UDC 619:616.37 https://doi.org/10.31548/ujvs2019.04.018

PREVALENCE OF PANCREATIC PATHOLOGY IN DOG

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Abstract. *The article presents the results of the study of the prevalence of pancreatic diseases among dogs in Kyiv. Was studied the history disease of 5075 dogs showed that more than 90 % of the cases of non-infectious etiology are. It has been established that diseases of the digestive system in general make up 20,3 % of the total non-infectious pathology and occupy the third place in the frequency of occurrence after diseases of the skin and the cardiovascular system. It is determined that among the diseases of the digestive system in dogs the most frequent occurrence of intestinal diseases – 31, 5 %); the second place is occupied by diseases of the pancreas – 28, 6 %; in third place were liver and gall bladder diseases, which were diagnosed in 27,5 %. A total of 10,3 % animals had gastric diseases and 2,1 % had esophageal diseases. Among them, the main place belongs to the inflammatory disease of the pancreas of inflammatory genesis, which make up 28,6 among pathologies of the digestive system and 94,6 % among pancreatic pathologies in general. Thus, inflammation of the pancreas in dogs is 94,6 % of the total number of pathologies of this organ. Analyzing the above, it can be argued that every 17 animals in Kyiv suffer from pancreatitis. Given the lack of objective diagnostic criteria for pancreatitis in dogs, the difficulty in verifying the diagnosis and frequent pancreatitis, together with related diseases, can be assumed that the data obtained are underestimated.*

Keywords: *pancreatitis, dogs, non-invasive pathology, gallstone-related diseases, pancreas.*

Introduction

The term "pancreatitis" combines a group of pancreatic diseases of various etiologies (Lee & Enns, 2007), mainly inflammatory genesis with phase-progressive focal, segmental or diffusely degenerative, destructive changes of its exocrine part; atrophy of glandular elements (pancreas) and replacement of their connective (fibrous) tissue; changes in the duct system of the pancreas and with varying degrees of disruption of the exocrine and endocrine functions (Xenoulis, 2015). It should be noted the high and increasing incidence of this pathology among domestic animals.

In most animals with spontaneous pancreatitis, the cause of the disease is difficult to identify, and the pathogenesis

is poorly defined. Based on clinical data found in natural cases and on the basis of various experimental models of pancreatitis, the following causes are indicated as etiological or predisposing factors: nutrition, hyperlipidemia, reflux of duodenal contents, obstruction of the pancreatic duct or papilla, biliary tract disease, gastrointestinal disease, infection, hypercalcemia, hyperstimulation, idiosyncratic drug reaction, zinc toxicosis, pancreatic trauma, pancreatic ischemia, genetic predposition (Sherding, 2006).

The severity of changes in pancreatic symptoms can be moderate (edematous pancreatitis) or severe and even threaten the life of the animal (hemorrhagic pancreatic necrosis). A variety of clinical manifestations are associated with metabolic disorders and secretion of toxic enzymes, as well as involvement in the pathological process of the gastrointestinal tract, liver and kidneys (Rahmoun Djallal Eddine & Fares Mohamed Amine, 2018).

The inflammatory process in the pancreas is usually sterile, but the etiology and pathogenesis of those disease remain understudied. Acute form is usually associated with high lethality, but also the possibility of a complete restoration of the structure and function of the organ if the animal survives. Chronic pancreatitis can cause refractory pain and reduce the quality of life of the animal. It can also lead to progressive exocrine and endocrine functional impairments. In veterinary literature there is confusion with the definitions of acute and chronic pancreatitis, and very little research on pathophysiology found in nature pancreatitis (Watson, 2015).

Pancreatitis dogs may be underestimated due to the low, non-specific nature of clinical traits and the difficulty of early diagnosis using non-invasive methods. The final diagnosis is based on pancreatic histology, and for this reason previous studies of prevalence on dogs have focused on an acute, usually fatal disease in which postmortem histology is available pancreas (Newman et al., 2005). Consequently, the true prevalence of pancreatitis in dogs in the practice of the doctor is completely unknown (Watson, 2007; Watson, 2010; Watson, 2015).

Polyetiology, pathogenetic heterogeneity and progressive nature of pancreatitis in dogs determine the relevance of timely diagnosis questions (Gori et al., 2019; Zhan et al., 2016). It is believed that many dogs have pancreatitis with non-typical clinical signs, some animals have symptoms that are usually not associated with pancreatitis, while others identify typical signs such as pain and dyspeptic syndromes (French et al., 2019; Maier et al., 2019).

According to published data, mortality in dogs with acute complicated pancreatitis ranges from 27 % to 42 % (Nesterenko, 2004).

