The prevalence of ear diseases in cat and dogs in Kocaeli provinces

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ABSTRACT

Objective: In this study, it was aimed to determine the prevalence of ear diseases in cats and dogs brought to clinics in Kocaeli provinces.

Materials and methods: For this purpose, a general ear examination of 66 cats and 46 dogs brought to the clinic in Kocaeli were performed and the ear canal and eardrum were examined with an otoscope. In addition, a radiographic imaging method (x-ray), as well as microbiological and histopathological examinations were performed. After diagnosing the diseases, they were recorded and evaluations about ear diseases were analyzed statistically.

Results: As a result, the prevalence of ear disease in cats and dogs is high in Kocaeli province; It has been determined that improving the cleaning, feeding and sheltering conditions of animals will be effective in reducing these cases, and periodic clinical examinations will enable a fast and effective treatment process by early diagnosis of these diseases.

Keywords: *Cat, dog, Ear diseases, Parasites, Diagnosis*

INTRODUCTION

The ear, which has the function of providing balance in addition to the task of enabling living things to hear the sounds around them, is one of the important sense organs that directly affect the quality of life. In this context, identifying and treating ear diseases is very important in terms of animal health and quality of life.

Anatomically, the parts of the ear, which consist of three parts: the outer ear, the middle ear and the inner ear, are related to each other, and a negativity occurring in any part can affect other parts (Sasikala et al., 2011). Ear diseases generally have a progressive nature (Cabañes, 2020). For this reason, a late diagnosis of ear disease may cause the treatment process of the disease to be very difficult or treatment cannot be possible (Marignac, 2005). In recent years, an increase has

been observed in the number of cats and dogs brought to clinics with complaints of head shaking and ear scratching (Fatjó and Bowen, 2020). Head shaking and scratching the ears, which are the most obvious symptoms of ear diseases, can also occur in cats and dogs without ear diseases in some cases. In addition, in some cats and dogs, ear diseases may not cause any symptoms until they reach an advanced level, or animal owners may notice these symptoms quite late. This makes it difficult to diagnose and treat ear diseases before they reach the chronic level. Diagnosis and treatment of ear diseases, which is one of the diseases that are frequently encountered with the increase in the pet animals population, reveals the importance of studies in this field. (Morris, 2004)

Aural hematoma, which is one of the most common auricular diseases in cats and dogs, is a trauma condition that occurs due to constant head

shaking or constant scratching of the auricle. Otitis externa is a disease that occurs in the structures in the external ear canal. Otitis media is an inflammation of the middle ear cavity and tympanic membrane. Otitis interna, which occurs in hereditary or advanced infections, causes cases such as difficulty in walking in animals, instability in behavior due to the effect of the balance part, severe dizziness called vertigo, and coordination disorder in movements. External ear canal foreign bodies, which are more common in dogs than cats, include splinters, grass spiders (flounder grass) and sand grains. Inflammatory polyps, which are common tumor formations in the nasopharynx and eustachian tube, can be seen more frequently in cats aged 1-1,5 years. One of the common diseases in cats and dogs is tumors. Tumors that can occur in the auricle skin of old cats and dogs can be seen more frequently in cats (Janssens et al., 2016). It is of great importance to make the correct diagnosis in order to achieve successful results regarding the course, results and treatment process of ear diseases. An effective treatment process can be planned and carried out by making an accurate diagnosis as a result of taking anamnesis and effective otoscopic, dermatological, radiological and laboratory examinations (Pamuk et al., 2009). Controlling the active inflammation in the ear is the first goal of the ear disease treatment process. For this reason, after the continuous and predisposing factors that are effective in the emergence of the disease are taken under control, the antecedents should be determined and eliminated (Janssens et al., 2016). After the ear is cleaned and local factors are determined and eliminated, the appropriate treatment method should be determined by evaluating the test results and physical examination findings obtained within the framework of the anamnesis (Girao et al., 2006). The methods commonly used in the treatment of chronic ear diseases in cats and dogs are vertical and horizontal ear canal drainage, total ear ablation, lateral and ventral bulla osteotomy. In this study, it was aimed to reveal the prevalence of ear diseases in cats and dogs in Kocaeli, the seasonal distribution of ear diseases and the race, age and gender distribution.

