



Incidence of Pancreatitis Among Dogs in Hyderabad

Ranjith Kumar Sandepogu¹, Ambica Gadige², Lakshmi Kosapati³ and Anil Kumar Banothu³

¹Dept. of Animal Husbandry, ²Dept. of Veterinary Clinical Complex, ³Dept. of Veterinary Pharmacology and Toxicology, College of Veterinary Science, P.V. Narsimha Rao Telangana Veterinary University (PVNRTVU), Rajendranagar, Hyderabad, Telangana (500 030), India



Corresponding  gadigeambica@gmail.com

 0000-0002-8848-1341

ABSTRACT

The experiment was conducted from September, 2020 to January, 2021 to study the incidence of canine pancreatitis. The present investigation was undertaken with the primary objective of assessing the occurrence of pancreatitis in dogs and evaluating the comparative effectiveness of two therapeutic regimens in affected animals. A total of 36 dogs showing clinical signs suggestive of pancreatitis were initially screened using the SNAP cPL test kit, which is considered a reliable diagnostic tool for detecting pancreatic lipase levels. Dogs that tested positive were subsequently subjected to detailed diagnostic workups, including complete hematological examination, serum biochemical profiling, and abdominal ultrasonography. In cases where surgical intervention was performed, histopathological evaluation of the pancreas was also carried out to establish a confirmatory diagnosis. Out of the 36 suspected cases, 12 were confirmed to be suffering from pancreatitis, yielding an overall incidence rate of 33.33% in the study population. The distribution of incidence across age groups revealed that older dogs, particularly those above seven years of age, were most frequently affected, accounting for 58.34% of cases. This was followed by dogs in the age range of 2–7 years (33.33%), while younger dogs between 1–2 years showed a lower incidence of 8.33%. Interestingly, no cases were recorded in puppies less than one year of age. Breed-wise analysis demonstrated a higher predisposition in German Shepherds (41.67%), while Pomeranians (25.00%), Golden Retrievers (16.67%), Rottweilers (8.33%), and Dobermanns (8.33%) showed comparatively lower incidences. Sex-wise distribution indicated a greater prevalence in male dogs (66.67%) as compared to females (33.33%), suggesting possible sex-related predisposition factors.

KEYWORDS: Dogs, pancreatitis, incidence, age-wise, breed-wise, ultrasonography, histopathology and sex-wise

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Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, author 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

The pancreas is a flat, elongated glandular organ situated within the abdominal cavity, extending between the duodenum on the right and the spleen on the left. Anatomically, it consists of two distinct lobes-right and left-connected by a narrow central body. The right lobe lies in close association with the proximal duodenum, while the left lobe extends toward the spleen, forming an integral part of the digestive system (Skerritt, 2022). Functionally, the pancreas serves as both an endocrine and exocrine organ, with specialized cells dedicated to each function. The endocrine component of the pancreas is organized into discrete clusters known as the islets of Langerhans, which comprise only about 1–2% of the total pancreatic mass (Bakhti et al., 2019). Despite their small proportion, these islets play a crucial role in metabolic homeostasis by secreting hormones such as insulin, glucagon, somatostatin, and pancreatic polypeptide. These hormones collectively regulate blood glucose levels and contribute to lipid and protein metabolism, maintaining the body's energy balance. In contrast, the exocrine pancreas constitutes the majority of the organ and is primarily responsible for the production, storage, and secretion of digestive enzymes (Malik et al., 2023). These enzymes-such as amylase, lipase, and proteases-are essential for the breakdown of carbohydrates, fats, and proteins within the small intestine. They are secreted into the duodenum through the pancreatic duct in an inactive form to prevent autodigestion of the pancreatic tissue. Pancreatitis refers to inflammation of the exocrine pancreatic tissue, characterized by infiltration of inflammatory cells, interstitial edema, and damage mediated by prematurely activated pancreatic enzymes. In dogs, pancreatitis represents a significant yet often underdiagnosed condition encountered in small animal practice (Watson et al., 2007). The actual prevalence is difficult to estimate but has been reported at approximately 3.2% (Cridge, 2022). The disease develops when digestive enzymes such as trypsinogen are inappropriately activated within the pancreatic parenchyma rather than the intestinal lumen, leading to self-digestion and inflammation (Hoeyrup et al., 2021). Clinically, pancreatitis is categorized into acute and chronic forms, both of which are multifactorial in origin. The severity of the disease can range from mild, self-limiting episodes to severe, life-threatening conditions with systemic complications (Bashir et al., 2023). Factors contributing to the development of pancreatitis include high-fat diets, obesity, certain drugs, trauma, endocrine disorders, and idiopathic causes. In canine patients, exocrine pancreatic diseases are becoming increasingly recognized as important causes of gastrointestinal and metabolic disturbances. When pancreatic enzyme secretion is impaired, digestion and nutrient absorption are compromised, leading to

