Abstract

Cutaneous candidiasis involving the foot pads of 5-30 weeks old Japanese quails was recorded in a large quail breeding unit. Histopathological lesions comprising granulomatous reaction in the dermis and hyperkeratosis resembled with those of candida granuloma of human beings. The causative fungus, isolated from the foot pad lesions on Sabouraud agar, was identified as *Candida albicans* on morphological and biochemical characteristics. Predisposing factors such as overcrowding and un-sanitary conditions were found to be apparently responsible for candidiasis in quails. These factors when taken care of resulted in a marked decrease in the disease incidence. This appears to be the first report of cutaneous candidiasis in avian species.

Introduction

Candidiasis in birds is primarily a digestive tract infection involving frequently the crop and occasionally the mouth, esophagus, proventriculus, gizzard and intestine (1, 3). Perusal of available literature showed lack of information on cutaneous candidiasis in birds, although its occurrence in the swine (9) and dog (6, 7, 11) has been reported.

The present paper describes the pathological features of cutaneous candidiasis and isolation of *Candida albicans* from the foot pad lesions in the Japanese quail (*Coturnix coturnix japonica)*.

Materials and methods

Material for the present study was obtained from quails maintained in cages at the Central Avian Research Institute, Izatnagar. A total of 3 625 quails of different age groups were examined post-mortem for the presence of gross skin lesions, particularly in the unfeathered parts of the body and limbs. Tissues from 17 cases representing varying grades of lesions in the foot pad and hock joints were collected in 10 percent formal-saline, and processed for paraffin sectioning. Sections were cut at 4–5 μ thickness and stained with hematoxylin and eosin (H & E) stain. Periodic acid Schiff (PAS) and Gridley fungus stains were employed for demonstrating the fungus and MacCallum Goodpasture (MG) stain for presence of bacteria in the tissue sections (8).

Exudate from the foot pad and hock lesion and a 10 percent homogenized suspension of the morbid materials in normal saline solution were streaked on Sabouraud dextrose agar (SDA) and blood agar plates. After incubating the culture plates for 3–4 days at 37 °C, the growth on SDA was subcultured on corn meal agar (CMA) to demonstrate the formation of chlamydospores (2). The subculture was incubated at 20 °C for 2–3 days. Grams and lactophenol cotton blue stains were used to demonstrate the fungus in film preparations. Sugar fermentation reaction (12) using dextrose, maltose, sucrose and lactose was also studied.
Fig. 1. Enlargement of hock and mild swelling of foot pad. The foot pad lesion is covered with blood.

Fig. 2. Moderate swelling of foot pad. On left is an ulcer covered with a dark scab.

Results

Out of 1,589 quails of 5 to 30 weeks age, 80 (5.03 percent) revealed gross skin lesions in the foot pads and hocks. The clinically affected birds were unable to stand on their legs due to tenderness of the foot pads, were weak and emaciated and most often died as a result of starvation and dehydration.

Gross pathology

Gross pathological lesions comprised soft to hard swelling and ulceration of foot pads (Figs. 1 & 2). In a few cases, the swelling involved the shank, toes and tarsal and interphalangeal joints. The swelling in the foot pad was mild to moderate and the ulcerations often bled owing to vulnerability of the lesion to injury. The swelling in such cases was covered with dried blood. As the lesions became chronic, the ulcer healed and it was found to be covered by a small brown scab. The soft type of swelling on incision revealed greyish pink glistening surfaces with slimy to white mucoid exudate. Cases with hard swelling had pale caseous exudate which could easily be dislodged, leaving rough, lustureless and dry surface. Some of the cases revealed hard pinhead sized granular material embedded in the substance of the lesion. Table 1 illustrates the different grades of lesions and their incidence.

Microscopic pathology

The typical lesions in the foot pad were characterized by the presence of multiple granulomas, lymphocytic infiltration and lymphoid hyperplasia in the dermis, and hyperkeratosis and acanthosis in the epidermis (Figs. 3 & 4). The granulomas had within their necrosed centres a number of yeast-like cells which appeared as clear, round or oval bodies with light bluish cell walls in H & E stained sections (Fig. 5). The cellular reaction comprised infiltration of giant cells, lymphocytes and macrophages