



Occurrence of Systemic Mycosis in Broiler Chicken

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How to cite this paper: Aparna, K., Manaswini, P., Shaik, M., Ravikumar, Y., Sandhyarani, K., Swathi, B., & Lakshman, M. (2020). Occurrence of Systemic Mycosis in Broiler Chicken. *International Journal of Livestock Research*, 10(4), 102-105. doi:

<http://dx.doi.org/10.5455/ijlr.20191208060051>

Received : Dec 08, 2019
Accepted : Jan 14, 2020
Published : Apr 30, 2020

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Abstract

Mycosis is a common disease in poultry caused by Aspergillus spp. Route of infection is by inhalation of spores. Systemic mycosis occurs by spread of spores and hyphae through haematogenous route, lymphatics and by host cells. At necropsy, gross findings included multiple nodules in thoracic cavity, lungs, heart, air sacs and swollen kidneys. Cultural examination and staining revealed the fungal growth. Histopathological examination of lung with Periodic Acid Schiff stain revealed granulomatous inflammation with central caseous necrosis, mononuclear cell infiltration, epithelioid cells, giant cells with fungal hyphae.

Keywords: *Aspergillus spp*, Microbiological Examination, PAS, Poultry, Systemic Mycosis



Introduction

Mycosis is a common condition in poultry caused by *Aspergillus* spp. Which spreads to visceral organs resulting into systemic mycosis (Saif *et al.*, 2008). Inhalation is considered the main route of infection for *Aspergillosis* in birds (Oglesbee, 1997), because spores are too small to be trapped completely in the nasal cavity or trachea, some are able to reach the lungs and air sacs (Fedde, 1998). The air sacs are usually the primary site of infection, since inhaled air reaches the posterior thoracic and abdominal air sacs prior to contacting epithelial surfaces in the lungs (Nardoni *et al.*, 2006). Besides direct extension of the infection through the air sac wall, disseminated mycosis also occurs by haematogenous spread, Hyphae, which are known to be tissue and angio-invasive (Dahlhausen *et al.*, 2004), as well as host cells play a role in this spreading mechanism. Richard and Thurston (1983) studied and reported that the macrophages in the respiratory tract engulf the spores and find their way through the interstitium into the blood and lymphatic stream and thus reaches to other organs resulting in systemic mycosis.

Materials and Methods

The dead bird was examined and collected suspected samples for diagnosis. Lungs were severely affected and suspected of fungal infection. The lung tissue was submitted to microbiology lab for staining with lactophenol cotton blue (LPCB) and for cultural examination. Lungs collected in 10% formalin were processed and stained with periodic acid Schiff (PAS) stain (Culling, 1963) in the Department of Veterinary Pathology, College of Veterinary Science, Hyderabad as per the standard protocols.

Results and Discussion

Gross lesions observed were multiple grey to white coloured nodules of varied size (2-3 cm in diameter) in heart, lung, thoracic wall and air sacs (Fig.1). Kidneys were diffusely enlarged more than double of its normal size. On cut section of the tissues, greyish white caseous material was observed (Fig.2).

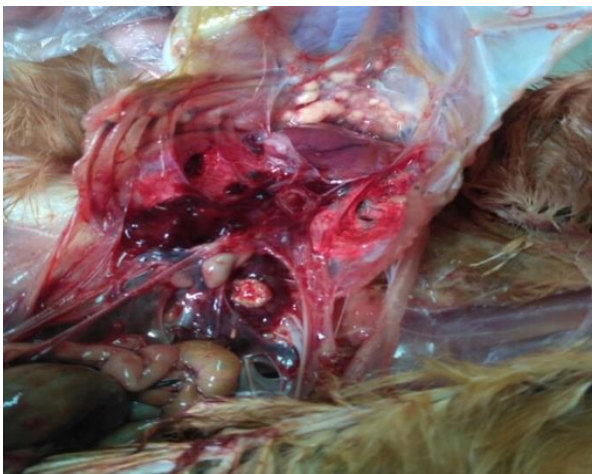


Figure 1: Multiple grey to white coloured nodules of varied size in the thoracic cavity.

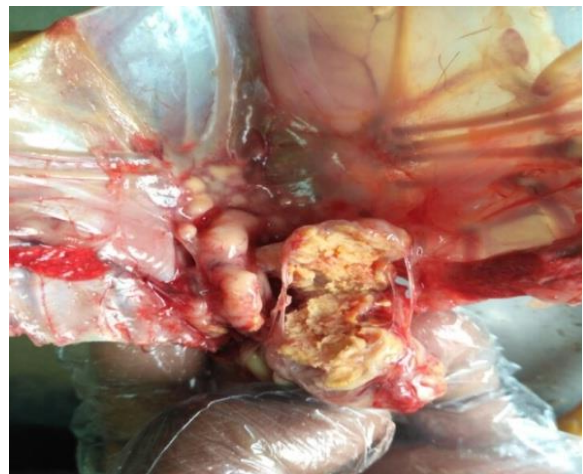


Figure 2: Section of the tissues revealing greyish white caseous material.

Sabouraud Dextrose Agar (SDA) is a selective medium primarily used for the isolation of fungi from suspected lung tissue. The culture plates were streaked with specimen and incubated at 25 – 30°C in an inverted position (agar side up) with increased humidity and examined after one week for the growth of fungus. After one week, fungal growth was observed in the culture plates (Fig.3) and the growth was subjected to lactophenol cotton blue (LPCB) staining and found the presence of *Aspergillus* spp., spores and hyphae (Fig. 4).

