. Major clinical signs were abdominal distention followed by inappetence, pale mucous membrane, lethargy, respiratory distress, diarrhea, vomiting and limb edema.

**Keywords:** Prevalence, canines, ascites, history, clinical signs, radiography, ultrasonography, hepatopathy, abdominal distention

### Introduction

Liver is the most important and metabolically active parenchymal organ in the body performing various function including protein, carbohydrate, fat, mineral and vitamin metabolism along with detoxification and immuno regulation. Liver accounts for approximately 3-8% of the whole body weight in the carnivores and occupies an important position in diverse metabolic activities that help in maintaining the body normal homeostatic mechanism<sup>[1, 2]</sup>.

Meyer (2005)<sup>[3]</sup> reported that Hepatobiliary diseases have an incidence of 2-3% among all animals presented at the companion animal's clinic. Hereditary portosystemic shunts, tumors (metastasis, malignant lymphoma and primary liver tumors) and chronic active hepatitis account for over 60% of these patients. Chronic hepatitis when progresses results in fibrosis which becomes irreversible causing cirrhosis followed by ascites<sup>[4]</sup>.

Hunt (2002)<sup>[5]</sup> stated that among the abdominal abnormalities of dogs, ascites is commonly found. The pathological accumulation of serous fluid in the abdomen (peritoneal cavity) and is generally reserved for a transudate that related to liver or right side coronary heart failure is termed as ascites<sup>[6]</sup>. The reduced oncotic stress due to hypoalbuminemia occurring due to protein losing enteropathy (PLE), protein losing nephropathy (PLN), liver failure (persistent Abdominal distension, respiratory distress, diarrhea and weight loss in PLE, polyuria/polydipsia in chronic renal disease, thrombo-embolic disease in PLE and PLN, jaundice in liver failure or bile peritonitis, exercise intolerance and collapse in heart failure and cardiac tamponade. anuria and uremia in uro-abdomen are the clinical signs directly associated with ascites and can be fatal if hemoperitoneum occurs<sup>[7, 8]</sup>.

Complete blood count, serum biochemical profile, urine analysis, faecal analysis, survey of abdominal radiography<sup>[9]</sup> and ultrasonography<sup>[10]</sup> are considered for screening purpose interestingly, some liver diseases are characterized by subtle changes in liver enzyme activity with normal functional indices, thus complicating the diagnosis. Although in India, prevalence of ascites in canines from pup hood to old age is noticed and is associated with high mortality rate but scientific literature available on this subject is meager and requires systemic work on the prevalence status, diagnosis and management aspects.

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## Materials and Methods

A total 1267 dogs were brought to the Teaching Veterinary Clinical Complex, Pantnagar during the study period i.e. January, 2015 to December, 2015 for various diseases. All the dogs were put through preliminary screening for the presence of ascites. It consisted of history taking, recording of temperature, pulse, respiratory rate, heart rate and level of dehydration. Dogs showing clinical signs of distended abdomen, decreased appetite, lethargy, vomiting, diarrhea, melena, weight loss and mild jaundice, were subjected to thorough clinical examination including detailed physical and clinical investigation with special reference to haemato-biochemical estimation, ultrasonography and radiography.

### Blood collection and storage

About 5.0 ml of venous blood sample was collected by dry disposable syringe through saphenous or cephalic vein from each dog, Immediately after collection about 2.0 ml blood was transferred to EDTA (@1.5 mg/ml) vials for complete blood count (CBC) that was carried out within four hours of collection. Left over, 3.0 ml of blood was transferred in to a clean and dry test tube without any anticoagulant and was allowed to clot in slanting position for about one hour and then separated serum was collected gently after centrifugation for 5 minutes at 3,000 rpm. The supernatant serum was collected carefully in a dry Eppendorf tube with the help of micropipette and finally the well labelled sera samples were preserved at -20°C in a deep freeze for further biochemical and serological estimation.