malnutrition, weight loss, and deficiencies in essential nutrients. Repeated or chronic inflammation may result in irreversible structural damage to the pancreas, with progressive loss of both exocrine and endocrine functions, culminating in chronic pancreatitis (Kunovsky et al., 2021). Other diseases, such as cystic fibrosis, severe necrotizing pancreatitis, pancreatic cancer, and chronic inflammatory conditions, can also result in exocrine pancreatic insufficiency. The pancreas possesses a large functional reserve capacity, and clinical signs of insufficiency generally appear only when more than 80–90% of the functional tissue is lost (Karpinska and Czauderna, 2022). In dogs, acute pancreatitis is reported more commonly than the chronic form. However, patients with chronic pancreatitis may experience multiple relapses, complications such as diabetes mellitus, and concurrent hepatic or intestinal disorders. These comorbidities can significantly affect both the outcome and long-term prognosis (Rudinsky, 2023). Understanding the pathophysiology and clinical implications of pancreatic diseases is therefore crucial for effective diagnosis, management, and prevention in veterinary practice.

2. MATERIALS AND METHODS

The present study was carried out to study the incidence of canine pancreatitis. The clinical cases that were brought to the Veterinary Clinical Complex, Campus Hospital, and Veterinary Hospital, Bhoiguda, College of Veterinary Science, Rajendranagar, Hyderabad, during the period of September, 2020 to January, 2021 were screened for pancreatitis. In addition, referral cases from the practicing veterinarians in and around Hyderabad and adjoining areas were also included. A detailed history of the individual animal with respect of age, sex, breed and onset of clinical signs was recorded and furnished in a score sheet designed for the present study. Clinical examination of all the affected as well as healthy control dogs was carried out to evaluate rectal temperature, pain score and level of dehydration. Dogs suspected of pancreatitis were screened with the SNAP cPL test kit, and positive cases were further evaluated for complete blood analysis, serum biochemistry ultrasonography, and histopathology in cases that underwent surgical intervention for the confirmatory diagnosis. The 12 positive cases of pancreatitis were randomly divided into 2 groups of 6 dogs in each and given two different therapeutic regimen to test the efficacy.

The incidence was calculated by the formula given by Park and Park (1991).

Incidence %=(No. of positive cases/Total no. of cases screened)×100

3. RESULTS AND DISCUSSION

In the present study, out of the total 36 dogs presented to the above-mentioned hospitals during the period from September, 2020 to January, 2021, with the history of dyspepsia, vomiting, weight loss, diarrhea, abdominal pain and dehydration were selected for the present investigation. Out of them, 12 dogs were diagnosed as positive for canine pancreatitis after the SNAP Cp Ltest and haemato-biochemical tests, indicating an incidence rate of 33.33%.

The age-wise incidence out of 12 positive cases of pancreatitis was categorized as less than 1, 1-2, 2-7, and more than 7 years and each group comprised 0, 1, 4 and 7 dogs with the corresponding incidence of 0%, 8.33%, 33.33%, and 58.34%, respectively. The results were furnished in Table 1 and Figure 1.

