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Occurrence of ascites in dogs

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Abstract
Study on occurrence of ascites was conducted in Jabalpur region of Madhya Pradesh. The occurrence of abdominal distension in dog population was found to be 3.97%. The overall occurrence of ascites was reported as 0.68% in the dog population. The highest occurrence of ascites 6.89% was recorded in the dogs of 6-9 years age and lowest in less than 1 year age of dogs. The breed wise highest occurrence of ascites was recorded in the Labrador breed (6.89%) of dogs.

Keywords: Ascites, abdominal distension, dogs, occurrence

1. Introduction
Ascites is referred as accumulation of serous fluid in peritoneal cavity, has been attributed to chronic hepatic failure, congestive heart failure, nephritic syndrome, malnutrition and protein losing enteropathy in canines. It results in abdominal swelling, dyspnea, lethargy, anorexia, vomition, weakness and discomfort (Regmi and Shah, 2017) [11]. However, recent evidences contradict these theories and suggest that renal mechanism leading to retention of sodium and water are primary events in development of ascites in hepatic diseases. Reduced albumin levels also contribute to onset of ascites (Richter, 1996) [12]. The variable pattern of occurrence has been recorded by different workers throughout the country. Hence, the present study was conducted to know the occurrence of ascites in dog population in Jabalpur region of Madhya Pradesh.

2. Materials and Methods
For the occurrence study, the dog population (irrespective of age, breed and sex) referred to Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Jabalpur, Madhya Pradesh was included. However, the dog population having abdominal distension was examined physically (tactile percussion) for confirmation of ascitic fluid or fluid thrill in abdominal cavity.

2.1 Statistical Analysis
For this study chi square test was performed on IBM-SPSS-24 Software.

3. Results and Discussion
For this purpose a total 4372 dogs (2947 male and 1425 female dogs, irrespective of age, breeds and sex) presented at Veterinary Clinical Complex (VCC), College of Veterinary Science & Animal Husbandry, N.D.V.S.U., Jabalpur, Madhya Pradesh, from September, 2019 to March, 2020 were screened. Among dog population, 174 suspected dogs (abdominal distension) were subjected to thorough investigation for confirmation of the ascites.

3.1 Occurrence of abdominal distension in dog population
The occurrence of abdominal distension was reported as 3.97% (174/4372) in the dog population. However, higher occurrence was reported in female (3.47%) as compared to male (0.50%). Results are shown in table 01 and figure 01.
This may be due to owners were more concerned about the abdominal distension of female dogs because of pregnancy.

Table 1: Occurrence of abdominal distension in dog population

Particulars	No. of Dogs	Case of abdominal distension	Occurrence (%)
Male	2947	22	0.50
Female	1425	152	3.47
Total	4372	174	3.97
χ^2 = 247.3543 *p*-value is < 0.00001 Significant at *p*<0.05			

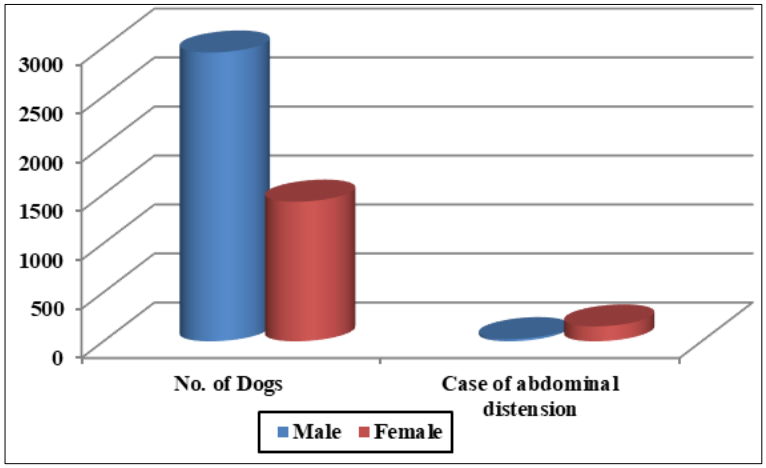

Fig 1: Occurrence of abdominal distension in dog population

3.2 Distribution of cases of abdominal distension in suspected dogs

The distribution of cases of abdominal distension was the highest in pregnancy cases (64.94%) followed by ascites (17.24%), pyometra (12.14%) and equally in obesity (2.87%) and pot bellied (2.87%).

Table 2: Distribution of cases of abdominal distension in suspected dogs

(n=174)

Clinical condition	No. of cases	Distribution (%)
Ascites	30	17.24
Obesity	05	02.87
Pot bellied	05	02.87
Pregnancy	113	64.94
Pyometra	21	12.06

Abdominal distention can be caused by various disorders in the abdomen and abdominal organs such as pyometra, pot belly, obesity, trauma, tumors etc. whereas pregnancy is the most common physiological finding of abdominal distension in dog population.