MATERIALS and METHODS

This study was approved by the ethics committee of Fırat University on 22.05.2019 and with the decision no. 2019/81.

In the study, 526 cats and 342 dogs brought to two clinics in Kocaeli between 01/06/2019-01/06/2020 were examined. 112 animals of different breeds, ages and sexes, 66 cats and 46 dogs, were brought to two clinics (Güneş and Selçuk Veterinary Clinic) in Kocaeli province with complaints such as scratching their ears, shaking their heads, ear discharge, keeping their heads tilted, and bad ear odor between these dates. After the clinical examination, otoscopic examinations were performed. Radiological, microbiological and histopathological examinations were performed for animals deemed necessary. "Otology Patient Registration Form" has been prepared in order to ensure that patient registration and follow-up can be carried out in a regular and systematic way, and all information about the patients' definitions, clinical findings, otoscopic findings, and radiographic findings are written on these forms. In the clinical examination that started with inspection, the animal's gait, posture, ear posture, head movements, balance and itching were observed and recorded on the form. For direct and indirect ear examination, the animals were taken to the examination table and the external ear canal and auricle were examined and conditions such as bad odor, redness, discharge, swelling, redness of the ear skin, shedding of the ear hair and external ear canal opening were evaluated. After the palpation examination, the animal was placed in the lateral position for otoscopic examination and the external auditory canal was cleaned with cotton-wrapped alligator forceps before the examination. Ear discharge and earwax were swapped from the animals encountered with ear discharge and bad odor before the cleaning process, and then the cleaning process was started. Scraping samples were taken from animals with crusting, skin rash and redness for native parasitological examination. After cleaning, the pinna was placed in a suitable position for otoscopic examination and the presence of a foreign body, wound, hyperemia, tumor and hyperplasia in the meatus acusticus externa was investigated and the membrane tympani was examined.

In the study, the data obtained from the otology patient registration forms, in which the examination data were recorded, were transferred to the SPSS package program and analyzed. While determining the frequency and percentage values in the evaluation of the demographic data of animals such as province, species, age, race,

gender, and qualitative data on disease diagnoses; Arithmetic mean, standard deviation, independent groups t-test and one-way analysis of variance (ANOVA) tests were used to determine the distribution of diseases according to characteristics such as province, season, age, race and gender.

RESULTS

Within the scope of the research, a total of 868 animals, 526 cats and 342 dogs were examined in Kocaeli. The incidence of ear diseases was determined to be 12.9% in Kocaeli province. Ear diseases were found to be 12.5% in cats and 13.5% in dogs (Table 1). Considering the distribution of the animals brought to the clinic according to the season in which they got sick, it was determined that 28% got sick in the spring, 35% in the summer, 20% in the autumn and 17% in the winter.

Table 1. Findings regarding the incidence of ear disease.

Province	Kind	Number of animals examined	Number of animals with ear disease	%
Kocaeli	Cat	526	66	12.5
	Dog	342	46	13.5
	Total	868	112	12.9

Table 2. Distribution of animals by species.

Kind	f	%
Cat	66	58.9
Dog	46	41.1
Total	112	100

Table 3. Distribution of the cats examined in the study according to their breeds.

Breed (cat)	f	%
Angora cat	1	1.5
Bombay	2	3.0
British shorthair	7	10.6
Persian cat	4	6.0
Crossbred	9	13.6
Sarman	5	7.5
Scottish fold	18	27.2
Siamese	1	1.5
Tekir	17	25.7
Tri color	2	3.0
Total	66	100

It is seen that 58.9% of the animals participating in the research are cats and 41.1% are dogs (Table 2).

In this study, it was seen that there was no statistically significant relationship between the breeds of cats and the diagnosis of the disease (F=2.004; p>0.05). When Table 3 is examined, the most diagnosed cat breeds are Scottish fold and Tabby breeds; otitis externa (34.9%) and ear mites (30.4%) were diagnosed most often in Scottish fold cats, while otitis externa (47.9%) and wound (17.5%) diagnoses were seen in tabby cats.

In the study, it was observed that there was no statistically significant relationship between the breeds of dogs and the diagnosis of the disease (F=1.785; p>0.05).

