

Aspergillosis in livestock

Mona S. Zaki¹, Nagw S. Atta² and Nagwa S. Rabie³

¹Department of Hydrobiology, National Research Centre, Cairo, Egypt

²Department of Microbiology and Immunology, National Research Centre, Cairo, Egypt

³Department of Poultry Diseases, National Research Centre, Cairo, Egypt

dr_mona_zaki@yahoo.co.uk

Abstract: The clinical signs such as dyspnea, gasping, cyanosis and hyperemia are usually associated with the disease. However, the affected birds normally don't produce respiratory noise associated with other respiratory problems. Moreover, Aspergillosis primarily causes high morbidity and mortality especially in young chicks. Aspergilli can be isolated from environmental samples and are worldwide in distribution due to the spores of these fungal pathogens are resistant in nature and the birds as well as people who work with them, coming in contact with spores through contaminated feed or litter and may get affected after inhaling the spores. Poultry farm workers are at high risk of developing respiratory problems as they are exposed to high levels of dust containing Aspergillus spores during handling and processing of contaminated material.

[Mona S. Zaki, Nagw S. Atta and Nagwa S. Rabie. **Aspergillosis in livestock (Review)**. *Stem Cell* 2017;8(1):1-2].
ISSN: 1945-4570 (print); ISSN: 1945-4732 (online). <http://www.sciencepub.net/stem>. 1.
doi:[10.7537/marsscj080117.01](https://doi.org/10.7537/marsscj080117.01).

Keywords: Aspergillus, fungal infections, morbidity

Invasive fungal infections (IFI) are serious infections and often life threatening and remain an important cause of morbidity and mortality among immunocompromised patients. The most common invasive fungal infections include invasive candidiasis, aspergillosis and cryptococcosis.

Invasive aspergillosis is caused by *Aspergillus fumigatus* and other *Aspergillus species*. Being an abundant component of inhaled air, this organism represents one of the leading causes of IFI-related morbidity and mortality.

Galactomannan (GM) is a polysaccharide consisting of a mannose backbone with galactose side group which is a component of the cell wall of *Aspergillus spp.*, that is released into the blood stream by growing hyphae and germinating spores and conidia. The detection of galactomannan in serum is used to diagnose invasive aspergillosis in human through ELISA assay.

On the other hand, several species of *Aspergillus* produce toxins which have various effects such as Aflatoxins that are carcinogenic and cause hepatic and kidney damage or chronic damage of human bones. The diagnosis of *Aspergillus* infection presents considerable difficulty as the signs and symptoms in most cases of Aspergillosis are non-specific, and radiological findings are of little diagnostic help, so the diagnosis of Aspergillosis requires the isolation and identification of the fungus. Serologic assays are now being developed as an attempt to allow for the rapid and specific diagnosis of *Aspergillus* infections.

Signs are physical manifestation of a disease condition. Common signs associated with Aspergillosis infection include difficulty with breathing in which forced or labored breathing may occur. There may be increased thirst, fever, diarrhea, blindness and inflammation of the brain and membranes surrounding the brain may occur in the later stages resulting in increased morbidity and mortality. What are the health implications of *Aspergillus*? *Aspergillus spp.* can cause disease in birds and man. Three different disease states are observed in man:

(i) Infections that can arise from the weakening effects of aspergillosis e.g. colonization of lung cavities due to tuberculosis, neoplasms or new growths in lungs and kidneys. Almost any organ or system in the human body may be involved. Onychomycosis, sinusitis, cerebral aspergillosis, meningitis, endocarditis, myocarditis, pulmonary aspergillosis, osteomyelitis, otomycosis, endophthalmitis, cutaneous aspergillosis, hepatosplenic aspergillosis, as well as *Aspergillus fiingernia*, and disseminated aspergillosis may develop. Nosocomial occurrence of aspergillosis due to catheters and other devices is also likely. Construction in hospital environments constitutes a major risk for development of aspergillosis particularly in neutropenic patients.

(ii) Allergic reactions to *Aspergillus spp.* e.g. allergic bronchopulmonary aspergillosis.

(iii) Toxic reactions occur as a result of toxins produced by *Aspergillus* spp. e.g. mycotoxins such as aflatoxin which are carcinogenic and may induce hepatocellular carcinoma or liver cancer.

Pulmonary aspergillosis is the most common clinical manifestation of aspergillosis. The, most common symptoms of pulmonary aspergillosis are a chronic productive cough and hemoptysis [coughing up blood]. According to a standard medial textbook, "Aspergillus can colonize ectatic bronchi, cysts, or cavities in the lung. Colonization is usually a sequel of a chronic inflammatory process, such as tuberculosis, bronchiectasis, histoplasmosis, or sarcoidosis. A ball of hyphae may form within an air-containing space, particularly in the upper lobes, and is termed an aspergilloma. The fungus rarely-invades the wall of the cavity, cyst, or bronchus in such patients". It is not clear what role *Aspergillus* plays in non-invasive lung disease. Plugs of hyphae may obstruct bronchi. Perhaps allergic or toxic reaction to *Aspergillus* antigens could cause bronchial constriction and damage.

References

1. Penack, O.; Rempf, P.; Graf, B. et al. (2008). *Annals of Oncology*, 19: 984-9.
2. Choi, S.H.; Kang, E.S.; Eo, H. et al. (2013). *Pediatr Blood Cancer*, 60 (2): 316-22.
3. Jha, A.K.; Bansal, D.; Chakrabarti, A. et al. (2013). *Hematology – Oncology*, 49 (2): 119-29.
4. P. N Acha, and Szyfres B. 2006. "Aspergillosis" 3 rd Ed.(1), 305-310.
5. Saif and F. A. Aboul khier 1979. *J. Egypt. Vet. Med. Assoc.* 39(3): 139-153.
6. D. D. Pattron 2006: *Internet Journal of food safety* 8:19-23 [10].
7. Bennett, J.E. 1979a. Aspergillosis, pp. 546-547. In P. Beeson, W. McDermott, and J. Wyngaarden, (eds.), *Cecil textbook of medicine*, 15th edition. W.B Saunders, Philadelphia.
8. Bennett, J.E. 1980. Aspergillosis, pp. 742-744. In K.J. Isselbacher, R.D. Adams, E. Braunwald, R.G. Petersdorff, and J.D. Wilson (eds.), *Harrison's Principles of Internal Medicine*, McGraw-Hill, New York.

12/18/2016