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A Pictorial Overview of Diseases and Disorders of Budgerigars (*Melopsittacus undulatus*)

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A B S T R A C T

Budgerigar (*Melopsittacus undulatus*) is one of the pet birds frequently preferred by bird lovers for companionship throughout the world. Various investigations have been made into diseases and disorders of Budgerigars throughout the world; however, the reports pertaining to some of the disease conditions and their pictorial guide are not available for common veterinary practitioners in India. The present paper is a pictorial overview of some of the common diseases and disorders of Budgerigars and is highlights some of the laboratory findings. This elucidation will provide a baseline database on some of the existing disease conditions. This pictorial overview will also provide ready-to-use laboratory diagnostic referral images for veterinarians who will be encouraged to implement appropriate diagnostic and therapeutic strategies during day-to-day veterinary practice in future.

Introduction

The urban and rural belts of India have shown an increasing trend in bird-keeping during the last few decades. Bird rearing has also been observed in ancient Indian folklores. People keep different types of birds for various reasons such as their affection towards birds due to attractive characteristics (especially bird sounds, color variations, adaptable behavior, mimicking ability etc. in case of different psittacine birds); passion (e.g., variety of pigeons); as a pet/companion (believed to reduce anxiety and stress in humans); production purpose (e.g., poultry birds for egg and meat production); racing purpose (e.g., racing pigeons); superstitions (e.g., species of some birds used indoor due to superstitious beliefs and to perform various spiritual activities) etc. Indoor rearing of any type of birds demands special care and management. Irresponsibility in healthcare and management practices may lead to development of diseases in captive pet birds.

Out of all types of birds, Budgerigar (*Melopsittacus undulatus*) is one of the most commonly found pet birds after pigeons in rural as well as urban areas of India. This could be associated with various reasons such as their adaptable behavior, possibility of taming the bird, shorter egg-incubation period, attractive color variations, survivability in home environment, wide availability in market, less ability to mimicking human sounds and comparatively lesser cost of purchase etc.

Budgerigars also suffer from various types of diseases and disorders like other mammals, avian and reptilian species; however, there is no established pictorial guide on clinical ailments in Budgerigars. This lack of clinical information happens to be one of the reasons why veterinary practitioners are troubled while diagnosing and treating sick Budgerigars at their veterinary clinics. Considering such facts, an effort has been made by utilizing available resources to generate a pictorial overview of certain clinical ailments found in Budgerigars.

Pictorial overview of diseases and disorders of budgerigars

Different clinical ailments of Budgerigars and laboratory findings from biomaterials collected from Budgerigars are shown in Fig. 1 to Fig. 12.

The head region of Budgerigar comprises of eyes, ears, cere, nares, beak (upper and lower) and tongue. Eyes are the most important sensitive organs in the head region. Common ophthalmic affections in Budgerigars include mild to severe conjunctivitis with or without severe lacrimation, edema, suppurative discharge due to infectious conditions, eyelid deformities (e.g., partially opened eyelids, sticky/fixed eyelids), corneal opacity, eyelash affected by *Knemidocoptes* spp. of mite, pox-like lesions, ruptured eyeball due to severe traumatic injuries etc. (Fig.1). Minor ophthalmic and peri-ocular affections can be treated by use of topical and injectable medicines.

Septic conditions may warrant use of ophthalmic antibiotic drops and regular cleaning by use of soft cotton swabs soaked in lukewarm sterile water or normal saline. Minor surgical cases can be managed during general veterinary practice while management of some major traumatic conditions (e.g., damaged eyeball) is very difficult.

The cere is placed above the upper beak and it is used for sex differentiation in Budgerigars. The cere often gets injured/damaged during a fight between cage-mates or attack by predatory birds. Budgerigars with *Knemidocoptes* spp. infestation may also show deformed cere due to constant itching. Cere with chronic itching or damaged status may be presented with discoloration (Fig.2). Completely damaged cere may not affect breathing in most of the cases if nares are not blocked. Mild cases with bleeding and sepsis may require application of topical hemostatic, antiseptics and/or antibiotics. The condition may also require use of oral anti-inflammatory or pain-relieving agents.

The beak of Budgerigars may show various types of deformities depending on underlying etiology. Spilt beak, scissor beak, overgrown beak, injured/avulsed beak, congenital deviation, absence of upper or lower beak, soft beaks, tumour, roughening and peeling off upper layer due to *Knemidocoptes* spp. infestation etc. are some of the common beak deformities observed in Budgerigars (Fig.3). A budgerigar with frequent beak overgrowth should always be subjected to beak trimming on regular basis. Care must be taken to avoid bleeding and sepsis during the trimming process.

