Preventing Common Causes of Respiratory Problems in Parrots

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Abstract: A variety of noninfectious ailments can be considered common causes of respiratory issues in parrots. A thorough questionnaire combined with a detailed physical examination are the most important tools for establishing a diagnosis. A combination of factors is responsible for the development of respiratory problems. In daily practice, the most frequent causes remain malnutrition, inappropriate climate conditions and stress factors. There is a need to focus on prevention by establishing tailored management protocols for different species to ensure the health and welfare of parrots in captivity.

Introduction

In 2014, I was asked to chair a roundtable on prevention at the Association of Avian Veterinarians (AAV) annual conference in New Orleans. In my experience, prevention is always about preventing health and welfare problems. I conducted a survey, reviewing the AAV and European Association of Avian Veterinarians conferences I attended between 1987 and 2014, looking for the word prevention in titles or key words. I also examined various textbooks in the field of avian medicine. The outcome was that the word prevention was hardly mentioned. In the literature, the topic of prevention is not a priority. In my experience as an avian veterinarian, respiratory problems are the most common health issues in parrots. It is not unusual to discover respiratory issues during an appointment originally made for other reasons. As a veterinary student, I learned from Prof. P. Zwart, who was then head of the division of pathology dealing with birds and exotic animals, about various management failures as causes of non-infectious ailments and death. Prof. Zwart motivated and supported me as my mentor to become an avian veterinarian. He can be considered one of the founders of avian and exotic animal medicine. During the ExoticsCon conference in Boston in 2023, Prof. Zwart received a lifetime achievement award from the Association of Reptile and Amphibian Veterinarians for his contributions to reptile medicine. At the age of 91, he co-authored an article in 2021 with Dr. Jaime Samour, titled The Avian Respiratory System and Its Non-infectious Ailments: A Review, published in the *Journal of Exotic Pet Medicine*.[1] Prof. P. Zwart passed away in January 2024, at the age of 94. In a way, this presentation is a tribute to his contributions.

Anatomy and Physiology of the Avian Respiratory System

The avian respiratory system is described as a dual system, consisting of lungs for the exchange of gases and a number of air sacs that function as ventilators.[2,3] The air sacs fill more than 30% of the volume of the bird's coelomic cavity.[4] The avian respiratory system is considered the most complex respiratory system in the vertebrate world.[5,6] The O_2/CO_2 exchanging surface, relative to the size of the bird, is much larger compared to that of mammals. The evolution of the avian respiratory system achieved its most efficient state, enabling birds to sustain flight. Birds can fly at high altitudes, efficiently utilizing low levels of oxygen to support their high metabolic rate.[7,8]

A Variety of Noninfectious Ailments Cause Respiratory Problems

Malnutrition

As documented by Prof. Zwart in 1979, vitamin A deficiency in parrots is one of the best-known and most common causes of serious health problems.[1,9] Vitamin A plays a role in both the innate immune system and in adaptive immunity. It provides and enhances defense against multiple diseases.[9,10] Vitamin A deficiency makes birds more vulnerable to infectious diseases, such as aspergillosis. It also causes visual and reproductive problems.[11]

Vitamin A deficiency remains a major cause of multiple health issues. One of the most obvious outcomes is epithelial squamous metaplasia which is manifested as hyperkeratosis of the oral cavity, conjunctiva, nasal lacrimal duct, upper alimentary tract and respiratory tract. In African greys massive keratin rhinoliths can be observed, distorting the nares and nasal sinus.[4] The nasal passages, tear and salivary glands, uropygial gland, and adjacent epithelia can also be affected. In African greys, there is a close relationship between the vitamin A content of the liver and the extent of the lesions.[1] In cockatiels, it has been reported that this species is more sensitive to diets containing excess vitamin A than to diets that are deficient.[12,13]

In addition to squamous metaplasia changes in the nares, the epithelium surrounding the eyes and the tear gland, we may observe that the papillae at the choana in the oral cavity are blunted or edematous.[14] The glands on the caudo-dorsal and lateral surface of the tongue may appear whitish and bulging.

As we can imagine, the epithelium of the mucous membranes throughout the respiratory tract is affected when dealing with vitamin A deficiency caused by malnutrition. This makes malnutrition a very common cause of respiratory problems.

