

## VETERINARY RESEARCH

UDC 636.7/8:591.2:591.9

DOI: 10.15587/2519-8025.2022.260493

**PREVALENCE OF INTERNAL DISEASES OF DOGS AND CATS:  
A RETROSPECTIVE ANALYSIS (1994–2014)****Dmytro Morozenko, Roman Dotsenko, Yevheniia Vashchyk, Andriy Zakhariev,  
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**The aim:** to analyze the literature data for the period from 1992 to 2010 on the spread of internal diseases among dogs and cats.

**Materials and methods.** The research was conducted by the method of scientific literature open source analysis: Pub-Med, Elsevier, electronic resources of the National Library named after V.I. Vernadsky (1994–2014).

**Results.** In the practice of veterinary medicine, internal diseases are a significant part of other diseases of dogs and cats. According to research by domestic authors, a significant number of scientific issues in the study of internal diseases of both productive and non-productive animals remain unclear. Recently, significant progress has been made in the study of internal diseases of dogs, developed methods of their medical examination. Also in recent years, Ukrainian scientists have conducted fundamental research on domestic diseases of domestic cats – urolithiasis, chronic renal failure, glomerulonephritis, polycystic kidney disease, liver lipidosis. Foreign researchers most often diagnose the following internal diseases in dogs and cats among the pathologies of the respiratory, digestive, endocrine and urinary systems: chronic renal failure, glomerulonephritis, diabetes, chronic hepatitis and cholangiohepatitis, gastrointestinal and bronchial diseases. Diagnostic studies of animals with internal pathology are carried out using clinical, instrumental and laboratory methods. According to the scientific works of foreign scientists, the problem of diagnosis and treatment of diabetes is taken care of by scientists around the world, including veterinary medicine, so the problem of diabetes in domestic cats is very relevant in modern science and practice.

**Conclusions.** Thus, internal diseases are very common among dogs and cats, and the diagnosis and treatment of these pathologies needs further improvement. This is because the number of unproductive pets is constantly growing, and owners are increasingly seeking veterinary care. That is why there is a need to develop new advanced non-invasive and informative methods for diagnosing internal diseases based on biochemical and clinical and instrumental studies

**Keywords:** dogs, cats, internal diseases, bronchial asthma, glomerulonephritis, diabetes mellitus, cholangiohepatitis, chronic renal failure, prevalence, diagnosis

**How to cite:**

Morozenko, D., Dotsenko, R., Vashchyk, Y., Zakhariev, A., Seliukova, N., Zemlianskyi, A., Glibova, K., Kostyshyn, L.-M. (2022). Prevalence of internal diseases of dogs and cats: a retrospective analysis (1994–2014). ScienceRise: Biological Science, 2 (31), 8–12. doi: <https://doi.org/10.15587/2519-8025.2022.260493>

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**1. Introduction**

In the practice of veterinary medicine, internal diseases are a significant part of other diseases of dogs and cats. According to research by domestic authors, a significant number of scientific issues in the study of internal diseases of both productive and unproductive animals remain unclear [1]. Recently, significant progress has been made in the study of internal diseases of dogs, developed methods of their medical examination [2, 3]. Also in recent years, Ukrainian scientists have conducted fundamental research on domestic diseases of domestic cats – urolithiasis [4], chronic renal failure [5], glomerulonephritis [6], polycystic kidney

disease [7], liver lipidosis [8]. Foreign researchers most often diagnose the following internal diseases in dogs and cats among the pathologies of the respiratory, digestive, endocrine and urinary systems: chronic renal failure [9, 10], glomerulonephritis [11, 12], diabetes [13, 14], chronic hepatitis and cholangitis. [15, 16], gastrointestinal diseases [17] and bronchopneumonia [18]. Diagnostic studies of animals with internal pathology are performed using clinical, instrumental and laboratory methods [19, 20].

**The aim of the research** to analyze the literature data for the period from 1994 to 2014 on the prevalence of internal diseases among dogs and cats.

## 2. Materials and methods

The research was conducted by the method of scientific literature open source analysis: PubMed, Elsevier, electronic resources of the National Library named after V. I. Vernadsky (1994–2014).

## 3. Research results

Bronchopulmonary pathology occupies an important place among the internal diseases of dogs and cats, which is confirmed by the scientific works of various authors [21, 22]. According to research by A. I. Mayorov [22], in dogs, respiratory diseases occur rarely on their own, possibly due to species resistance. Bronchitis and bronchopneumonia in the first years of life often develop as a complication of specific infections – infectious laryngotracheitis, parainfluenza, calicivirosis and herpesvirus [23, 24].

