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Diagnosis of Avian Pathology in the East of Algeria

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Abstract: The diagnosis requires a background of current knowledge in the field and also complementary means in which the laboratory occupies the central place for a better investigation. A correct diagnosis allows to establish the most appropriate treatment as soon as possible and avoids both the economic losses associated with mortality and growth retardation often observed in poultry further more it may reduce the high cost of treatment. Epidemiologic survey, hematologic and histopathologic study's are three aspects of diagnosis heavily used in both human and veterinary pathology and the advanced researches in human medicine would be exploited to be applied in veterinary medicine with given modification. Whereas, the diagnostic methods in the east of Algeria are limited to the clinical signs and necropsy finding. Therefore, the diagnosis is based simply on the success or the failure of the therapeutic methods (therapeutic diagnosis).

Key words: Chicken, diagnosis, hematology, histopathology

INTRODUCTION

Poultry is the only strategic sector that can meet the nutritional needs of animal protein and reducing the cost of meats importing bills, poultry farming occupies the first place as a source of animal protein in areas where livestock of other pets is difficult. However the expansion and development of this sector faces several challenges, such as installation and proper management of these farms without forgetting the good support for early, rapid and accurate diagnosis based on further tests.

The diagnosis is the key to success of any treatment both human and animal pathology and any mistake can lead to fatal consequences. Early diagnosis can limit or even avoid substantial economic losses by reducing the cost of treatment and decreased morbidity and mortality of livestock. Our study suggests the introduction and popularization of rapid diagnostic methods in avian pathology in the eastern area of Algeria, which suffers from under-diagnosis. This study was also aims to investigate about the sanitary situation of avian breeding.

MATERIALS AND METHODS

Epidemiological survey on the dominant poultry pathology is essential step to know the current situation of our poultry sector and focus research on the disease that causes more economic losses and need early intervention to reduce these losses.

This survey has been made-up in the form, of questionnaire sent to veterinary surgeons in the east of

Algeria, to collect information on the diagnosis methods, the management, vaccination protocols and detection of most important poultry diseases.

In the laboratory blood samples then smears were spread and fixed on site then stained for hematological studies which aim for differential counting, reticulocyte counting, erythrocytes and leukocytes morphology and other tests. Other techniques may be considered as morphometry and the study of the size of cellular elements of blood. Punctures of biological liquids can be used for examination to confirm or refuse a suspected pathology.

Biopsies, punctures or fragments of organs are taken from the living animal or just after its death, set in a formal (10%) in order to avoid post-mortem changes (Gridley, 1960) and sent for histological study in Agroveterinary institute of Souk Ahras (Algeria).

The achievement of blades for histological examination was made according to the technique described below; a successive passage through the different compartments of the automaton, whose goal is dehydration (passages in alcohols of different degrees), the clarification (xylene) and impregnation (infiltration) in paraffin (Bennoune, 2011). The residence time of the fragments in the automaton is 24 h. blocks were then cut to a thickness of 5 μ using the microtome (MIC 509, Euromex, Japan) and then subjected to staining with H and E for histopathological studies (Luna, 1968).

Electrophoretic studies of serum and ELISA may be used for diagnosis or for comparative studies of techniques.

RESULTS AND DISCUSSION

A meticulous analysis of the survey results shows the frequency of several pathologies of bacterial, viral and parasitic origins. Indeed, this survey has revealed the veterinarians do not apply the manufacturer's recommendations on the use of vaccines.

Diagnosis in Avian Pathology involves several steps includes a search for possible failure of the breeding system, also an external examination of animal (clinical signs) and necropsy to determine the cause of bad performance, or mortality by examination of tissues and organs and get the best samples for serological, histopathological, microbiological tests or even animals inoculations (Bermudez and Stewart-Brown, 2008). Samples represent the starting point for the diagnosis in animal pathology, samples can be taken from animals or environment, for purposes like the diagnosis of disease, disease surveillance, or following up on response to treatment or vaccination.