Microscopically, few sections revealed necrosis with infiltration of inflammatory cells with fungal hyphae (Fig.5), few sections revealed granuloma with central caseating necrotic foci, epitheloid cells and giant cells (Fig. 6). The findings of present study were in accordance with the results of Islam *et al.* (2009) Pascal *et al.* (2011) and Sawale *et al.* (2012).

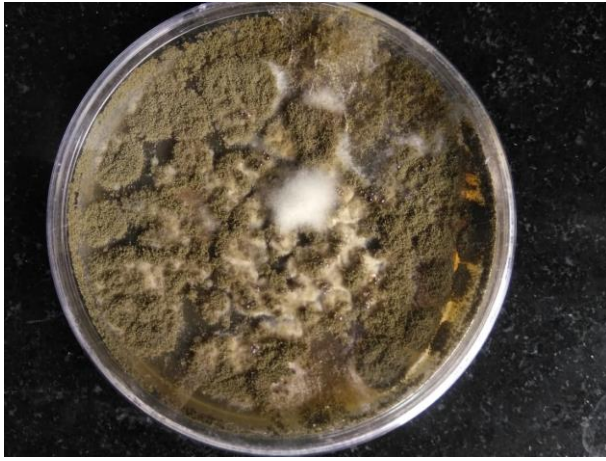


Figure 3: Fungal growth was observed on Sabouraud Dextrose Agar (SDA) from suspected lung tissue.

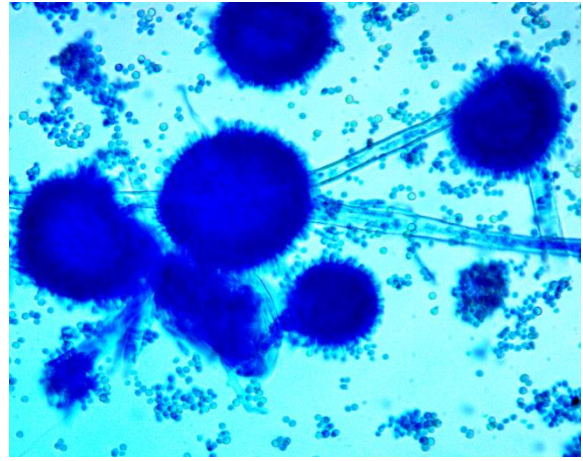


Figure 4: Lactophenol cotton blue (LPCB) staining revealed the presence of *Aspergillus* sps., spores and hyphae (Original magnification x100).

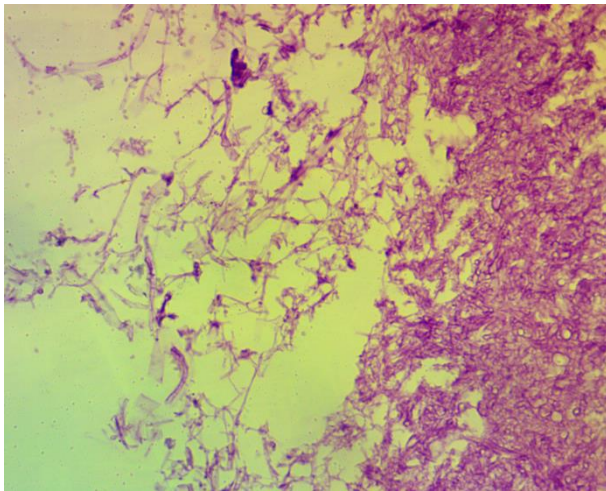


Fig.5: Photomicrograph of lung section revealed necrosis and presence of fungal hyphae. PASx400.

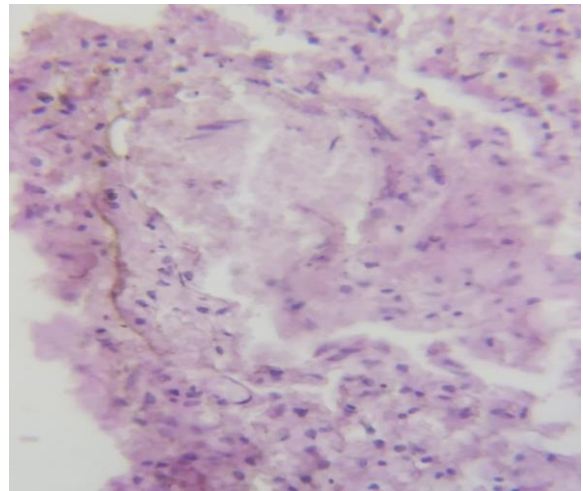


Fig.6: Photomicrograph of lung section revealed granulomatous inflammation with central caseous necrotic foci, epithelioid cells and giant cells. PASx400.

Conclusion

In conclusion, the present case report was diagnosed as systemic mycosis caused by *Aspergillus* sps. in broiler chicken by gross lesions like nodules in thoracic cavity, heart, fungal staining, cultural examination for fungal growth, histopathological examination with PAS staining.

Conflict of Interests

The author expresses no conflict of interest with any other individual or organisation regarding the information discussed in the manuscript.

Acknowledgments

Authors were highly grateful to PVNRTVU, Rajendranagar, Hyderabad for providing facilities to carry out present study.

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