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Etiology, Clinical Picture, Features of Diagnosis and Treatment of Mycoplasmosis in Parrots

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ABSTRACT

In recent years, due to the rather large import of parrots from other countries, cases of acquiring exotic birds with infectious pathologies have become more frequent. Failure to comply with the basic rules of acquisition, quarantine, maintenance, feeding and treatment, further leads to deterioration of the bird's condition or exacerbation of an infectious disease. One of these diseases is respiratory mycoplasmosis, which is not included in the list of mandatory studies. The manuscript contains data on the etiology, clinical picture, features of diagnosis and treatment of mycoplasmosis in parrots. When examining 36 parrots for mycoplasmosis, positive results of laboratory studies of nasal flushes by PCR were obtained in 26 birds (76 %). Of the 26 parrots with positive laboratory results for mycoplasmosis, the majority of birds (24) had a more or less pronounced clinical picture of the disease - 92%, and 2 parrots (8%) had no symptoms of the disease. In the treatment of mycoplasmosis in parrots, the antibiotic doxycycline was given to 14 parrots. After the treatment, negative laboratory results for mycoplasmosis were obtained in 12 parrots (86%), and 2 amazons (14%) had a relapse of the disease. In the future, these parrots were treated with another antibiotic Tylosin, after which there was a complete recovery of the birds. 13 parrots received the antibiotic Tylosin, 11 of them recovered (85%), which was confirmed by the absence of symptoms of the disease and negative laboratory results for mycoplasmosis. In this experimental group, 2 parrots fell (15%).

The conducted studies have shown that long-term treatment of avian mycoplasmosis with the use of the antibiotic Tylosin according to the chosen scheme gives a complete cure, confirmed by laboratory tests in 3 months, 6 months and 1 year. When using a treatment regimen using the antibiotic Doxycycline, in some cases (14%), the disease relapses.

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Keywords: parrots, bird diseases, PCR diagnostics, associated course, mycoplasmosis.

INTRODUCTION

Ensuring reliable food security in the context of global deurbanization and deglobalization is one of the most important and priority national goals. Therefore, the tasks that veterinary medicine sets itself, namely: optimization of veterinary services, reduction of morbidity and mortality of animals, due to effective prevention and improvement of measures to combat various pathologies, play a crucial role both in improving the quality of life of animals in particular, and in preserving the health of the entire human population as a whole [1-9]. Every year, the population of domestic animals, including birds, is growing, the number of shelters and nurseries for them is increasing, the number of specialized veterinary clinics is growing, new breeds of them are being selected and imported from abroad. Infectious diseases occupy one of the leading positions in the practice of treating poultry, and the issues of etiology, clinical picture, diagnosis and treatment remain poorly understood [9-16].

In recent years, due to the rather large import of parrots from other countries, cases of acquiring exotic birds with various diseases have become more frequent. When buying exotic birds in markets and shops, the owners face various health problems of birds, not realizing that the disease can be infectious in nature and pose a danger to themselves and others. And non-compliance with the basic rules of acquisition, quarantine, maintenance, feeding and treatment, further leads to deterioration of the bird's condition or exacerbation of an infectious disease [17-23].

One of these diseases is respiratory mycoplasmosis, which is not included in the list of mandatory studies. Avian mycoplasmosis is an infectious disease that affects not only farm birds, but also exotic parrots, characterized by respiratory and eye damage and a chronic course, the causative agents of which are facultative microbes Mycoplasma gallisepticum and Mycoplasma sinoviae, which occupies an intermediate position between bacteria and filtering viruses [24-30].

The main list of mandatory studies for exotic birds includes diseases: ornithosis, salmonellosis, avian influenza. Therefore, people who buy a feathered pet with a mandatory list of studies often face the problem of the so-called cold, linking the bird's malaise with hypothermia, and using a standard set of antibacterial agents, do not get the proper effect [31-39].

Breeders who form their pairs from wild birds also began to face this problem. All previously used treatment regimens either gave a temporary effect or did not give any result at all. Problems that breeders faced and for which they could not find the cause for a long time: sudden death of a bird, for no apparent reason; frequent, recurrent "colds" that cannot be cured; "suffocators" - frozen embryos in eggs [9, 21, 35, 40].