We must acknowledge that when we are dealing with vitamin A deficiency caused by malnutrition, we are also dealing with a combination of deficiencies. An important outcome of malnutrition is skin abnormalities. Clinical signs of vitamin A deficiency may also involve the integumentary system and can manifest as overgrowth of the beak and nails. Hyperkeratosis may occur with the skin becoming dry and flaky, and we can expect feather abnormalities and molting problems associated with malnutrition.[12]

Treating only the vitamin A deficiency does not resolve the broader health issues associated with malnutrition, including deficiencies in other vitamins, trace elements, and amino acids. The most commonly fed seeds generally lack 32 essential ingredients, including vitamins, minerals, trace minerals, pigments, protein, fiber, vitamin precursors, and omega-3 fatty acids.[11]

When evaluating birds in daily practice, we observe a variety of clinical signs of malnutrition in birds fed different commercial diets. In the opinion of the author, the birds themselves show us whether the provided nutrition is sufficient. The birds are the experts.

Evaluating the quality of the feathers and identifying molting disorders is helpful in determining how long the bird has already been experiencing health problems that have gone unnoticed by the owner. It is not unusual to conclude that birds showing respiratory problems are also experiencing feather and molting disorders—sometimes long before the owner makes an appointment for what seems like a sudden respiratory issue. In my experience, it is not uncommon for feather and molting disorders to have existed for years before the owner seeks help for respiratory problems.

Evaluating the diet and advising the owner to provide reliable and organic nutrition is the first and most important measure to both prevent and solve respiratory problems.

Obesity

Obesity can be considered another long-term outcome of malnutrition and a cause of respiratory problems. In my experience, during autopsies dealing with fatty livers and excessive fat accumulation in the coelomic cavity we can notice that the fat can also compromises the respiratory system by exerting pressure on the air sacs and the heart. Certain species are more vulnerable to obesity—Amazons, rose-breasted cockatoos, budgerigars (especially English budgerigars), lories, and eclectus parrots are examples.[11] I have never seen an African grey suffering from obesity. Providing reliable, organic nutrition is the most important approach to prevent and address obesity. In my experience, offering a high-calorie complete diet can lead to weight loss while simultaneously supporting muscle development. We often observe fat loss accompanied by muscle gain, which may result in an increase in overall weight due to improved muscle mass.

Lack of exercise

Parrots in nature are forced to be active to survive. Flying—and, for many psittacine species, climbing—are essential activities that ensure muscle strength, endurance, and overall viability. Parrots are also socially active. During the breeding season, they engage in a variety of behaviors, including courtship rituals. As prey animals, they must be constantly prepared to escape from predators. Another key natural behavior is perching on flexible, moving branches, which activates their muscles to maintain balance—even while sleeping. In the author's opinion, not providing flexible perches is a highly underestimated factor when keeping parrots in captivity. Lack of exercise, as in humans, is a cause of respiratory problems—especially during physical exertion or stressful situations. Creating opportunities for parrots to exercise helps prevent and resolve health issues, including those related to the respiratory system.[15,16]

Lack of sunlight

It is not uncommon in daily practice to encounter parrots suffering from a lack of sunlight. Some parrots are never taken outside, or only occasionally during the summer when the sun is shining. Owners are often afraid of cooler weather and may not realize that parrots in the wild experience vastly different climate conditions. For instance, in Africa and Australia, it can be very cold at night and extremely hot during the day, with a large temperature difference between night and day.[15] The negative consequences of a lack of sunlight are frequently underestimated. Sunlight plays a critical role in enabling birds to produce vitamin D. Vitamin D deficiency in African greys is a known cause of serious bone disorders, such as rickets. While preening, birds spread the oil produced by the uropygial gland over their feathers. The sebaceous material contains vitamin D precursors, which are converted to be the active form of vitamin D3 when exposed to ultraviolet light. During preening, the active form of vitamin D3 is ingested. African greys and other species, like macaws, have a patch of unfeathered skin around the eye to allow direct sunlight to reach the skin. African greys are known to forage on the ground in open spaces—very different from species like amazons, which typically dwell in the canopy and do not have a uropygial gland. Beyond the physical health implications, we must also acknowledge that outdoor exposure is a significant form of enrichment—no different than for children.[16] In human medicine in the Netherlands, we are familiar with the typical winter depression that affects people between October and April. A lack of sunlight can lead to serious mental health issues. Taking parrots outside as often as possible can therefore be considered a major preventive measure against both health and welfare problems.