The crop, a part of digestive system, may get damaged in certain cases. Crop damage, tear, crop fistula, blockage etc. are some of the crop related issues observed in birds. Damaged but externally unexposed crop may appear as a swollen area near the neck region (Fig.4). A blockage in distal end of crop may also lead to development of a bulge/swelling in throat/neck region. Cranial air sac rupture also shows swelling in similar bodily regions; however, gentle palpation helps to differentiate crop damage from other conditions. Radiographic examination may also be conducted for differential diagnosis of air sac rupture, ruptured crop, blockage and presence of foreign body.

The cloaca in birds opens into vent for removal of excreta. Soiling of vent may indicate ongoing digestive or reproductive abnormalities in Budgerigars. Diarrhea, vent picking, vent abscess, injured vent, egg bound condition etc. can be observed in this area (Fig.5). Vent soiled due to apparently abnormal excreta may warrant examination of faecal sample/droppings to identify underlying bacterial or parasitic etiology. Injured vent or minor trauma can be managed by general veterinary surgical practices.

Budgerigars are prone to get injured because of various reasons. A fight between cage-mates, attack by predators, damage during manual handling, kite-string injury, damage due to improper enrichment materials placed in a cage, improper management practices, vices etc. can result in minor to severe traumatic injuries (Fig.6). Minor traumatic injuries can be managed by general veterinary surgical practices while major surgical interventions should be performed by using suitable anesthetic agents at standard and recommended doses.

Feather issues in Budgerigars are also commonly observed. Abnormal appearance of feather sometimes suggests an ongoing clinical ailment. Bacterial, viral, parasitic (e.g., feather mites), deficiency as well as managemental issues can lead to feather abnormalities (Fig.7).

Supplementation of vitamin A, vitamin E, Omega 3 fatty acid, amino acids etc. containing oral suspensions may be mixed with the diet or water on regular basis to maintain or improve feather quality.

Miscellaneous conditions such as arched back condition, nutritional or metabolic diseases (e.g., curled toe), splayed leg condition, congenital absence of toes or claws/nails, dehydration of unknown origin, ascites etc. are also observed in Budgerigars (Fig.8). Dehydration, starvation and emaciation often show sharp keel bone and reduced breast muscle mass. Ascites or hydroperitoneum can also occur due to an ongoing renal pathology such as tumors. Careful anamneses, detailed clinical examination, use of radiography or other advanced diagnostic modalities are important for differential diagnosis of various disease conditions. Symptomatic management may be adopted in such cases at a small veterinary clinic where advanced diagnostic modalities are not available.

Exhaustive literature on existing endoparasitic and ectoparasitic infestations in Budgerigars is not available in Gujarat and India. Ectoparasitic infestations are commonly observed in Budgerigars. Careful examination of skin and feathers while physical handling may reveal presence of lice and mite infestation. Clinical infestation by lice (e.g., *Menacanthus* spp., *Menopon* spp.) as well as mite (especially *Knemidocoptes* spp.) are more common as compared to tick and/or flea infestation in Budgerigars (Fig. 09, Fig. 10, Fig. 11). Knemidocoptic mange often shows excessive scaling and excoriations on head and legs. Cases diagnosed with clinical

ectoparasitic infestation can be treated with ectoparasiticidal drugs.

Besides ectoparasites, veterinary practitioners should also consider examination of faecal samples to diagnose endoparasitic infestation in Budgerigars. Some of the common endoparasites encountered in budgerigars included *Coccidia* spp., *Eimeria* spp., *Capillaria* spp., *Ascaridia* spp., *Strongyle* type, *Spirurids* and other worms (Fig. 11). Mild cases may not require exhaustive treatment while cases diagnosed with severe endoparasitism and diarrhea may warrant use of specific anthelmintics and supportive therapeutic measures.

Results and Discussion

Nowadays, Budgerigars are commonly found in household environments but, they are considered as exotic pets in India. They are not included in the 'Schedules' defined under the Wildlife (Protection) Act, 1972 in India. The International Union for Conservation of Nature (IUCN) has also included this species under 'Least Concern' category of species. Budgerigars are also found in zoos as part of *ex-situ* conservation in many countries. The overall healthcare and management of any pet depends on the knowledge level of owner and husbandry practices adopted by them. Any error in husbandry can lead to development of clinical ailments. Extensive investigations pertaining to existing diseases and disorders of Budgerigars have not been carried out in India.