### Diagnosis

#### Clinical signs

All the 18 dogs showed abdominal distension and fluid thrill on percussion followed by clinical signs (Table 4 and Fig. 4) such as inappetance (15/18), pale mucous membrane (14/18), lethargy (14/18), respiratory distress (8/18), diarrhea (5/18), vomiting (4/18) and limb edema (1/18). Clinical findings in respect to the rectal temperature, heart rate, pulse rate and

respiration rate were found within the normal range in all the dogs. Lateral Radiographs of dogs were taken for confirming the presence of ascetic fluid. This included any abnormalities in the shape and size in the abdomen. Johnson (1992) [11] noticed that the abdominal radiographs were rarely useful in significant ascites beyond confirming the presence of fluid because the loss of abdominal contrast indistinct all details ("ground glass appearance") [12, 7] in dogs with micro-hepatic cirrhosis. Plain film radiograph was obtained using 60 mA mobile machines (Allengers Medical System Ltd, Chandigarh). Ultrasonography imaging of dogs selected on the basis of clinical signs was performed as per the procedure described by Nyland and Mattoon (2014) [13]. Ultrasonographic examination was carried out using 55D-6000-CD VET machine using multi hertz transducer (3.5 MHz) for scanning the abdominal region. For ultra-sonographic evaluation of liver, transducer was placed immediately behind the xiphisternum on the midline and slanting cranio-dorsally to image a transverse section of liver. Gradually transducer was moved caudally, remaining on the midline and transducer head rotated through 90 degree to image a longitudinal section of liver on midline. For right sided transverse image of the gall bladder, transducer placed on the right side approximately 6-8 cm cranial to xiphoid and 4-5 cm dorsal to the sternum. Transducer angled towards midline between costal cartilages. For left sided transverse image of the gall bladder, the transducer placed on right 10<sup>th</sup> – 11<sup>th</sup> inter costal space, 5-10 cm ventral to the spine.

### Results and Discussion

Out of these 1267 cases, 18 dogs were diagnosed to be suffering from ascites due to hepatic dysfunction suggesting over all prevalence of 1.4%. Out of 1267 cases, total 38 cases were diagnosed positive for ascites during study period. Of which 18 dogs were found to be suffering from ascites due to hepatopathy. Highest prevalence of ascites in dogs was found in winter months (November, December and January) as compared to other months [Table 1].

**Table 1:** Month wise prevalence of ascites due to hepatopathy in dogs

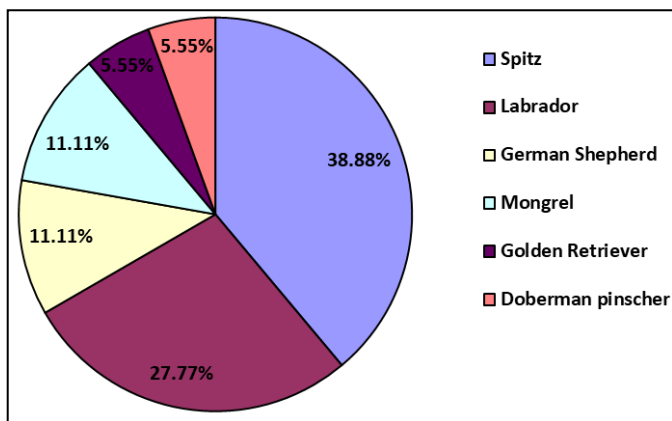
Month	Total No. of dog cases	Ascetic dogs	Ascites due to hepatopathy
January	107	7	4
February	95	2	1
March	105	1	0
April	110	4	2
May	95	3	2
June	104	1	0
July	115	0	0
August	82	1	1
September	111	2	1
October	107	3	1
November	119	6	2
December	117	8	4
Total	1267	38 (2.9%)	18 (1.4%)

Out of 18 cases of ascites, seven were in the dogs of breed Spitz showing highest prevalence of 38.88% among the breeds followed by five in Labrador retriever (27.77%), two