Table 1: Age-wise incidence of pancreatitis in dogs

Sl. No.	Category	Age	No. of dogs	Percentage
1.	Puppy	0-1 year	0	0%
2.	Young adult	1-2 years	1	8.33%
3.	Adult	2-7 years	4	33.33%
4.	Old dog	> 7 years	7	58.34%

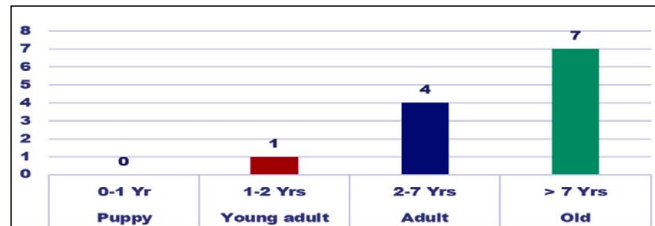


Figure 1: Age-wise incidence of pancreatitis in dogs

The breed-wise incidence out of 12 positive cases, 5 German shepherds, 3 Pomeranians, 2 Golden Retrievers, 1 Rottweiler, and 1 Doberman were affected, giving the corresponding breed-wise incidence rate of 41.67%, 25.00%, 16.67%, 8.33% and 8.33%, respectively. The findings were furnished in Table 2 and Figure 2.

The sex wise incidence out of 12 positive cases, 8 (66.67%) were found to be males and 4 (33.33%) were females. The results were furnished in Table 3 and Figure 3.

In the present study, the overall incidence of pancreatitis among the 36 suspected cases was reported to be 33.33%. These findings are in accordance with those who reported incidence rates of 34% and 35%, respectively. (Abhilaasha et al., 2020). However, 46.5% and 7.69% of the incidence of pancreatitis in dogs were recorded, respectively. (Hardwick et al., 2022).

Ultrasonographic examination revealed pancreatic

Table 2: Breed-wise incidence of pancreatitis in dogs

Sl. No.	Breed	No. of dogs	Percentage
1.	German shepherd	5	41.67%
2.	Pomeranian	3	25.00%
3.	Golden retriever	2	16.67%
4.	Rottweiler	1	8.33%
5.	Doberman	1	8.33%