However, as the literature data show, in a number of cases significant difficulties may arise both in diagnosis, due to the uncertainty of the medical history data received from the owner and the nonspecificity of symptoms, and in the treatment of this pathology. Until now, questions of pathogenesis and diagnosis have not been completely resolved; there is no consensus on the tactics of treating acute pancreatitis, especially acute edematous form with the subsequent development of pan-creonecrosis. Many authors recommend that, in cases of suspected acute pancreatitis, be safe and start intensive treatment immediately, because in the case of a diagnostic error it will not hurt, and being late with the appointment of therapy will not save the patient's life (Bondarevskaya, 2008).

The true prevalence of pancreatitis in dogs is unknown. Conducting studies in which the diagnostic standard is the histopathological examination of pancreatic tissue, carried out or shown only in rare cases, is not easy. The sensitivity and specificity of all other diagnostic methods is below 100 %. Veterinary surgeons diagnose and treat acute pancreatitis in dogs in their practice quite often, so the disease can be considered relatively common. In publications, the frequency of detection of acute pancreatitis is usually described only for deaths (in which there is histopathological evidence), therefore, these observations are subject to systematic error.

The aim of the investigation was to analyze the prevalence of diseases of the digestive system among dogs in Kyiv in general and pancreatitis in particular.

Materials and methods of research

The research used data obtained from clinical disease histories of 5075 dogs with different breeds and age groups. Analyzed diagnosis data during 2017–2018 received in clinics of veterinary medicine in Kyiv, namely the Solomenskiy, Desnyanskiy and Goloseevskiy districts. At the first stage, the separation of infectious and non-infectious diseases was carried out; later, the structure of the incidence of dogs with non-infectious pathology was researched. At the next stage, data were processed regarding the incidence of pathology of the digestive system. And, finally, data were obtained on the main part of pancreatic dogs diseases in general and pancreatitis in particular. Results of the research and their discussion. The obtained data indicated that only 8,9 % (456 animals) had infectious diseases, and 91,1 % (4619 animals) had non-infectiouspathology. Among non-infectiousdiseases the highest number were: skin diseases – 1123 animals (24,3 %); cardiovascular diseases – 968 animals (21 %); diseases of the digestive system – 937 animals (20,3 %); eye diseases – 722 animals (15,6 %) and diseases of teeth – 216 animals (4,7 %) (Fig. 1).

As can be seen from Figure 1, the disease of the digestive system of non-epidemiological etiology is 1/5 of the total non-contagious pathology and occupy the third place in frequency of occurrence. This fact is somewhat incongruous with the literature data, which indicate a lower percentage of the spread of diseases of the digestive system.

At the next stage, we conducted studies on the incidence of different nosological forms of the digestive system (Fig. 2).

As can be seen from Figure 2, among the diseases of the digestive system in dogs, the most common diseases of the intestine – 305 taurine (31,5 %); second place is the disease of the pancreas – 277 dogs (28,6 %); in the third place were diseases of the liver and gall bladder, which were diagnosed in 266 animals (27,5 %). In total, 100 animals (10,3 %) were diagnosed with stomach diseases, and in 20 animals (2,1 %) – diseases of the esophagus. Thus, pancreatic cancer in dogs is a third of the pathology of the digestive system.

Thus, inflammation of the pancreas in dogs is 94,6 % of the total number of pathologies of this organ. Analyzing the above, it can be argued that every 17 animals in Kyiv suffer from pancreatitis. Given the lack of objective diagnostic criteria for pancreatitis in dogs, the difficulty in verifying the diagnosis and frequent pancreatitis, together with related diseases, can be assumed that the data obtained are underestimated.

