

CONCURRENT INFECTION OF PNEUMOMYCOSIS, VERMINOUS ENTERITIS AND STAPHYLOCOCCAL BLEPHARITIS IN NATIVE CHICKEN FARM

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ABSTRACT

*Two 8-week old Aseel chicks were presented for necropsy from a native chicken farm with the history of swollen left eyelid, dyspnoea, off feed, dullness and sudden death. Gross examination of the carcasses revealed swollen left eye with cheesy exudate on incision. Lungs revealed severe congestion, with multifocal grey consolidated areas (1-2 mm diameter) while, the intestinal lumen was clogged by numerous round worms. Histopathological examination of lungs revealed multifocal granulomatous area with central necrosis, presence of macrophages, lymphocytes and multinucleated giant cells. Special staining with Periodic acid Schiff and Grocott-Gomori's methenamine silver stain showed the presence of fungal hyphae and spores in the lung lesions. The fungus was identified as *Aspergillus* sp. by cultural examination. Intestines revealed numerous cut sections of worms with eosinophilic and mononuclear cell infiltration and were identified as *Ascaridia galli*. Eye lesion had multifocal mild to moderate mononuclear cell infiltration with osseous metaplasia of scleral cartilage in eyeball. *Staphylococcus hyicus* was isolated from the eye exudate by cultural examination. Etiological diagnosis revealed an outbreak of *Aspergillosis*, *Ascariasis* and *Staphylococcal blepharitis* in the farm.*

Keywords: Ascariasis, Native Chicken, Pneumomycosis, Staphylococcal blepharitis

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Rearing Indigenous/native breeds of chicken play a vital role in rural areas, as an additional income and protein source (Mohapatra and Panda, 1981). *Aspergillus fumigatus*, a filamentous fungus with several factors, includes gliotoxin (GT), epipolythiodioxo piperazine molecule, with a major immunosuppressive property plays an important role in pathogenesis of aspergillosis

(Arne *et al.*, 2011). An impaired immune system is also an important risk factor in development of aspergillosis in both human and animals (Kunkle, 2003).

Earlier workers have reported that free ranging backyard chicken is highly susceptible to parasitic infection and due to their scavenging habits (Puttalakshamma *et al.*, 2008). *Ascaridia galli* is the predominant parasite identified followed by *Heterakisgallinarum*, *Raillietina cesticillus* and *Raillietina echinobothrida* (Katoch *et al.*, 2012). Poor nutrition and management cause poor growth rate, high mortality and loss due to predation (Conroy *et al.*, 2005)

The present report documents necropsy of two birds received from native chicken farm with flock strength of around 50 birds suffering 50% morbidity and 20% mortality over a period of one month. The clinical signs reported were off feed, intermittent dullness, diarrhoea, stunted uneven growth with a consistent mortality of one to two birds over a period of one month.

A detailed post mortem examination was conducted on the birds and gross lesions were recorded (Fig. 1 - 4). Representative tissue samples of lung, liver, intestine, eye, heart was collected in 10% formalin for histopathological examination. Formalin fixed paraffin embedded samples were cut into four micrometers thickness and stained by haematoxylin and eosin staining technique. Special stain like Grocott-Gomari methenamine silver stain and periodic acid schiff were used for viewing fungal hyphae in tissue sections. Ocular swabs and heart blood swabs were taken for cultural examination.

BIOMERIEUX VITEK 2 (a fully automated machine for bacteriological identification and antimicrobial testing was also used). The worms were collected from affected chickens and identified by cross sectioning.

Grossly, the lung was diffusely congested with greyish white foci. Liver was mildly congested and the intestinal lumen was packed with numerous *Ascaridia galli* worms. Cheesy exudate was seen on incision of the swollen eye.

The lung architecture was obscured by multifocal granulomas with central necrosis, surrounded by macrophages, lymphocytes and multinucleated giant cells. Special staining with Periodic acid Schiff and Grocott-Gomori's methenamine silver stain showed the presence of fungal hyphae and spores. Intestines revealed cut section of worms in the lumen with eosinophilic and mononuclear cell infiltration with epithelial cell hyperplasia. The worms were identified as *Ascaridia galli*. Multifocal mild to moderate mononuclear cell infiltration in the eyelid with osseous metaplasia of scleral cartilage in eyeball was observed. *Staphylococcus hyicus* was isolated from cheesy ocular swab. Antibiotic sensitivity test revealed resistance of these organisms to methicillin, erythromycin oxytetracycline and sensitivity to enrofloxacin, gentamicin and trimethoprim/sulfamethoxazole. Regular screening for Newcastle disease gave a negative result.