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Host-pathogen interaction is at the heart of any infectious disease system and provides an important framework for studying infectious diseases at the individual, population, and ecosystem levels. Therefore, the motivation for this article is a bacterial disease of parrots caused by the pathogen Mycoplasma sp. p. For therapeutic and prophylactic purposes, birds use broad-spectrum antibiotics for respiratory mycoplasmosis. However, their unsystematic use, without taking into account all members of the association of pathogens involved in the infectious process, and their sensitivity to drugs, often does not allow achieving the desired results [41-45].

In connection with the above, **the aim of the study** was to study the etiology, the process of development of respiratory mycoplasmosis in parrots, transmission routes, features of diagnosis, treatment and prevention of the disease, taking into account the entire association of microorganisms involved in the infectious process, with mandatory laboratory methods for monitoring their effectiveness.

MATERIALS AND METHODS

The subject of the study was parrots imported from other countries (Africa, Latin America), parrots bred in captivity by private breeders, kept by a single owner, as well as parrots with various symptoms of respiratory diseases.

The following species of parrots participated in the study: Jaco-5 heads (imported from Africa and kept in families at different times); Amazons-24 heads (brought from Latin America and kept in different families and nurseries); Corella-nymphs – 3 heads (purchased from breeders); Congolese parrot – 2 heads (imported from Africa and kept by a private breeder); Senegalese parrots-2 heads (imported from Africa and kept by a private breeder).

Laboratory studies of mucosal flushes by Polymerase chain reaction (PCR) were conducted for mycoplasmas from birds with clinical signs and from parrots that do not have obvious symptoms of the disease. To exclude diseases with similar clinical signs, differential diagnosis was performed by PCR for ornithosis. To identify secondary pathogenic microflora, microbiological examination of mucosal flushes was performed to determine the sensitivity to antibiotics by conventional methods.

During the clinical examination, attention was paid to the following symptoms: the general condition of the bird: depressed or active; the condition of the upper respiratory tract: the presence of crusts, mucous secretions, darkening of the nostrils on/in the nasal openings; the condition of the eyes: hyperemia, edema, lacrimation, closed eyelids; the position of the body on the perch: hunched, low landing, the direction of the tail to the floor, externally noticeable movements of air bags, asymmetric movements during breathing, which indicates a lesion of the respiratory system; the state of the musculoskeletal system: the presence of lameness, uncertain movements of the

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bird on the perch; thermometry is one of the most important methods of clinical examination. Almost all processes in birds are associated with a fairly high body temperature. And in a state of intoxication, the body temperature drops rapidly, and the bird dies not so much from the infection itself, but from the pathological processes triggered by hypothermia (hypoxia, heart failure, etc.).

In some cases, X-ray examinations were performed to clarify the localization of the pathological process in the respiratory system, which helps to more accurately diagnose and prescribe the correct treatment.

For the treatment of parrots with positive laboratory results for mycoplasma, 2 antibiotics were selected, recommended as effective against Mycoplasma spp.: 14 birds received doxycycline at a dose of 40 mg/kg of weight orally 2 times a day for 5 weeks, and for 13 parrots, the antibiotic Tylosin at a dose of 30 mg/kg of bird weight intramuscularly 2 times a day for 6 weeks.

In addition, the following symptomatic treatment was applied to the birds of both experimental groups: for hypothermia: homeopathic preparation "Temperin" 20 grains in 5 ml of water, 1 drop in the beak every hour until the body temperature rose 40 ° C and above and its stabilization, and only after normalization of body temperature, treatment with an antibiotic was started; inhalation (soda, validol, eucalyptus); washing of the nasal passages with antiseptic solutions (soda, miramistin); homeopathic preparation "Apterin" 20 grains in 5 ml of water, 3 drops in the beak 5-6 times a day (for bronchitis, pneumonia); Heptral 0.3 ml intramuscularly 1 time a day (hepatoprotector); water-salt solutions, glucose, gamavit (for cachexia, dehydration, intoxication). After treatment, the parrots' health, recovery and recovery processes were monitored, with repeated laboratory tests for mycoplasmosis.

The results of the studies were processed statistically and presented in pictures.