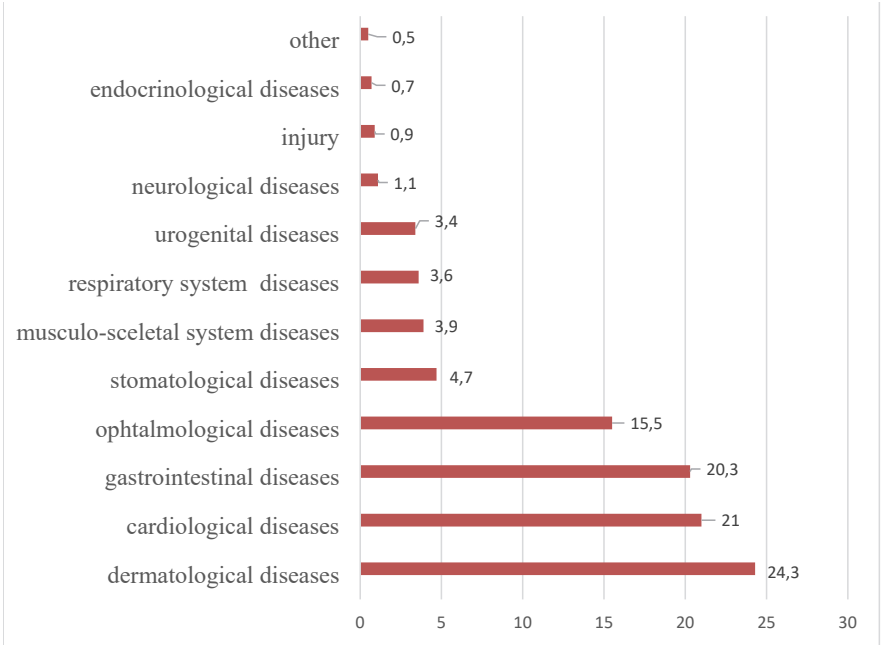

Fig. 1. The structure of non-ifectious pathology of dogs in Kyiv (Desniansky, Holosiivky, Desniansky districts) (n = 4619)

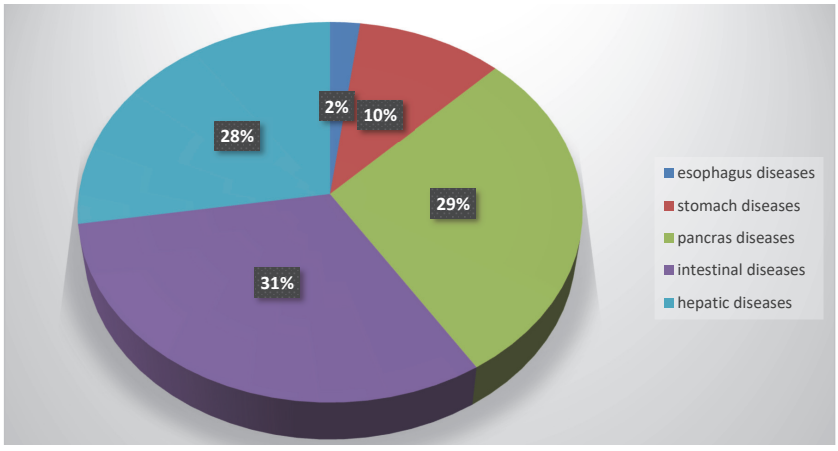

Fig. 2. Canine gastrointestinal diseases

Conclusions and future perspectives

Was studied the 5075 canine disease history in veterinary clinics in Kyiv. That more than 90 % of them had non-infectious diseases. Among the stricture non-infectious pathology 20,3 % are digestive diseases. In turn, among the canine digestive diseases the most frequent occurrence of intestinal diseases – 31, 5 %; the second place is

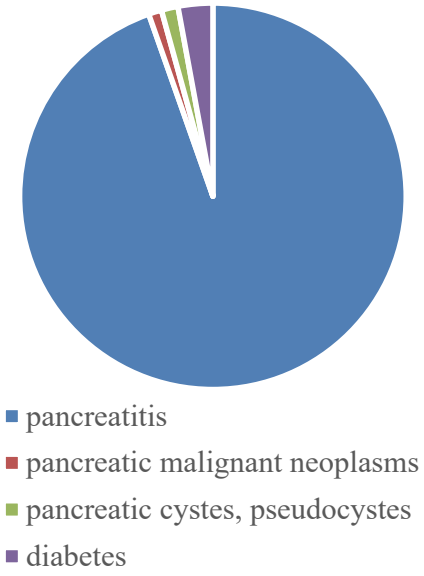

Fig. 3. Canine pancreatic diseases

occupied by diseases of the pancreas – 28, 6 %; in third place were liver and gall bladder diseases, which were diagnosed in 27,5 %. A total of 10,3 % animals had gastric diseases and 2,1 % had esophageal diseases. Among them, the main place belongs to the inflammatory disease of the pancreas of inflammatory genesis, which make up 28,6 % among pathologies of the digestive system and 94,6 % among pancreatic pathologies in general. Thus, inflammation of the pancreas in dogs is 94,6 % of the total number of pathologies of this organ.

References

Lee, J. K., Enns, R. (2007). Review of idiopathic pancreatitis. World journal of gastroenterology, 13(47): 6296–6313. doi:10.3748/wjg.v13.i47.6296

Xenoulis, P. G. (2015). Diagnosis of pancreatitis in dogs and cats. Journal of Small Animal Practice, 56(1):13–26. doi: 10.1111/jsap.12274.

Gori, E., Lippi I., Guidi, G., Perondi, F., Pierini, A., Marchetti, V. (2019). Acute pancreatitis and acute kidney injury in dogs, The Veterinary Journal, 245:77–81.doi: 10.1016/j.tvjl.2019.01.002

Zhan, X., Wang, F., Bi, Y., Ji, B. (2016). Animal models of gastrointestinal and liver diseases. Animal models of acute and chronic pancreatitis. American Journalof Physiology Gastrointestinal and Liver Physiology, 311(3):343–355. doi:10.1152/ajpgi.00372.2015.