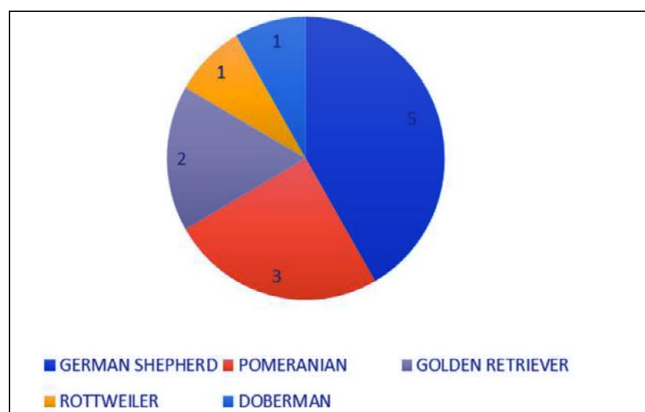


Figure 2: Breed-wise incidence of pancreatitis in dogs

Table 3: Sex-wise incidence of pancreatitis in dogs

Sl. No.	Sex	No. of animals	Percentage
1.	Male	8	66.67%
2.	Female	4	33.33%

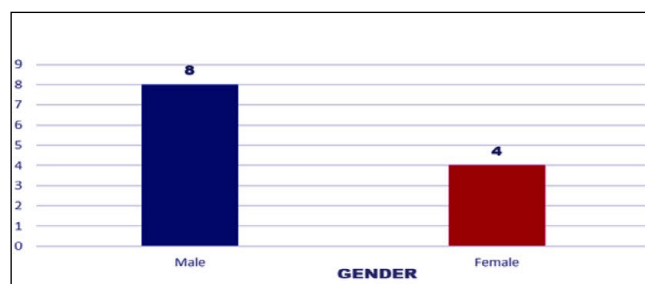


Figure 3: Sex-wise incidence of pancreatitis in dogs

changes in 5 dogs (41.66%). Among these, three dogs had hypoechoic pancreas surrounded by hyperechoic mesentery caudal to the duodenum (Figure 4), while two dogs had hyper echoic enlarged pancreas with an irregular border in duodenal loop (Figure 5), Histopathology of the pancreatic biopsy sample collected from the dog underwent surgery has showed pancreatic acini of normal histology amidst which was decreased beta cell density (Figure 6).

In the current study, among the 12 pancreatitis-positive dogs, age-wise incidence was categorized as puppy category (0-1 year), young adults (1-2 years), adults (2-7 years), and

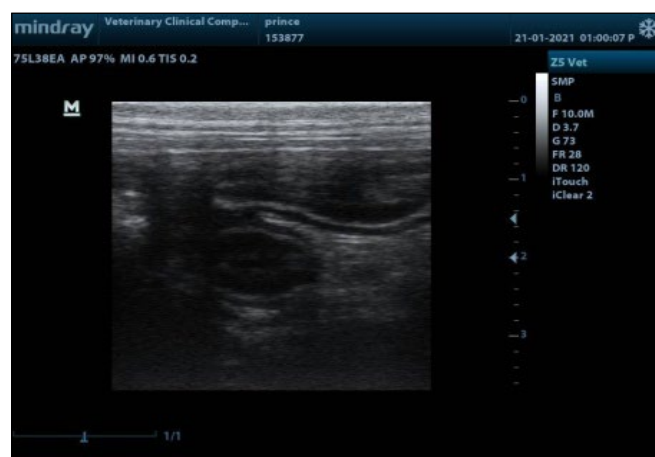


Figure 4: Ultrasonographic findings of pancreatitis affected dog showing hyper echoic pancreas surrounded by hyper echoic mesentery caudal to the duodenum

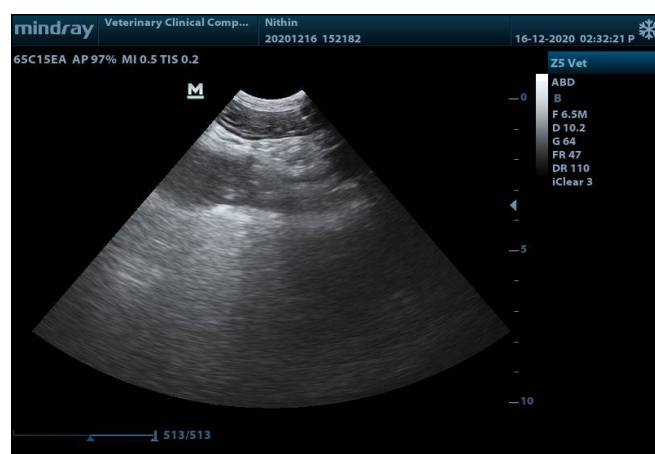


Figure 5: Ultrasonographic findings of pancreatitis affected dog showing hyper echoic enlarged pancreas with an irregular border in duodenal loop

old dogs (>7 years). The age of the dogs ranged from 1 to 11 years. The majority of the cases (7) consisted of dogs more than 7 years old (58.37%) of age. 4 of the dogs were adults (33.33%) and one dog was between 1 and 2 years (8.33%), as outlined in Table 1 and Figure 1. A similar finding of a higher incidence of pancreatitis in dogs older than 7 years was recorded (Cridge et al., 2022). However, a higher incidence of pancreatitis was recorded in 4-6 years of age (66.66%) and followed by 7-9 years (33.33%) in their experimentally conducted diagnosis among 12 dogs (Ravi et al., 2017). Lee et al. (2023) demonstrated that dogs with acute pancreatitis had a significantly higher mean age (10.7 ± 4.1 years) compared with healthy controls (6.0 ± 2.8 years), suggesting that advanced age increases susceptibility to pancreatic inflammation. Pancreatitis is typically noticed in middle-aged to older patients and could be due to being overweight or having a history of dietary indiscretion (Möller et al., 2023).