RESULTS AND DISCUSSION

In most cases, the symptoms that bird owners pay attention to are: discharge from the nasal openings, discharge from the eyes (often one-sided), frequent sneezing, twitching of the head, nasal openings sealed with dry crusts, unnatural landing on a perch, refusal to eat, lethargy. A general view of an Amazon with mycoplasmosis is shown in Figure 1.

When examined in birds, the main symptoms are violations of the respiratory system: difficulty breathing, wheezing is heard during auscultation.

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Fig. 1. Amazon with mycoplasmosis

The differential diagnosis was made for ornithosis and mycoplasmosis.

When examining 36 parrots for mycoplasmosis, positive results of laboratory tests of nasal flushes by PCR were obtained in 26 birds (76%), and 8 heads (24%) had negative results. The percentage of birds with positive and negative results of the study for mycoplasmosis found its imprint in Figure 2.

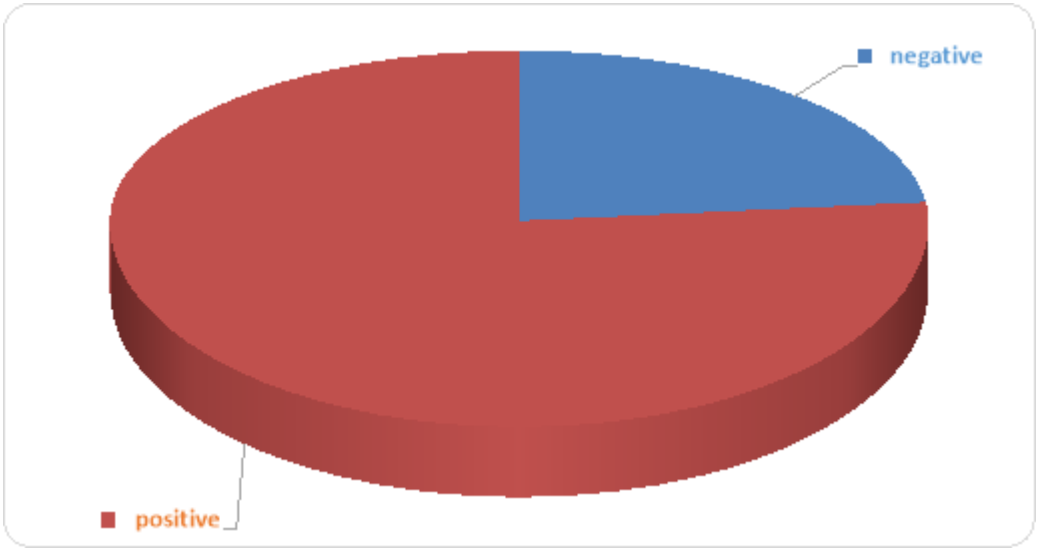

Fig. 2. Percentage of birds with positive and negative results of the study for mycoplasmosis

Of the 26 parrots with positive laboratory results for mycoplasmosis, the majority of birds (24) had a more or less pronounced clinical picture of the disease - 92%, and 2 parrots (8%) had no symptoms of the disease. In the treatment of mycoplasmosis in parrots, the antibiotic doxycycline was given to 14 parrots. After the treatment, negative laboratory results for mycoplasmosis were

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obtained in 12 parrots (86%), and 2 amazons (14%) had a relapse of the disease. Later, these parrots were treated with another antibiotic Tylosin, after which the birds completely recovered. 13 parrots received the antibiotic Tylosin, 11 of them recovered (85%), which was confirmed by the absence of symptoms of the disease and negative laboratory results for mycoplasmosis. In this experimental group, 2 parrots fell (15%). It is impossible to link the death of birds with the use of tylosin, because one of them - the red-tailed Jacko at the time of treatment was in a state of extreme severity (hypothermia-38C at a norm of 41-42C, cachexia - the weight of the bird is 280 g. at a rate of 500-550 g, died on the 2nd day), and another parrot Corella-died as a result of an error of the owner, who gave him the drug Tylosin, more than 10 times exceeding the single dose.