Climate control

Climate control involves regulating temperature, humidity, and ventilation. It is crucial for the health and welfare of parrots—as well as other animals and humans. As a veterinary student, I was taught the critical importance of climate control in poultry.[17] In poultry farming, it is well known that proper climate regulation is essential for

preventing respiratory problems. As described by Dr. Fern Van Sant in her 1993 AAV conference presentation Seeing the Rainforest Through the Trees, we must consider the natural living conditions of parrots to understand their needs in captivity.[15,16] Budgerigars live in the desert environments of Australia, while amazons inhabit the tropical rainforests of South America—species with vastly different needs when it comes to temperature and humidity. Keeping a budgerigar in a centrally heated and air-conditioned home is not the same as keeping an amazon under the same conditions. It's no surprise that many respiratory problems are observed in Amazons and other birds kept as companion animals. Inappropriate climate conditions can be considered a major cause of respiratory illness. In general, outdoor climate conditions can be far better than those indoors—another reason to recommend taking parrots outside as much as possible. Another major aspect of climate control is ventilation. Ventilation prevents the circulation of fine dust and supplies fresh air. It also helps control humidity. In the wild, parrots—particularly rainforest species—are not exposed to circulating fine dust. Birds are adapted to the climate conditions of their natural habitats.[15]

Aerogenous toxins

Due to the efficiency of the avian respiratory system, parrots are highly vulnerable to airborne toxins. The famous example of canaries falling from their perches due to toxic gases in mines serves as a historical reminder—they saved miners' lives by acting as early warning systems. Toxic gases and airborne particulates in the environment can have destructive effects on the respiratory tract.[1,18] Especially dangerous are combinations of low humidity and circulating fine dust, strong fumes, cigarette smoke, or smoke from burning wood. These are all important risk factors.[1,3,12] I will never forget the case of an Amazon parrot presented with a sudden onset of severe respiratory distress. The bird entered the examination room gasping for air, sitting on the shoulder of its female owner. I immediately smelled strong fumes coming from the owner. When I asked when she had last been to the hairdresser, she explained that her daughter—a hairdresser—had done her hair the day before. The respiratory symptoms had started that same day.

Similar issues occur with fumes from scented candles and cleaning products used near the bird or its cage. Products containing ammonia or bleach are particularly problematic and can trigger respiratory distress. The most well-known and serious respiratory condition caused by an aerogenous toxin is exposure to polytetrafluoroethylene (PTFE). PTFE is found in various common home appliances with non-stick surfaces. When heated to 536°F (280°C), PTFE releases toxic fumes that can lead to sudden death. Air fresheners can also cause serious respiratory issues, as can candy cooking flavorings.[3] It is best to avoid exposing birds to any aerosolized substances to prevent respiratory problems.[1,3]

Egg binding

In practice, I have seen parrots present with respiratory problems, only to discover that the true cause was egg binding. In some cases, the owner could not believe the diagnosis, as the bird was assumed to be male and even had a male name. Diagnostic imaging (radiographs or ultrasound) may be necessary to confirm the presence of an egg to the owner. This serves as a reminder that respiratory symptoms are not always linked directly to the respiratory system itself. Other noninfectious causes of respiratory problems include internal tumors, cysts, hydrops, ascites, and hepatomegaly.[11]

Cardiac disease

Over the years, cardiac diseases, including atherosclerosis, have become typical captivity-related conditions in parrots and a common cause of a wide variety of clinical symptoms, including respiratory problems. Besides the difference between birds and humans, it makes sense to consider that atherosclerosis in birds can result from malnutrition, exposure to cigarette smoke, obesity, high blood pressure, lack of exercise, and a combination of

stress factors. I have learned from Prof. Peer Zwart to look for the similarities despite the differences between species. Malnutrition, lack of sunlight, lack and serious behavioral problems can all be considered stressors that may contribute to the development of cardiac disease. Lack of privacy is another well-known cause of stress in both humans and prey animals. Parrots, as prey animals, may experience significant stress when approached by humans who unknowingly display predator-like behaviors.[16,19,20] It is normal for parrots to have a higher blood pressure than mammals. This pressure increases during stressful moments or events.[12] Providing reliable, organic nutrition, along with creating an environment and social setting in which the parrot feels comfortable, appears to be an important preventive strategy.

Stress

Stress creates insecurity and negatively affects the immune system, making parrots more vulnerable to infectious diseases such as aspergillosis. In baby parrots, hand-rearing must be considered a significant stress factor. It is known to cause behavioral and welfare problems.[21] Stress increases blood pressure and respiratory rate.[11] Parrots in captivity face a variety of stressors. Living in a cage, unable to perform natural behaviors, can be a continuous source of stress and reduced welfare.[16] Not being acknowledged as prey animals, not acknowledging the need for privacy—and being approached or handled in ways that contradict their natural instincts—can be a serious stress factor.[22,23]

Conclusions

Noninfectious ailments can be considered the most common causes of respiratory issues in parrots. In my experience, a thorough questionnaire combined with a detailed physical examination are the most important tools for establishing a diagnosis. In general, a combination of factors is responsible for the development of respiratory problems. In daily practice, the most frequent causes remain malnutrition, inappropriate climate conditions and a variety of stress factors. These findings strongly support the need to focus on prevention by establishing tailored management protocols for different species to ensure the health and welfare of parrots in captivity.

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