According to H.G. Nimand et al. [25], inflammatory lung diseases in dogs may involve the respiratory tract (bronchitis), lung parenchyma (pneumonia), or both of these tissues – bronchopneumonia. According to S. V. Starchenkova [26], the diagnosis of respiratory diseases in dogs and cats is the use of general research methods (clinical investigation, which includes examination, palpation, auscultation and percussion), as well as special (rhinoscopy, laryngoscopy, radiography, radioscopy, laboratory examination of nasal, sputum). According to foreign authors, in addition to the above methods, blood tests and bronchoalveolar lavage are of important diagnostic value [27, 28]. The latter is analyzed by cytological, bacteriological and biochemical parameters.

According to research by C. R. Norris et al. [29], bronchiectasis has been described in cats as a consequence of chronic inflammatory diseases of the bronchopulmonary system, especially allergic bronchitis and bronchopneumonia. Biopsy, which detects interstitial fibrosis and obliterative bronchiolitis, plays an important role in the diagnosis of interstitial lung disease. In cats, a rare genetic disease, such as lipid pneumonia, has been described. Animals of this species also have chronic respiratory failure – a disease whose morphological basis is pulmonary fibrosis. According to studies by K. Williams et al. [30], interstitial inflammation is not expressed in cats with clinical symptoms of respiratory failure. Respiratory distress syndrome and cough were clinically observed in animals with pulmonary fibrosis, and symptoms of the disease were observed for six months [31].

Gastrointestinal diseases are one of the most common reasons for small pet owners to see a veterinarian. According to the Waltham Center, many methods have been developed to diagnose gastrointestinal diseases in dogs and cats, including blood tests. Dysfunction of the stomach and intestines in gastroenteritis can be manifested by a number of hematological and biochemical changes in blood and urine [32]. According to A. V. Starchenkova [33], gastroenteritis in dogs and cats is especially difficult if the pathological process involves all layers of the stomach and intestines. According to A. V. Lipin [34], gastritis and gastroenteritis occur in cats quite often and can have both acute and chronic course.

According to the results of basic research by O. A. Volkova [35], retrospective analysis of literature

data of both domestic and foreign researchers shows a high incidence (up to 50 % of all pathologies of non-communicable etiology) and significant mortality (up to 35 % of total animals) of dogs from gastrointestinal diseases. They were most common in the following breeds of dogs: Rottweiler – 10.4 %, German Shepherd – 9.8, Boxer – 9.4, Doberman – 9.1, Sharpei – 8.1, Pit Bull Terrier – 6.8, American Staffordshire Terrier – 6.2 %. In outbred dogs, symptoms of gastric diseases were observed in 5.5 % of cases. In dogs of breeds, such as poodles, Labradors and Basset Hounds, diseases of the proximal digestive system were observed in 4.5 %, 4.3 and 3.2 % of cases, respectively. As for the breeds of collie, setter, dachshund, Yorkshire terrier, the diseases of the esophagus, stomach and duodenum were isolated.

The scientific works of A. N. Chubin [36] covered the diagnosis of peptic ulcer disease in dogs, but these studies were conducted in an experiment. It is noted, that gastric ulcer in dogs began to be diagnosed more often due to the introduction of endoscopic research, but the author did not provide evidence for the spontaneous development of this disease in dogs and laboratory markers for diagnosis.

A very important area of research in the internal pathology of small domestic animals is an in-depth study of the pathogenesis, diagnosis and treatment of liver disease. According to A. V. Sisueva [37, 38], the most common in dogs are acute and chronic hepatitis and multiple liver tumors, in cats – acute hepatitis, cholangiohepatitis, lipidosis and liver metaplasia. According to research by D. S. Dimski [39], among dogs, chronic active hepatitis is more common in Dobermans, less common in Cocker Spaniels, Bedlington Terriers, Sky Terriers and Labrador Retrievers. Bitches are more often ill, the average age of patients is 6 years.

Inflammatory liver disease in cats accounts for 26 % of total liver disease. Other common liver diseases in cats are lipidosis (49 %) and lymphosarcoma (7 %). Studies have shown that all inflammatory liver diseases in cats can be divided into two groups: cholangiohepatitis and lymphocytic portal hepatitis. Chronic cholangiohepatitis is a serious disease in terms of prognosis: of the 16 cases of cat disease studied, 47 % of animals lived less than one year, 40 % lived from 1 to 5 years and 13 % – more than 5 years [40]. According to S. Center [41], more than 85 % of cats can develop liver lipidosis due to other diseases that are accompanied by anorexia. According to research by E.A. Chandler [42], in cats, among liver diseases are cholangitis/cholangiohepatitis, toxic hepatopathy, hepatic lipidosis, liver tumors and bile duct obstruction. According to M. A. Penny Watson [43], in some cases, dogs and cats are diagnosed with pathology, such as hepatic encephalopathy.