As a result of the study, it was revealed that the incubation period of mycoplasmosis in parrots lasts from 4 to 6 weeks. For parrots, the horizontal path of infection is most relevant in places where birds congregate (nurseries, places of overexposure and mass trade in birds) and keeping patients with healthy ones in the same room and in close contact with each other. Infection of parrots kept in captivity occurs, as a rule, by aerogenic and contact pathways in case of non-compliance with the rules of quarantine and keeping birds. The vertical method of infection for exotic birds is less relevant, because infected or sick birds, or do not lay, or chicks die in the embryonic period of development, or in the first day of life. And the number of large parrots that are in breeding is negligible. Breeding is usually seasonal and the clutch is small (in the clutch, as a rule, from 1 to 5 eggs). Accordingly, before breeding, such parrots are carefully examined for the main diseases in order to prevent the death of the chicks.

It has been established that avian mycoplasmosis can occur: in acute form – manifests itself acutely, with abundant purulent discharge, usually with hypothermia and severe intoxication; in subacute form-manifests itself with scanty discharge from the nasal passages, unilateral eye swelling, at normal body temperature; in latent form – proceeds asymptomatically, but under certain conditions, can go into acute; in chronic form – manifests itself with minor sneezing, periodic runny nose. The symptoms are very blurred, so the owners attribute these symptoms to hypothermia of the bird, a"cold". Any stress associated with transportation, violations of the content and nutrition, beriberi, hypothermia, and immunodeficiency conditions can provoke an exacerbation of the latent and chronic forms. For birds brought from nature, the main provoking factors are the processes of acclimatization and transport stress.

The conducted studies have shown that long-term treatment of avian mycoplasmosis with the use of the antibiotic Tylosin according to the chosen scheme gives a complete cure, confirmed

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by laboratory tests after 3 months, 6 months and 1 year. When using a treatment regimen using the antibiotic Doxycycline, in some cases (14%), the disease recurs.

When prescribing the treatment of mycoplasmosis in parrots, the following important points should be taken into account: the weight of the bird, since all drugs for individual treatment are prescribed exclusively based on the active substance per 1 kg of bird weight; poultry body temperature: at a low temperature, below 40C, the effectiveness of treatment with antibacterial agents decreases, and the toxic effect increases, and the higher the probability of death, so it is necessary to use antibiotics only after raising the body temperature of the bird to normal with the help of the homeopathic drug "Temperin" (the rise in body temperature usually occurs within a day), while the effectiveness of the antibiotic increases, and the bird tolerates treatment without consequences and complications; laboratory data: for mycoplasmosis and concomitant pathogenic microflora. It is necessary to exclude infections that are symptomatically similar to mycoplasmosis (ornithosis, infections of bacterial and fungal origin); the general condition of the bird; conditions of detention; anamnesis.

In addition to the above, in the treatment of poultry: with intoxication or dehydration of the body, use methods of non-specific therapy aimed at restoring water-salt and electrolyte metabolism; pay attention to vitamin therapy and, in some cases, normalization of calcium metabolism; in complex therapy, good results are obtained during the treatment of birds by inhalation. Inhalations are carried out 1-2 times a day with the composition: soda, validol, eucalyptus. A container with boiling water and ingredients is placed under the cage, the cage is covered with a blanket, the exposure time is 15-20 minutes. Parrots receiving steam alkaline inhalations quickly give a positive response to specific treatment of mycoplasmosis, because breathing is easier, and the outflow of inflammatory exudate from the nasal passages improves, especially when infra-orbital sinuses are affected; in chronic mycoplasmosis with weak symptoms, a good result was shown by the homeopathic drug "Apterin", against the background of which the withdrawal of inflammatory exudate through the nasal passages is facilitated.

Veterinary specialists should take into account that without treatment of mycoplasmosis in parrots, the probability of death is quite high. Quite often, mycoplasmosis of birds is combined with dangerous and aggressive infectious diseases, such as ornithosis. Therefore, it is necessary to take into account the risk of concomitant diseases for humans, to conduct explanatory work with the owners, to observe personal safety measures, to disinfect the premises where the infected bird is located, as well as contact items (feeders, drinkers, cages).

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It is not uncommon for the owner to confuse the symptoms of respiratory mycoplasmosis with colds, associating them with hypothermia of the bird or finding it in a "draft". And according to recommendations on the Internet, or other sources, they begin to give antibacterial drugs in small doses or a short course. Thus complicating the very diagnosis of mycoplasmosis and the treatment process.