Table 4. Distribution of the dogs examined in the study according to their breeds.

Breed (Dog)	f	%
German shepherd	1	2.1
Cocker spaniel	3	6.5
Golden retriever	5	10.8
Kangal	6	13.0
King Charles spaniel	1	2.1
Greek hound	3	6.5
Labrador retriever	1	2.1
Labrador crossbred	1	2.1
Crossbred	12	26.0
Pekingese	1	2.1
Pomeranian	1	2,1
Pug	3	6.5
Rotweiller	1	2.1
Setter	4	8.6
Terrier	2	4.3
Yorkshire terrier	1	2.1
Total	46	100

Table 5. Distribution of cats examined in the study by age.

Age (Cat)	f	%
3 months	7	9.3
4 months	2	3.5
5 months	2	2.3
6 months	4	7.0
8 months	2	2.3
9 months	2	2.3
1 years	21	25.6
1,5 years	3	1.1
2 years	12	24.9
3 years	4	7.0
4 years	5	12.5
5 years	1	1.1
6 years	1	1.1
Total	66	100

Table 6. Distribution of the dogs examined in the study by age.

Age (Dog)	f	%
3 Months	1	1.2
4 Months	2	2.4
6 Months	2	2.4
7 Months	1	1.2
8 Months	2	2.4
1 years	10	21.5
2 years	9	21.5
3 years	6	19.4
4 years	4	9.4
5 years	5	11.4
6 years	1	2.4
7 years	1	2.4
9 years	1	1.2
10 years	1	1.2
Total	46	100

Table 7. Distribution of the cats examined in the study by gender

Gender (Cat)	f	%
Male	36	53.5
Female	30	46.5
Total	66	100

Table 8. Distribution of the dogs examined in the study by gender.

Gender (Dog)	f	%
Male	25	58.6
Female	21	41.4
Total	46	100

When the table is examined, it is seen that the most diagnosed dog breeds are the cross breeds and Kangal breeds; While it is seen that otitis externa (38.7%) and foreign body (32.2%) diagnoses are made most in cross breed dogs, it is seen that otitis externa (69.2%) and foreign body (15.4%) diagnoses are made in Kangal breed dogs. (Table 4).

It shows that the cats examined within the scope of the findings obtained according to the age of the cats in the study are concentrated in the young age group (Table 5).

Table 9. Distribution of diagnoses made to animals within the scope of the study.

Diagnosis	f	%
Wound	11	9.8
Otitis externa	40	35.7
Foreign body	17	15.2
Fungal disease	11	9.8
Otitis media	11	9.8
Ear scabies	12	10.7
Inflammation	2	1.8
Hematoma	4	3.6
Otitis interna	4	3.6
Total	112	100

It was seen that there was no statistically significant correlation between the ages of the cats examined and the diagnosis of the disease (F=2.289; p>0.05). When the table is examined, it is seen that the most diagnosed age group is cats in the 0-1 age group and 2-4 age group; while otitis externa (33.3%) and ear scabies (20.4%) diagnoses were the most common in cats in the 0-1 age group, otitis externa (57.6%) and fungal infections were observed in cats in the 2-4 age group. (14.8%).

Table 10. Distribution of disease diagnoses by seasons.

Diagnosis	Spring		Summer		Autumn		Winter		f	p
	f	%	f	%	f	%	f	%		
Wound	9	18.0	3	5.0	3	8.6	6	21.4		
Dermatitis	-	-	1	1.7	-	-	-	-		
Eczema	-	-	1	1.7	-	-	1	3.6		
Otitis externa	19	38.0	25	45.8	20	57.3	10	35.8		
Foreign body	10	20.0	11	18.3	3	8.6	-	-		
Fungal	6	12.0	4	2.6	3	8.6	2	7.1	1.039	0.377
Otitis media	2	4.0	5	8.3	2	5.7	3	10.7		
Ear scabies	3	6.0	6	10.0	1	2.8	2	7.1		
Inflammation	-	-	2	3.3	-	-	-	-		
Hematoma	-	-	2	3.3	1	2.8	1	3.6		
Otitis interna	1	2.0	-	-	1	2.8	3	10.7		
Myiasis	-	-	-	-	1	2.8	-	-		
Total	50	100	60	100	35	100	28	100		

Table 11. Distribution of disease diagnoses by species.