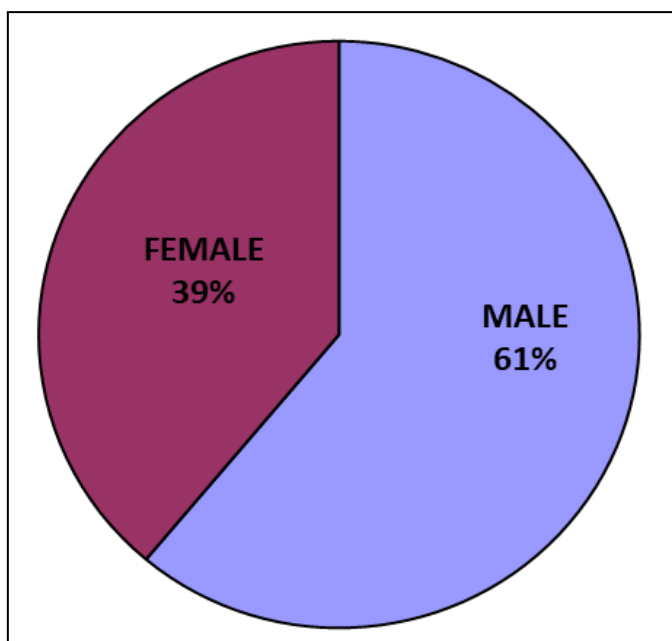
each of German shepherds and Mongrel (11.11%) and one each of Golden Retriever and Doberman pinscher (5.55%) [Table 2].

**Table 2:** Breed and sex wise distribution of ascites due to hepatopathy in dogs (n=18)

Breeds	Ascitic dogs (%)	Sex wise distribution	
		Male (%)	Female (%)
Spitz	7 (38.88)	4 (57.15)	3 (42.85)
Labrador Retriever	5 (27.77)	3 (60)	2 (40)
German Shepherd	2 (11.11)	1 (50)	1 (50)
Mongrel	2 (11.11)	2 (100)	0
Golden Retriever	1 (5.55)	1 (100)	0
Doberman Pinscher	1 (5.55)	0	1 (100)
Total	18	11 (61.11)	7 (38.89)



**Fig 1:** Breed-wise prevalence of ascites in dogs



**Fig 2:** Sex-wise prevalence of ascites in dogs

Male dogs revealed higher prevalence (61.11%) than females (38.89%). Breed wise higher prevalence was recorded in Spitz dogs for both male (57.17%) and female (42.85%) categories [Table 2].

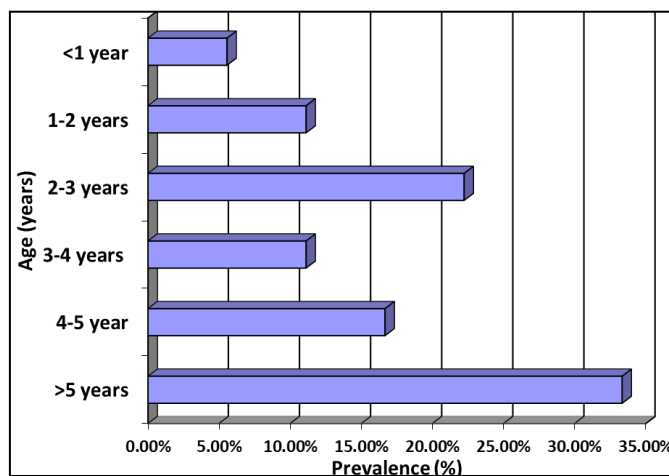
Saravanan *et al.* (2014) [14] also mentioned that overall sex wise distribution shows that male dogs (54.2%) had higher prevalence of ascites.

Dogs of different age groups were diagnosed to be suffering from ascites (Fig. 3). Only 1 dog belonged to the age group of less than 1 year (5.55%) whereas 2 were in the age group of

1-2 years (11.11%), 4 dogs in the age group of 2-3 years (22.22%), 2 in 3-4 years of age (11.11%), 3 dogs in 4-5 years age group (16.66%) whereas most of the ascites dogs (6) were in the age group of 5 years and above representing 33.33% [Table 2]. Male dogs of > 5 years of age (66.66%) had higher prevalence whereas females of 4-5 years of age (66.67%) had higher prevalence of ascites [Table 3].