Published literature from countries other than India mentions certain diseases and disorders such as psittacine beak and feather disease; inclusion body disease [Bemier *et al.,* (1981)]; infection by 'Megabacteria' [Moore *et al.,* (2001)]; tumor called 'keratoacanthoma' with appearance similar to squamous cell cancer [Owen *et al.,* (2007)]; leiomyoma or fibroid in oral cavity [Oana *et al.,* (2010)]; trichomonas, circovirus and clostridial infections [Ledwon *et al.,* (2011)]; leucosis and coligranuloma [Nouri *et al.,* (2011)]; thyroid hyperplasia or goitre [Loukopoulos *et al.,* (2015)]; osteoid metaplasia and cutaneous leiomyosarcoma [Timurkaan *et al.,* (2016)]; low-grade epithelioid hemangioendothelioma of subcutaneous tissues [Lanza *et al.,* (2019)]; xanthogranuloma of cutaneous tissues [Shokrpoor *et al.,* (2019)]; head and leg mange caused by *Knemidocoptes* spp. of mite [Abou-Alsoud and Karrouf (2016)], etc.

Fig.1 Ophthalmic affections in budgerigars

Fig.2 Cere damage ranging from a minor tear or complete avulsion affecting nares

Fig.3 Different beak deformities in budgerigars

Fig.4 Crop damage and cranial air sac rupture may show bulging around neck

Fig.5 Abscess, vent picking, dirty vent, egg bound condition etc. at vent

Fig.6 Minor to severe traumatic injuries which may prove fatal in some cases

Fig.7 Feather issues may appear as ruffled feathers, excessive pin feathers, French moult, loss of feather depending on etiological factor

Fig.8 Arched back condition, amputed or absent toes or claws, splayed leg condition, dehydration, ascites due to renal tumor observed in budgerigars

Fig.9 Examination of wing to detect presence of lice and mite

Fig.10 Infestation by *Knemidocoptes* spp. of mite is often found with drying of skin, scales, pruritus and sometimes bleeding from lesions mostly on face and legs

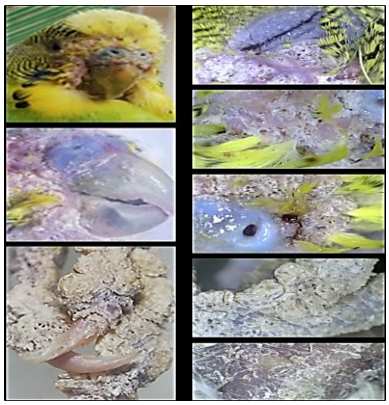
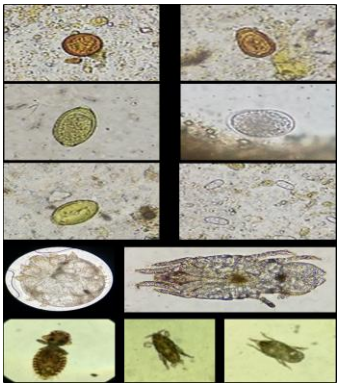


Fig.11 *Coccidia* spp., *Eimeria* spp., *Capillaria* spp., *Strongyle* type eggs, *Spirurid* spp. are common endoparasites while *Knemidocoptes* spp. of mite, feather mites and lice are ectoparasites observed in budgerigars



Published literature from India mentions existence of endoparasites in captive Budgerigars which include presence of *Eimerian* oocysts in Budgerigars at Sakkarbagh Zoo, Junagadh [Parsani *et al.*, (2000)], infestation by *Eimeria* spp. and *Ascaridia* spp. at Nandankanan Zoological Parkm, Orrisa [Sahoo *et al.*, (2010)]; and presence of eggs of *Capillaria* spp. in a zoo of Punjab [Moudgil (2015)], overgrown beaks and other beak deformities [Bhadesiya *et al.*, (2021)] etc.

The present paper highlights various ophthalmic affections, cere damage, beak abnormalities, crop affections, vent issues, injuries, feather abnormalities, lice infestation, mite infestation and laboratory diagnosis in Budgerigars. Similar exhaustive pictorial overview does not exist for Budgerigars in Gujarat and India as a single source. Veterinary practitioners should always prefer selection of appropriate drugs and doses as per standard recommendations (e.g., in textbooks) for different clinical diseases of Budgerigars.

Considering the above-mentioned facts, it can be undoubtedly said that Budgerigars suffer from various types of infectious and non-infectious health conditions. The present paper provides a ready-reckoner pictorial overview for veterinary practitioners who are frequently attending healthcare and managemental issues in Budgerigars.

In conclusion the budgerigars suffer from various types of infectious and non-infectious diseases and disorders. The present paper provides a pictorial guide on identification of some clinical diseases in budgerigars and some of the laboratory findings of veterinary significance. Veterinary practitioners can use such pictorial overview as a ready-reckoner for appropriate diagnosis and for implementation of specific planned therapeutic regimen. Similar exhaustive studies are required to be conducted for Budgerigars to explore other diseases and disorders.

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