Maier, A., Kaeser, R., Thimme, R., Boettler, T. (2019). Acute pancreatitis and vasoplegic shock associated with leptospirosis - a case report and review of the literature. BMC infectious diseases, 19(1):395. doi:10.1186/s12879-019-4040-1

French, J. M., Twedt, D. C., Rao, S., Marolf, A. J. (2019). Computed tomographic angiography and ultrasonography in the diagnosis and evaluation of acute pancreatitis in dogs. Journal of veterinary internal medicine, 33(1):79–88. doi:10.1111/jvim.15364

Watson, P. (2015). Pancreatitis in dogs and cats: definitions and pathophysiology. Journal of Small Animal Practice, 56(1):3–12. doi: 10.1111/jsap.12293.

Watson, P. J., Roulois, A. J., Scase, T. J., Iryine, R. (2010). Prevalence of hepatic lesions at post-mortem examination in dogs and association with pancreatitis. Journal of Small Animal Practice, 51(11):566–572. doi:10.1111/j.1748-5827.2010.00996.x

Watson, P. J., Roulois A. J., Scase, T., Johnston, P. E., Thompson, H., Herrtage, M. E. (2007). Prevalence and breed distribution of chronic pancreatitis at post-mortem examination in first-opinion dogs. Journal of Small Animal Practice, 48(11):609–618. doi:10.1111/j.1748-5827.2010.00996.x

Newman, S. J., Steiner, J. M., Woosley, K., Barton, L., Williams, D. A. (2005). Correlation of age and incidence of pancreatic exocrine nodular hyperplasia in

the dog. Veterinary Pathology, 42(4):510–513.doi:10.1354/vp.42-4-510

Rahmoun Djallal Eddine, Fares Mohamed Amine (2018). Analytical Study of Pancreatitis in Dogs. Journal of Dairy and Veterinary Sciences, 6(2):23–45. doi: 10.19080/JDVS.2018.06.555681

Sherding, R., Birchard, S., Johnson, S. (2006). Diseases and Surgery of the Exocrine Pancreas. In book: Saunders Manual of Small Animal Practice, 819–830. doi:10.1016/B0-72-160422-6/50075-9.

Nesterenko, Y. A., Laptev, V. V., Mihajlusov, S. V. (2004). Diagnostika i lechenie destruktivnogo pankreatita [Diagnosis and treatment of destructive pancreatitis]. BINOM – Press, 130. (in Russian)

Bondarevskaya, S. S., Poslov, G. A., Poslov, V. G. (2008). Pankreatit u sobak [Pancreatitis in dogs]. Praktik, 4:82–85. (in Russian)

Міластная, А. Г., Духницький, В. Б. (2019). ВИВЧЕННЯ РОЗПОВСЮДЖЕНОСТІ ПАТОЛОГІЇ ПІДШЛУНКОВОЇ ЗАЛОЗИ В СОБАК. *Ukrainian Journal of Veterinary Sciences, 10(4): 138–143, https://doi.org/10.31548/ujvs2019.04.018*

Анотація. *У статті наведено результати дослідження поширеності захворювань підшлункової залози серед собак у м. Києві. Було вивчено історії хвороби 5075 собак, які показали, що більше ніж 90 % випадків припадає на захворювання неінфекційної етіології. Встановлено, що захворювання органів травлення загалом становлять 20,3 % від загальної неінфекційної патології та займають третє місце за частотою виникнення після захворювань шкіри та серцево-судинної системи. Визначено, що серед захворювань травної системи у собак найчастіше виникають захворювання кишечника – 31, 5 %; друге місце займають захворювання підшлункової залози – 28,6 %; на третьому місці опинилися захворювання печінки та жовчного міхура – 27,5 %. Всього 10,3 % тварин страждали на захворювання шлунку, а 2,1 % – стравоходу. Основне місце належить патології підшлункової залози запального генезу, яка становить 28,6 % серед патологій травної системи та 94,6 % серед патологій підшлункової залози загалом. Так, запалення підшлункової залози у собак становить 94,6 % від загальної кількості патологій цього органу. Аналізуючи вищезазначене, можна стверджувати, що кожна 17 тварина у м. Києві страждає на панкреатит. Враховуючи багаточисельні складнощі діагностики панкреатиту у собак (відсутність об'єктивних діагностичних критеріїв, складність у верифікації діагнозу, висока частоту перебігу із супутніми захворюваннями) можна припустити, що отримані дані є заниженими.*

Ключові слова: *панкреатит, собаки, незаразна патологія, захворювання жовчовивідних протоків, підшлункова залоза*

Подано до друку 30 вересня 2019 року