Diagnosis	Cat		Dog		t	p
	f	%	f	%		
Wound	10	11.6	11	12.6		
Dermatitis	1	1.2	-			
Eczema	1	1.2	1	1.1		
Otitis externa	38	44.2	36	41.7		
Foreign body	5	5.8	19	21.9		
Fungal disease	11	12.8	4	4.6	3.683	0.057
Otitis media	3	3.4	9	10.4		
Ear scabies	10	11.6	2	2.2		
Inflammation	2	2.4	-			
Hematoma	2	2.4	2	2.2		
Otitis interna	3	3.4	2	2.2		
Myiasis	-	-	1	1.1		
Total	86	100	87	100		

It is seen that there is no statistically significant correlation between the ages of the dogs examined within the scope of the study and the diagnosis of the disease (F=0.360; p>0.05). When the table is evaluated, it is seen that the most diagnosed age group is dogs in the 0-1 age group and 2-4 age group; While otitis externa (38.1%) and foreign body (18.5%) diagnoses were the most common in dogs aged 0-1 (Table 6), otitis externa (43.2%) and foreign body diagnoses were observed in cats aged 2-4 years. object (25.0%) diagnoses were made.

It is seen that there is no statistically significant relationship between the genders of the cats (Table 7) examined and the diagnosis of the disease (t=0.554; p>0.05).

Again, it is seen that there is no statistically significant relationship between the genders of the dogs (Table 8) examined and the diagnosis of the disease (t=0.942; p>0.05).

Table 12. Microbiological examination findings.

Type	Species	Years	Gender	Season	Right ear	Left ear
CAT	Bombay	1	Male	Autumn	No reproduction	No reproduction
	Persian cat	2	Female	Summer	No reproduction	No reproduction
	Persian cat	2	Male	Winter	No reproduction	No reproduction
	Scottish fold	1.5	Male	Spring	No reproduction	No reproduction
	Scottish fold	2	Female	Summer	No reproduction	No reproduction
	Scottish fold	4	Male	Spring	*E. coli*	*E. coli*
	Scottish fold	1	Female	Winter	*Proteus* spp.	*Proteus* spp.
	Scottish fold	4	Female	Summer	*Pseudomonas* spp.	*Pseudomonas* spp.
	Scottish fold	6	Male	Summer	*E. coli*	*E. coli*
	Scottish fold	1	Male	Summer	No reproduction	No reproduction
	Tekir	1	Male	Spring	*E. coli*	No reproduction
	Tekir	3	Female	Summer	No reproduction	No reproduction
	Tekir	1	Male	Autumn	*Pseudomonas* spp.	*Pseudomonas* spp.
DOG	Golden	3	Male	Summer	*Staphylococcus* spp.	*Staphylococcus* spp.
	Golden	3	Female	Autumn	No reproduction	No reproduction
	Kangal	4 months	Male	Spring	*Proteus* spp.	*Proteus* spp.
	Labrador	6	Female	Spring	No reproduction	No reproduction
	Labrador crossbred	10	Female	Spring	*Streptococcus* spp.	No reproduction
	Pug	5	Female	Spring	*Staphylococcus* spp.	*Staphylococcus* spp.
	Pug	3	Male	Summer	No reproduction	*Staphylococcus* spp.
	Pug	2	Female	Autumn	*Pseudomonas* spp. + *Streptococcus* spp.	*Pseudomonas* spp.
	Setter	8 months	Male	Spring	*Staphylococcus* spp.	No reproduction
	Setter	3	Male	Winter	*Proteus* spp.	No reproduction
	Terrier	3	Female	Summer	No reproduction	No reproduction
	York shire	2	Male	Winter	*E. coli*	*E. coli*

It was determined that there was no statistically significant difference between the diagnoses made in the patients brought to the clinic and the seasonal variable (Table 9, 10) (F = 1.039; p>0.05).

It is observed that there is no statistically significant correlation between the types of patients examined and the diagnosis of the disease (Table 11) (F=3,683; p>0.05).

Swap samples taken from a total of 25 animals, 13 cats and 12 dogs, were examined in the study and the findings were interpreted in the table (Table 12).