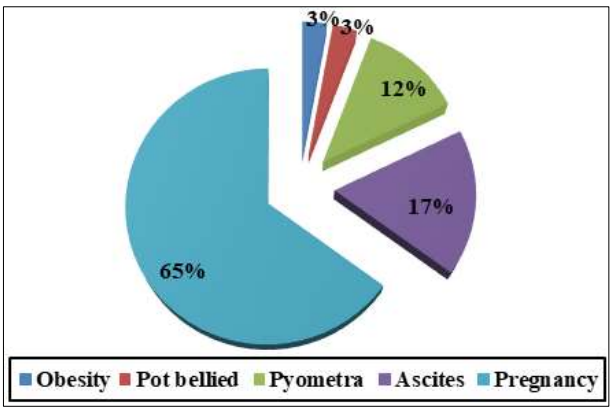

Fig 2: Distribution of cases of abdominal distension in suspected dogs

Our findings of obesity in dogs are in accordance to Lund *et al.* (2006) [5] who reported prevalence of obesity in canine. The reason attributable to the occurrence of pot bellied abdomen might be due to lack of de-worming awareness of the owners. Other studies in canine have found relationships of canine obesity with cardiovascular and hepatic problems which may have lead to ascites.

3.3 Overall occurrence of ascites in dog population

The overall occurrence of ascites was reported as 0.68% (30/4372) in the dog population. However, equal occurrence was reported in female (0.34%) as compared to male (0.34%).

Table 3: Overall occurrence of ascites of dog population

Particulars	No. of Dogs	Case of ascites	Occurrence (%)
Male	2947	15	0.34
Female	1425	15	0.34
Total	4372	30	0.68
χ^2 = 4.1657 *p*-value = 0.041251			

Results of the present study resemble to the total incidence of ascites with earlier communication Dixit (2012) [3] was 0.62%; Behera *et al.* (2017) [1] was 0.59% and in our contrary Phom *et al.* (2019) [9] reported 1.9% incidence and Singh *et al.* (2019) [16] reported 2.9% prevalence of ascites. No rational explanation could be offered, at present, to reconcile the apparently conflicting reports.

3.4 Occurrence of ascites in cases of abdominal distension

The overall occurrence of ascites was reported from cases of abdominal distension was 17.24% (30/174). Gender wise occurrence of canine ascites was equal in male (8.62%) and in female dogs (8.62%) among cases of abdominal distension.

Table 4: Occurrence of ascites in cases of abdominal distension

Particulars	Case of abdominal distension	Case of ascites	Occurrence (%)
Male	22	15	08.62
Female	152	15	08.62
Total	174	30	17.24
χ^2= 45.8003 *p*-value = < 0.00001			

Our findings are contrary to Strombeck *et al*. (1976) [19], Crawford *et al*. (1985) [2], Speeti *et al*. (1996) [17], Ogbe *et al.* (2003) [7], Pradhan *et al*. (2008) [10] and Routray *et al*. (2010) [13] who reported higher incidence of ascites in female dogs as compared to male dogs. Saravanan *et al.* (2013) [14] reported higher occurrence in males (60%).

3.5 Age wise occurrence of ascites in dogs

The highest occurrence of ascites 6.89% was recorded in the dogs of 6-9 years age, followed by 4.59% in 1-3 years, 2.87% in 3-6 years age, 1.72% in more than 9 years and 1.49% in less than 1 year age of dogs.

Table 5: Age wise occurrence of ascites (n=174)

Age groups (years)	Screened	Affected	Occurrence (%)
<1	14	02	1.49
1 to 3	36	08	4.59
3 to 6	47	05	2.87
6 to 9	45	12	6.89
>9	32	03	1.72
χ^2 =6.3372 *p*-value = 0.175339			

The present findings are similar with Dixit (2012) [3]; Saravanan *et al.* (2012 and 2013) [15, 14]; Behera *et al*. (2017) [1] and Ogechi *et al.* (2019) [8]. According to their study the age wise 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 and kidney) damage or failure that responses to ascites are expected to occur more in older than younger animals except where the organ failure is congenital. However, Nottidge *et al*. (2003) [6]; James *et al*. (2008) [4] and Turker *et al*. (2009) [22] reported higher incidence of ascites in younger age group which is contrary to present study.

3.6 Breed wise occurrence of ascites

The highest occurrence of ascites, 6.89% was recorded in the Labrador breed of dogs, followed by 3.44% in the Non descript, 2.29% in the German shepherd breeds, followed by Indian spitz, Golden retriever, Beagle, Cocker spaniel and Great dane.

Table 6: Breed wise occurrence of ascites

(n=174)

Breed	Screened	Affected	Occurrence (%)
Beagle	13	02	1.14
Cocker spaniel	04	01	0.57
German shepherd	41	04	2.29
Golden retriever	09	02	1.14
Great dane	07	01	0.57
Indian spitz	27	02	1.14
Labrador retriever	64	12	6.89
Non descript	09	06	3.44

Our findings resemble with earlier communication of Behera *et al*. (2017) [1]. They found higher prevalence 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%). However, Upadhyay (2007) [23] recorded highest in Doberman breed (33.33%); Saravanan *et al.* (2013) [14] in Pomeranian breed; Singh *et al.* (2019) [16] found maximum prevalence in Indian Spitz breeds (38.88%). This also might be due to higher preference of dog owner for keeping Labrador breed in Jabalpur.

4. Conclusion

The overall occurrence of ascites was reported as 0.68% in the dog population. The highest occurrence of ascites 6.89% was recorded in the dogs of 6-9 years age and lowest in less than 1 year age of dogs. The breed wise highest occurrence of ascites was recorded in the Labrador breed (6.89%) of dogs.

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