With a comprehensive approach to treatment and a long course, good results were obtained in the treatment of mycoplasmosis. Based on the laboratory tests performed by PCR, negative results were obtained 1 month after treatment or more.

Further observation of the studied birds showed the absence of recurrent symptoms for a long time. Many birds were observed up to 2 years after recovery.

To prevent the spread of infection, we recommend the following preventive measures: compliance with sanitary and hygienic and zootechnical rules; compliance with the rules for planting birds in the aviary; compliance with quarantine with mandatory tests for mycoplasmosis, ornithosis, avian influenza for all newly acquired exotic birds, especially from places of accumulation and contact of a large number of birds (pet stores, markets, poultry houses), as well as for all birds imported from other countries; separate maintenance of sick birds for the duration of treatment and until their complete recovery with the mandatory receipt of negative laboratory results for mycoplasma; regular disinfection of the room. For this purpose, it is possible to carry out quartzization, treatment with disinfectants. The method of spraying with a cold mist generator is particularly well established.

CONCLUSION

In recent years, due to the rather large import of parrots from other countries, cases of acquiring exotic birds with infectious pathologies have become more frequent. Failure to comply with the basic rules of acquisition, quarantine, maintenance, feeding and treatment, further leads to deterioration of the bird's condition or exacerbation of an infectious disease. One of these diseases is respiratory mycoplasmosis, which is not included in the list of mandatory studies.

Therefore, the study of the etiology, the process of development of respiratory mycoplasmosis in parrots, transmission routes, features of diagnosis, treatment and prevention of the disease, taking into account the entire association of microorganisms involved in the

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infectious process, with mandatory laboratory methods for monitoring their effectiveness, is, in our opinion, an urgent direction for scientific research.

Symptoms that you need to pay attention to are discharge from the nasal openings, discharge from the eyes (often one-sided), frequent sneezing, twitching of the head, nasal openings sealed with dry crusts, unnatural landing on a perch, refusal to eat, lethargy. During the examination of the sick parrots, the main symptoms revealed violations of the respiratory system: difficulty breathing, wheezing is heard during auscultation.

When examining 36 parrots for mycoplasmosis, positive results of laboratory studies of nasal flushes by PCR were obtained in 26 birds (76 %). Of the 26 parrots with positive laboratory results for mycoplasmosis, the majority of birds (24) had a more or less pronounced clinical picture of the disease - 92%, and 2 parrots (8%) had no symptoms of the disease.

In the treatment of mycoplasmosis in parrots, the antibiotic doxycycline was given to 14 parrots. After the treatment, negative laboratory results for mycoplasmosis were obtained in 12 parrots (86%), and 2 amazons (14%) had a relapse of the disease. Later, these parrots were treated with another antibiotic Tylosin, after which the birds completely recovered. 13 parrots received the antibiotic Tylosin, 11 of them recovered (85%), which was confirmed by the absence of symptoms of the disease and negative laboratory results for mycoplasmosis. In this experimental group, 2 parrots fell (15%).

As a result of the study, it was revealed that the incubation period of mycoplasmosis in parrots lasts from 4 to 6 weeks. For parrots, the horizontal path of infection is most relevant in places where birds congregate (nurseries, places of overexposure and mass trade in birds) and keeping patients with healthy ones in the same room and in close contact with each other. Infection of parrots kept in captivity occurs, as a rule, by aerogenic and contact pathways in case of non-compliance with the rules of quarantine and keeping birds.

It has been established that avian mycoplasmosis can occur: in acute form – manifests itself acutely, with abundant purulent discharge, usually with hypothermia and severe intoxication; in subacute form-manifests itself with scanty discharge from the nasal passages, unilateral eye swelling, at normal body temperature; in latent form – proceeds asymptomatically, but under certain conditions, can go into acute; in chronic form – manifests itself with minor sneezing, periodic runny nose.

The conducted studies have shown that long-term treatment of avian mycoplasmosis with the use of the antibiotic Tylosin according to the chosen scheme gives a complete cure, confirmed by laboratory tests after 3 months, 6 months and 1 year. When using a treatment regimen using the antibiotic Doxycycline, in some cases (14%), the disease recurs.

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Competing Interests

The authors declare that they have no competing interests.

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