**Table 3:** Age and sex wise distribution of ascites due to hepatopathy in dogs (n=18)

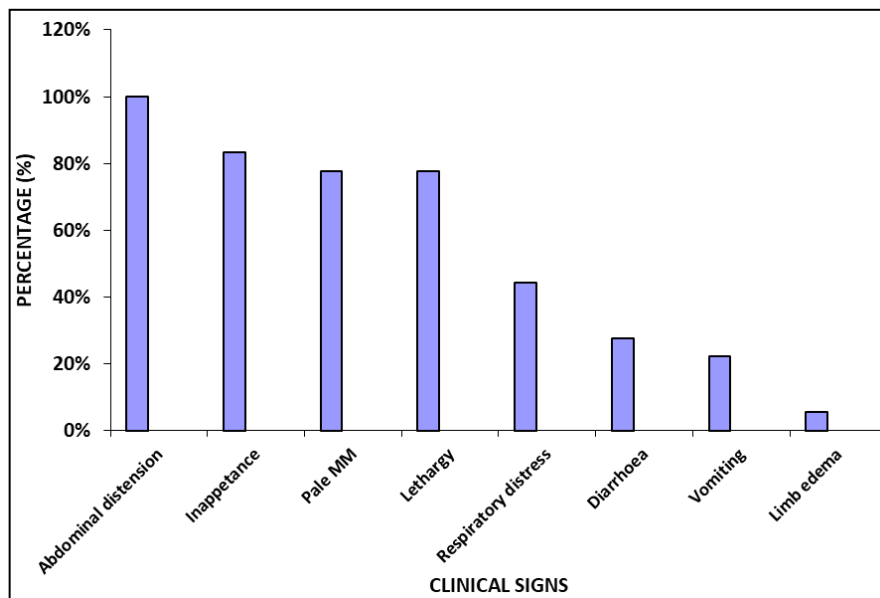
Age (years)	Ascitic dogs (%)	Sex wise distribution	
		Male (%)	Female (%)
< 1 year	1 (5.55)	0	1 (100)
1-2 years	2 (11.11)	1 (50)	1 (50)
2-3 years	4 (22.22)	4 (100)	0
3-4 years	2 (11.11)	1 (50)	1 (50)
4-5 years	3 (16.66)	1 (33.33)	2 (66.67)
>5 years	6 (33.33)	4 (66.66)	2 (33.34)
Total	18	11 (61.11)	7 (38.89)



**Fig 3:** Age-wise prevalence of ascites in dogs

**Table 4:** Common clinical signs recorded in ascetic dogs

Clinical signs	No. of cases (n = 18)	Percentage (%)
Abdominal distension	18	100
Inappetance	15	83.33
Pale mucus membrane	14	77.77
Lethargy	14	77.77
Respiratory distress	8	44.44
Diarrhoea	5	27.77
Vomiting	4	22.22
Limb oedema	15.56	15.56



**Fig 4:** Various clinical signs observed in ascetic dogs

### Conclusion

From the present study, it was concluded that the overall prevalence of ascites due to hepatopathy was 1.4% in dogs in and around tarai region of Uttarakhand region during the study period. Breed wise prevalence of ascites was high with male Spitz dogs followed by Labrador and German shepherd particularly in dogs which were more than 5 years of age. Winter season found to be most prone for ascites and clinical signs like abdominal distention, pale mucous membrane, lethargy, vomiting, diarrhea, inappetance, respiratory distress and limb edema were commonly observed. Clinical signs are recorded in the present study were similar to the observations of other workers who recognized that the clinical signs such as abdominal distension and respiratory distress occur due to presences of massive fluid accumulation [7, 14]. Decreased appetite, vomiting, diarrhea, anemia and polyuria/polydipsia are seen [4, 10, 15]. Clinical signs are highly variable and commonly related to gastrointestinal and neurological symptoms [16]. The commonly found symptoms in ascites associated with hepatic dysfunction depend on the etiology and extent of liver damage [17]. Cold weather might interrupt the immune system while supporting the proliferation of pathogens, which then take advantage of the weakened immune status to invade and cause septicemia in the host [18].

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