قسم : الباثولوجيا
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رئيس القسم : أ. د . محمد ابراهيم الشرى.

دراسات عن حدوث الالتهاب الشمسي النموي
في عجل التسمين ، في أسيوط - مصر

2- دراسات مورفولوجية وميوكروفسيولوجية

عبد اللطيف بيومي ، على السيامي ، صلاح ديب ،
أحمد عامر ، محمد صلاح الدين

أجري البحث في منطقة أسيوط على عدد سبعية عشر رأسا من
عجل التسمين الجاموسي النافقة والتي كانت قبل وفاتها عليه
أعراض مرضية في صورة كحاء وافرازات مخاطية من الأنف وقد رجّت
متفاوتة من الحمى وارتفاع درجات الحرارة.

عند التشريح المرضي امكن تشخيص الالتهاب الرئوي المتفاوت
الدرجات في جميعها وتأكدت النتائج بالفحص الميوكروسكوبى
للعينات المأخوذة وقد نوقشت النتائج المورفولوجية والميوكروسكوبية
ومدى تطابقها مع نتائج الفحص الفيروسى (في معامل مدنية
جنس بألمانيا الغربية) والتي أشار إليها في البحث رقم (1).
Depts. of Pathology and Animal Medicine,
Faculty of Vet. Med., Assiut University,
Head of Depts. Prof. Dr. M.I. El-Sherry, & Prof. Dr. I.H. Sokkar.

INVESTIGATION ON AN OUTBREAK OF ENZOOTIC BRONCHOPNEUMONIA IN FATTENING BUFFALO-CALVES IN ASSIUT, A.R.E.
II. MORPHOLOGICAL AND MICROMORPHOLOGICAL STUDIES
(With 4 Figs.)

BY
A.H. BAYOUMI; A. EL-SEBAIE; S. DEEB; A.A. AMER
and M.S. YOUSSEF
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SUMMARY

Postmortem and histopathological examinations were carried out on seventeen dead buffalo-calves obtained from an outbreak of respiratory distress in Assiut province. Morphological and micromorphological examinations revealed respiratory tract affection could be diagnosed as enzootic bronchopneumonia.

INTRODUCTION

Aetiologically, respiratory affection in cattle is a complex syndrome involving stress factors, bacterial and viral infections or combined effect (COLLIER et al. 1960; LEHMUKUHL and GOUGH, 1977; BREYSON et al. 1979; PIRIE, 1981 and AL-DARRAJI et al. 1982).

Atypical pneumonia in fattening calves including giant cell type and cuffing type are described by (JARRETT 1956; BETTS et al. 1964; OMAR et al. 1966; LAMONT et al. 1968 and COLE 1971).
In Egypt giant cell pneumonia was described by MOUSTAFA et al. (1975).

In the present study, an outbreak of enzootic bronchopneumonia in Assiut province was studied from the clinical, aetiological, haematological and morphological points of view. The clinical, aetiological and haematological methods and results were published by EL-SEBAIE et al. (1983).

MATERIAL and METHODS

Seventeen dead buffalo-calves with an average body weight of 150 kg and age of 9-12 months were collected from an outbreak of respiratory distress in Assiut province and were subjected to morphological and micromorphological studies.

Necropsy of those calves was performed as soon as possible after death. The different organs were carefully examined. For histological preparations, tissue specimens from the trachea, lung, liver, kidney, heart intestine, spleen and brain were fixed in 10% neutral buffered formalin. Paraffin sections were prepared and stained with haematoxylin and eosin. Differential stains used included turnbull blue method, ferric ferricyanide method and Mallory trichrome stains.

Bacteriological, serological and haematological methods and results were published by EL-SEBAIE et al. (1983).
RESULTS

Macroscopic findings:

In all cases, the most significant lesions developed in the respiratory tract. The mucosa of the entire nasal tract was congested, swollen and in few cases contained petechiae. Fibrinopurulent exudate, which was loosely attached to the surface of the mucosa and partially occluding the meatuses, was also observed. Moreover, mucopurulent exudate was seen in the palatine and maxillary sinuses. The mucosa of the pharynx and larynx were hyperaemic, whereas mucopurulent discharge, occasionally tinged with blood, was seen in the trachea and bronchi. In the lung, areas of pneumatic consolidation associated with areas of atelectasis and others of emphysema were observed. The consolidated areas were sharply demarcated from the healthy lung tissue and appeared granular, red to dark red or even greyish brown in colour. When the cut surface was squeezed, mucopurulent exudate escaped from the bronchi and bronchioles. In four cases, dense adhesive pleuritis accompanied with multiple subpleural focal suppurations in the cardiac and apical lobes were demonstrated. The abscesses were of different sizes, up to hazel nut sized abscesses, and were usually surrounded by pneumatic foci. The bronchial lymph nodes were usually enlarged, congested and oedematous.