In Avian pathology, most birds showed no clinical signs during the initial phase of the disease. Therefore, diagnostic methods, such as hematology, can provide insight on the value of an individual's health status before clinical signs appear and allow early intervention to curb the disease (Clark *et al.*, 2009).

In addition to this hematology and histopathology are two aspects of diagnosis heavily used in both human and veterinary pathology. Hematology is a major component of veterinary practice because the interpretation of avian blood cells provides a lot of information to guide diagnosis. Practitioners must be able to identify normal morphology and cell function to interpret all types of changes (Mitchell and Johns, 2008). Evaluation of avian blood count has now become a useful way in the diagnosis of avian diseases (Campbell, 1995). In the other hand histopathology, by the practice of autopsy in avian pathology, helps to understand the sequence of symptoms and the cause of mortality in breeding.

This study was performed on bursa of Fabricius of broiler chickens taken from barns located in the town of RAHBET, the latter is known to be Gumborogène (Khenenou, 2008). The microscopic results showed the presence of interfollicular edema and lymphocytes necrosis of some medullary bursal follicles (Fig. 1).

The evolution constantly in scientific research has dramatically changed the methods and choices of diagnostic techniques of some diseases, such as avian coccidiosis is now possible due to recently introduced technology in this area and to determine not only the species in question but also its genetic variation which represents a significant step towards a better prevention and control of the disease (Morris and Gasser, 2006) and for avian influenza there are rapid and recent tests used during epidemics or monitoring H5N1 virus (Chen *et al.*, 2008; Chen *et al.*, 2010).

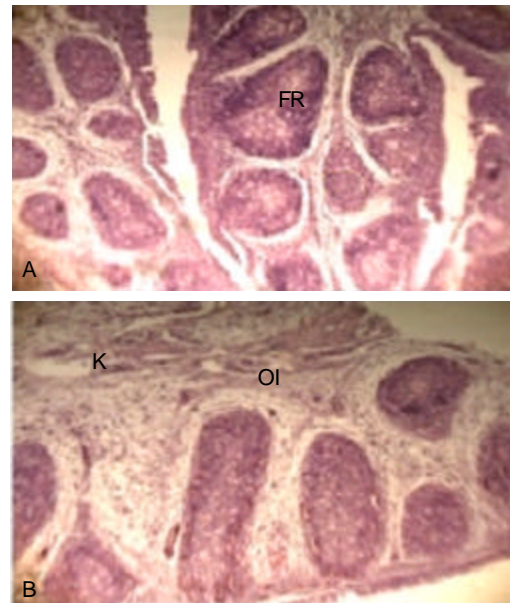


Fig. 1: Histological aspect of bursa of Fabricius of broiler chickens during Gumboro disease. (A) 25th day of posthatching age; interfollicular edema, follicular degeneration (H and Ex100) and (B) 26th day of posthatching age; lymphocytic depletion phase, bursal follicles show many gaps (H and Ex100). FR: Follicle regressed, K: cyst, OI: Interfollicular Edema

The execution of additional diagnostic testing is also aims to reduce economic losses and avoid tedious tests even counting *Eimeria* oocysts can be done with the standard McMaster technique (Haug *et al.*, 2006). Whereas, the diagnostic methods in the east of Algeria are limited to the clinical signs and necropsy finding. Therefore, the diagnosis is based on the success or the failure of the therapeutic methods.

Conclusion: This study's aims to solve a big problem in avian diagnosis in east of Algeria and has a direct impact on the development and improvement of animal production. In addition this project introduces new techniques and modern rapid ultra sensitive methods for an accurate diagnosis in poultry sector which combines a huge delay in diagnosis and improved performance of poultry farms and reducing economic losses also reduced time-necessaries for the diagnosis and direct impact on the effectiveness and cost of treatment.

In addition to the above impacts this project contributes to install a functional research unit with recent rapid diagnostic techniques in avian pathology. To acquire and update knowledge of rapid diagnosis, cooperation with research centers and research laboratories specializing in this field is more than necessary.

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