Kidney and urinary tract diseases are very often diagnosed in dogs and cats both in Ukraine and abroad. Glomerulonephritis and chronic renal failure (CRF) are some of the most common reasons cat owners turn to veterinary clinics. Chronic renal failure is diagnosed in approximately 8 % of cats older than 10 years and in 15 % of cats older than 15 years [44, 45]. According to S. A. Brown [46], the incidence of kidney disease in cats is 0.5–2 % of the total population of this species. How-

ever, the owners of aging animals mostly seek therapeutic help. According to materials, collected at Purdue University, in 1980 renal failure was diagnosed in 4 cats per 1,000, and by 1990 the rate had risen to 16 animals [47]. In the age group of cats older than 15 years, CRF is found in every third animal [48]. A study of 13 clinically healthy cats older than 7 years showed that all animals had a creatinine concentration in the blood above normal. Studies of the age predisposition of cats to the development of CRF have shown that males with CRF were younger than females (mean ages 12 and 14 years, respectively), and the breed was not important in the development of pathology [49]. Thus, CRF is common in cats older than 8 years and is the leading cause of death.

Dogs, according to A. Sanin et al. [50], among nephrological and urological diseases, are most often diagnosed with glomerulonephritis, urolithiasis, acute and chronic renal failure, pyelonephritis, bladder spasm and urocystitis. It should be noted, that glomerulonephritis in dogs is more often acute. According to G.F. Grauer [39], glomerulonephritis is found in dogs aged 8 months to 17 years, more often – at 6.5–7 years of age.

Urolithiasis is one of the most common pathologies in domestic cats. According to G. O. Yushchenko [51], of the total number of dogs and cats whose owners turn to veterinary clinics, urolithiasis was diagnosed in about 7 and 3 %, respectively, and cats have a proportional death from urolithiasis higher than humans and dogs [52]. Most uroliths in cats and dogs (95 %) are removed from the lower urinary tract, nephroliths in these animals are extremely rare [53, 54]. It is also known, that uroliths, which contain calcium salts and magnesium-ammonium phosphate – struvit, are most common in the urinary tract of humans, dogs and cats [55, 56]. Thus, it can be concluded, that urolithiasis in domestic cats is a widespread disease.

One of the most serious pathologies of the endocrine system, which is diagnosed in domestic cats, is diabetes [57]. The prevalence of diabetes among dogs and cats ranges from 1:50 to 1:400, affects every 50th to 400th animal, admitted to veterinary clinics. Diabetes is diagnosed in most cats older than 7 years, the highest incidence is registered in animals aged 10 to 13 years [58, 59]. In 80–95 % of diabetic cats, a number of morphological changes are found in the islets of the pancreas [60]. 5–20 % of sick cats are diagnosed with type I diabetes. According to D. Tarkoshova [61], diabetes melli-

tus in cats is clinically similar to type II diabetes mellitus in humans, also has a similar pathogenesis, risk factors and treatment strategy. Genetic factors are important in the development of diabetes in Burmese cats, which are at risk and prone to this disease [62, 63]. In 70 % of cases, diabetes is diagnosed in neutered cats. Other risk factors include old age, lack of physical activity, corticosteroids and obesity. Adult cats with diabetes are also diagnosed with a severe complication, diabetic neuropathy. According to K. E. Roish [64], diabetes is one of the most common endocrine disorders in cats, and, like humans, cats have a clear link between diabetes and obesity: up to 80 % of cats are obese at the time of diagnosis. Also severe complications of diabetes in cats are fatty hepatitis, or liver lipidosis [65], diabetic ketoacidosis [66, 67] and retinopathy [68].

According to the scientific works of foreign scientists, the problem of diagnosis and treatment of diabetes is taken care of by scientists around the world, including in veterinary medicine, so the problem of diabetes in domestic cats is very relevant in modern science and practice [69].

**Research limitations.** The studies were retrospective in nature and were based on literature sources that reflected the prevalence of internal diseases among dogs and cats as companion animals.

**Prospects for further research.** A promising area of research is to study the spread of internal diseases in different European countries and the further use of the obtained data for the analysis of morbidity.

#### 4. Conclusions

Thus, internal diseases are very common among dogs and cats, and the diagnosis and treatment of these pathologies needs further improvement. This is due to the fact that the number of unproductive pets is constantly growing, and owners are increasingly seeking veterinary care. That is why there is a need to develop new advanced non-invasive and informative methods for diagnosing internal diseases based on biochemical and clinical and instrumental studies.

#### Conflict of interests

The authors declare that they have no conflicts of interest.

#### Financing

The study was performed without financial support

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*Received date 12.05.2022*

*Accepted date 23.06.2022*

*Published date 30.06.2022*

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