DISCUSSION

In this study, which aimed to determine the prevalence of ear diseases in cats and dogs in Kocaeli, this rate was determined to be 12.9%. In Kocaeli province, it was determined that it was 12.5% in cats and 13.5% in dogs. This rate obtained in the study is lower than the rates reported in studies conducted in Antalya (Güler, 2014) and Istanbul (Demirutku, 2007). It has been determined that the incidence of ear diseases differs between provinces and the incidence of ear diseases is higher in Kocaeli province. It is thought that the high temperature and humidity values in Kocaeli province have an effect on this finding obtained in the research.

Demirutku (2007) determined that the diagnosis of diseases was observed at similar rates in the cases of cats and dogs examined in his study, and the diagnoses of ear diseases did not differ statistically significantly depending on the species variable.

Demirutku (2007) examined the prevalence of ear diseases in a patient group consisting of 279 dogs and 35 cats, and examined the animals brought to the Surgery Department of Istanbul University Faculty of Veterinary Medicine between 2002-2007. In the study, the changes in ear diseases in cats and dogs depending on various characteristics such as species, gender, age and race were investigated. While 48 auricle, 233 external ear canal and 11 both auricle and external ear canal diseases were found in dogs examined within the scope of the research, 4 auricle, 29 external ear canal and 2 both auricle and external ear canal diseases were found in cats. While only auricular diseases are 20 wounds, 9 auricular hematomas, 6 dermatitis, 5 tumors, 3 deformations, 2 vasculitis, 1 abscess, 1 rupture and 1 necrosis; only external ear canal diseases, 193 of them otitis externa, 22 of them foreign body, 10 of them tumor, 2 of them membrana tympani

perforation, 2 of them foreign body and otitis externa, 1 of them flounder-derived membrane tympani perforation and 1 of them ceruminolite; it has been determined that 5 cases of auricular hematoma and otitis externa, 3 cases of auricular deformation and otitis externa, 2 cases of wound and otitis externa, and 1 of them tumor and otitis externa are the cases where auricle and external ear canal diseases are seen together. Becerman (2019), in his study investigating the prevalence of ear diseases in 250 dogs in Diyarbakır Metropolitan Municipality animal care and rehabilitation center, determined ear diseases by clinical, radiographic and otoscopic examinations. In the study, 17% of ear disease diagnoses were auricular hematoma, 32% wound, 9% foreign body, 4% auricular abscess, 11% purulent discharge, 28% scabies, and 3% dermatitis. It was determined that 44.8% of them were otitis externa due to different reasons. In this study, otitis externa and foreign body cases were common in cats and dogs; It has been determined that secondary factors such as external ear canal shape, trauma, increase in cerumen and moisture level, obstruction and primary factors such as foreign bodies, allergies, ectoparasites are the main factors that play a role in the emergence of otitis externa in animals. In this context, it is thought that the greater exposure of the ear canal to these effects is effective in this finding. This finding obtained in the study shows parallelism with the findings of the studies in the literature.

Many ear diseases, especially otitis externa, are directly affected by humidity, temperature and precipitation, and an increase in otitis externa cases may occur depending on the increase in these factors. In studies, it is seen that the season with the highest incidence of otitis externa is summer, when the temperature and humidity are the highest, and ear diseases are observed more frequently in this season compared to other seasons (Carlotti 1991; Harvey et al., 2001; Krahwinkel, 2003; Rosychuk, 2005). It is thought that the fact that animals are exposed to more environmental effects due to the increase in the time they spend outside during the summer season is effective on this finding. Becerman (2019), in his study conducted in Diyarbakır province, stated that ear diseases in animals are more common in the summer months and this increases depending on temperature, humidity and precipitation conditions. This finding obtained

in the study is similar to the findings of the studies in the literature.

Güler (2014) examined a total of 335 animals, 173 cats and 162 dogs, in his study to determine the prevalence of ear diseases in cats and dogs brought to a pet clinic operating in Antalya. He examined the seasonal distribution of ear diseases in cats and dogs and determined that 43% of ear diseases were seen in spring and 30% in winter. Demirutku (2007), in his study in Istanbul, stated that the seasons are effective in the emergence of ear diseases, but he did not perform a statistical analysis revealing this relationship in his research. This finding differs from the finding obtained in the study. It is thought that this situation is due to the special care conditions and geographical conditions of the animals.