Aspergillosis can cause high morbidity and mortality especially in young chicks and birds (Arne *et al.*, 2011). Diffusely congested lungs with a grayish focus of 1.5 to 3.0 mm in diameter seen in this case was in accordance



Fig.1

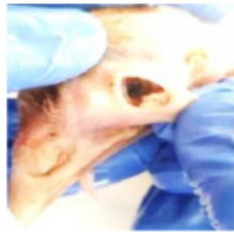


Fig. 2



Fig. 3



Fig.4

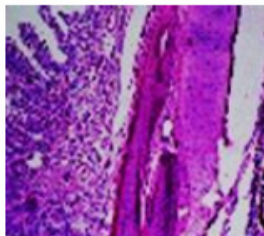


Fig. 5

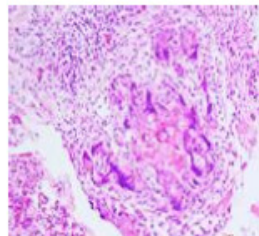


Fig. 6

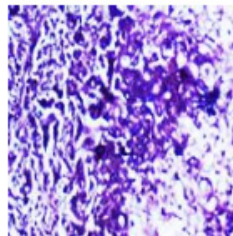


Fig. 7



Fig. 8

Fig. 1. Unilateral swelling of eyelid

Fig. 2. Cheesy exudate within eyelid

Fig. 3. Diffuse congestion with greyish white foci

Fig. 4. Duodenum impacted with worms

Fig. 5. Eye- Conjunctivitis along with heterophilic infiltration (scleral cartilage showing osseous metaplasia) showing congestion (intestine – cut section revealed tangled mass of round worms)

Fig. 6. Lung- granuloma (lung – giant cell seen within the granulomatous lesion) periodic acid Schiff stain

Fig. 7. Grocott-Gomori's methenamine silver stain- fungal hyphae and spores seen within the central necrotic area (black colour with pale green back ground)

Fig. 8. Intestine lumen with cut section of parasites showing crypt elongation and epithelial hyperplasia

with the report of Ahamad *et al.* (2018) who recorded diffuse congestion and multi focal grayish foci in lungs which were visible on cross section. Multifocal granulomatous area with central necrosis, presence of macrophages, lymphocytes and multinucleated giant cells and special staining with Periodic acid Schiff and Grocott-Gomori's methamine silver stain showed the presence of fungal hyphae and spores seen in this case were in accordance with that of Rahman *et al.*, (2014) who has recorded similar histopathological changes in broiler chicks. Puttalakshamma *et al.* (2008) reported that among 100 desi birds screened, 71 was found positive of gastrointestinal parasites by gross examination of gastrointestinal tract. Parasitism inflicts heavy economic losses in free-ranging chicken in rural areas in the form of anorexia, retarded growth, reduced weight gain, decreased egg production, diarrhoea, intestinal obstruction, immune suppression, morbidity and mortality (Anwar *et al.*, 1991; Shah *et al.*, 1999; Katoch *et al.*, 2012). Katoch *et al.*, (2012) reported that *Ascaridia galli* emerged as the most prevalent parasite followed by *Heterakis gallinarum*, *R. cesticillus* and *Rechinobothrida*. The histopathological changes associated with ascariasis in this case include several sections of adult *Ascaridia galli* worms seen in the lumen of intestine. Inflammatory hyperplasia of intestinal epithelium along with elongated crypt cells were in accordance with the findings of Gopal *et al.* (2017). *Staphylococcus hyicus* induced blepharitis in this case was reported earlier in chicken and turkeys by Cheville *et al.* (1988) who opined that *Staphylococcus hyicus* was the dominant agent in causing bacterial blepharitis and conjunctivitis. These findings highlight the importance of raising awareness

among farmers, about good farm management practices and deworming in backyard poultry to combat immunosuppressive conditions like *Aspergillosis*, nutrient depletion in *Ascariosis*, and localised infection such as *Staphylococcal* blepharitis, which can cause unnecessary morbidity and mortality.

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