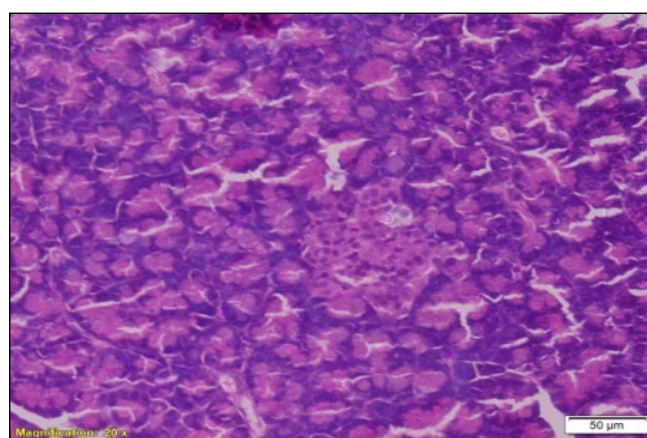


Figure 6: Histopathology of pancreas showing decreased beta cell density in pancreatitis affected dog

The breed-wise incidence of pancreatitis in dogs revealed that the German Shepherds (5) are the breeds with the highest incidence, followed by Pomeranians (3), Golden Retriever (2) and one each of Rottweiler (1) and Doberman (1) as depicted in Table 2 and Figure 2. According to the present findings, the predominant breed affected with acute pancreatitis is the German Shepherd, which is in agreement with the reports [17]. However, the miniature schnauzer and Terrier breeds are at an increased risk of pancreatitis [18]. These different findings of pancreatitis in different breeds could be attributed to the diet composition and feeding habits.

On perusal of Table 3 and Figure 3, in the present study, sex-wise incidence indicated that the occurrence of pancreatitis was more in male dogs (66.67%) than in females (33.33%). This is in collaboration with the findings that males had an increased risk of developing pancreatitis compared to sexually intact females. In contrast to this higher incidence of pancreatitis in females when compared to males, as 58.33% and 41.6%, respectively.

Among the five dogs with ultrasonographic pancreatic changes, three of the dogs had hypoechoic pancreas surrounded by hyperechoic mesentery caudal to the duodenum while two dogs had hyper echoic enlarged pancreas with an irregular border in duodenal loop. Similarly, Kumar et al. (2010) reported the mixed echogenicity in pancreatic stroma along with thickened duodenal wall in chronic pancreatitis cases. However, Larson (2016) observed that in the dog, the right lobe seems to be the most commonly affected portion of the pancreas in acute disease, which may be related to the fact that the right limb is more easily identified on ultrasound.

Histopathological examination of the biopsy sample of pancreatic section from the pancreatitis affected dog which underwent surgery has revealed pancreatic acini of normal histology amidst which was decreased beta cell density.

One of the most common grossly apparent manifestations of macroscopic pancreatitis in a study conducted by Steiner et al. (2008) was peripancreatic fat necrosis revealed by presence of saponified fat. Whereas, interspersed areas with fibrosis and focal congestion were reported by Trivedi et al. (2011) in a study on 70 dogs, among which 12 had macroscopic evidence of pancreatitis at necropsy, including haemorrhage, edema, pancreatic nodules/plaques, a firm pancreas, hyperaemia, pancreatic necrosis and peripancreatic fat necrosis.

4. CONCLUSION

The investigation revealed that pancreatitis was a clinically significant condition in dogs, with an overall incidence of 33.33% among the suspected cases examined. The condition occurred more frequently in older dogs, particularly those above seven years of age, and was common in breeds such as German Shepherds and Pomeranians. A clear male predisposition was noted. The findings highlighted the importance of early diagnosis using SNAP cPL testing, imaging, and histopathology to ensure effective management and improved clinical outcomes.

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