It was determined that ear scabies and fungal diagnoses were more common in cats, while foreign body and otitis media diagnoses were more common in dogs. It is thought that this difference is due to special reasons such as the anatomical structures of the animals, their care conditions and social environments. Demirutku (2007) examined the prevalence of ear diseases in 279 dogs and 35 cats in his study and found that the diagnoses of ear diseases did not differ significantly according to the species, but showed a similar distribution. This finding obtained in the study is similar to the findings obtained in the studies in the literature.

In addition to the anatomical structure of the ear, the racial variant can also have a significant effect on ear diseases. In the study, the most common cat breeds with ear disease were Scottish fold and tabby; It was determined that the dog breed was Kangal and crossbreds. It has been determined that otitis externa is the most common diagnosis in all cat breeds, but ear scabies diagnoses are more common in the Scottish fold breed than in other breeds. It is thought that the inward-curving structure of the ears of Scottish fold cats is effective in this finding. It is thought that the fact that tabby cats have erect and medium-sized ears is more effective in the occurrence of ear injuries than other breeds. It has been determined that foreign body diagnosis is more common in crossbred dogs than in other dog breeds. It was determined that the diagnosis of otitis externa was most common in Kangals. Otitis externa, hematoma and auricle sores are frequently encountered in dog breeds with droopy ears such as Golden, Cocker spaniel and Labrador (Cole, 2004; Smeak, 2011; Swaim and

Bradley, 1996; Plunkett, 2002). In his study, Fossum determined that ear diseases did not differ significantly according to the race variable, but diseases such as otitis externa, wounds and foreign bodies were more common in breeds with long ears. Becerman (2019) examined the relationship between ear diseases and dog breeds in his study. It was determined that 60% of the dog breeds examined in the study were Terrier, Kangal, crossbreed and German shepherd breeds, that the distribution of the disease did not differ significantly depending on the breeds, and that the rate of disease was high in crossbred and Kangal dogs, which are breeds that do not have long ears. Angus (2004) determined in their study that the incidence of many types of diseases, especially otitis externa, is higher in animals with long and drooping ears. Cole (2004) stated in his study that 20% of cases of otitis externa were encountered in dogs with drooping and long ears. Güler (2014) examined the relationship between the distribution of ear diseases and animal breeds and determined that there was no statistically significant difference between ear diseases and the breed variable, but the incidence of ear disease was higher in Cocker, Labrador and Golden retriever breeds than in other breeds. This finding obtained in the study is similar to the findings obtained in the studies in the literature.

It is stated that ear diseases are more common in dogs between the ages of 5-8 and cats between the ages of 1-4 (Rosychuk, 2005; Krahwinkel, 2003). Demirutku (2007), in his study, determined that the incidence of ear disease in dogs is mostly concentrated in the 5-8 age group. Again, Güler (2014) determined in his study that ear diseases are more common in animals aged 4-7 years. In this study, it was determined that ear diseases were seen at a higher rate in dogs aged 1-4 in cats and dogs in the 0-4 age group. This finding differs from the findings in the studies in the literature. It is thought that this difference is due to the regional and climatic conditions in which the animals live and the different care conditions.

In the study, it was determined that ear diseases in cats and dogs were at similar levels in both female and male animals. Apaydın and Hasandayıoğlu (2018) stated in their study that there was no statistically significant relationship between the gender variables of dogs and the diagnosis of ear diseases, and that gender was not an effective factor in ear diseases. This finding obtained in the

research shows parallelism with the findings obtained in the studies in the literature.

As clearly stated in Table 12, microbiological evaluations are presented. And this finding is in line with the findings of Becerman (2019), Demirutku (2007), Apaydın and Hasandayıoğlu (2018) and Güler (2014) in their studies.

CONCLUSION

As a result, the prevalence of ear disease in cats and dogs is high in Kocaeli province; It has been determined that improving the cleaning, feeding and sheltering conditions of animals will be effective in reducing these cases, and periodic clinical examinations will enable a fast and effective treatment process by early diagnosis of these diseases.

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