Examination of other organs revealed that, the pericardium was oedematous, opaque and the pericardial sac was mostly distended with thin transudate; in five cases, fibrinous pericarditis was observed (Fig. 1). Petechial and ecchymotic haemorrhages were present beneath the epicardium and also subendocardially. The heart muscles were flabby. The small intestine showed mild to severe catarrhal enteritis; its serosal vessels were congested. The liver was congested, sometimes was markedly enlarged, with rounded borders and appeared pale yellow. Only in three cases focal white necrotic foci could be observed in the right lobe of the liver. The kidneys were congested and slightly enlarged.

Microscopic findings:

Microscopical examination of the lung revealed different pictures of inflammatory processes. The latter varied not only in severity but also in extent and nature from animal to animal and even from one area to another in the same animal. The principal microscopic feature consisted of exudative and proliferative reactions associated with necrotic areas. The latter were present side by side with the inflammed lung tissue. Suppuration and abscessation were seen in four cases.

The exudative reaction was manifested by aero fibrinous cellular bronchopneumonia with atelectasis and emphysema. The main cellular inflammatory reaction in the alveoli consisted of infiltration of neutrophils and mononuclear cells. The exudative process involves also the interstitial tissue by which the interfleural septa were thickened due to congested vessels, accumulations of serous or fibrinous exudate and cellular infiltrations. These were associated with areas of alveolar haemorrhages and muce-purulent bronchopneumonia. Vascular degenerative changes, perivascular oedema and areas of sequestrations were also observed.

The proliferative reaction consisted of peribronchial lymphocytic hyperplasia forming either separate nodules or associated with histiocytic cellular proliferations. Cellular proliferation of the wall of the bronchi and bronchioles, (Fig. 2), mostly lead to narrowing or occlusion of their lumens. Many macrophages and giant cells were seen in the alveolar lumens (Fig. 3). The proliferative reaction was also observed in the interstitial tissue in the form of great thickening due to proliferative septal cells, large macrophages and fibroelastic proliferations (Fig. 4). The latter was also

observed around the suppurrative and necrotic foci. The pleura in six cases showed chronic inflammatory processes. Perivascular round cell accumulations were also observed. Focal necrobiotic changes could be observed in the lymph nodes draining the respiratory tract.

Examination of the liver revealed degenerative and necrobiotic changes ranged from cloudy swelling to fatty change. In some cases mild proliferation of reticuloendothelial cells could be seen. Neither intercellular oedema nor leucocytic infiltrations could be observed.

The kidneys revealed slight nephrotic changes in most of cases. The heart showed variable degrees of myocardiosis; in some cases intermyocardial congestion and haemorrhages could be observed. Examination of the intestine revealed mild catarrhal enteritis associated with necrotic changes in the tips of their villi. No changes were observed in the spleen. In the brain meningeal vascular congestion was observed.

DISCUSSION

In our findings, the lung revealed different pictures of inflammatory processes. The latter varied not only in severity but also in extent and nature from animal to animal and even from one area to another in the same lung. The principal features observed were mixed exudative and proliferative reactions associated with necrotic areas. The latter appeared partly infarctive in origin and partly true tissue destruction. The exudative process was represented by serofibrinous and cellular bronchopneumonia with atelectasis and emphysema. The proliferative reaction was seen in the air passages, alveoli and interstitial tissue. Moreover, suppuration and abscessation were common in the lung tissue.

It is known that many infectious agents are associated with pneumonia in cattle; these include Pasteurella haemorrhagica and multocida (ALLEY, 1975; GILMOUR, 1978; BREYSON et al. 1979; CHAUDRASEKARAN and CHUNK, 1981), BEDSONIA and CHLAMYDIA (PHILLIP, 1968), PI-3 virus (FRANK and MARSHALL, 1973), adenoviruses (MOHANTY et al. 1973), respiratory syncytial virus (JACOBS and EDINGTON, 1975), rhinoviruses (MOHANTY et al. 1969), and revovirus (LAMONT et al. 1968; PHILLIP, 1970). In the present study, the affected animals in this outbreak were proved to be serologically positive for PI-3, IBR and BVD viruses (EL-SEBAIE et al. 1983). Moreover, Pasteurella was isolated from nasal swabs and morbid materials. Hepatization, accumulation of serofibrinous exudate, catarrhal bronchitis and bronchiolitis as well as serofibrinous pleurisy observed in the respiratory tract are all a characteristic lesions of Pasteurellosis. However, a combination of previous viral infection and stressors may have played a role. Lesions related to viral infection in the present cases may be overshadowed by the severity of changes induced by bacterial invasions and the primary role of Pasteurella can not be emphyasized. Mixed infections of PI-3, IBR and BVD viruses are not uncommon in young cattle (WHITE and FISHMAN, 1972). Interstitial proliferative inflammation of the lung tissue observed in our materials resembled, most probably, an old bacterial or viral infections occurred earlier.

The necrobiotic changes seen in the lymph nodes draining the respiratory tract could be attributed to either the direct effect of the aetiological agents or indirectly due to the bacterial toxins. The degenerative changes seen in the parenchymatous organs could be considered as secondary lesions.
REFERENCES


Fig. (1): Showing pneumatic consolidations and fibrinous pericarditis

Fig. (2): Bronchiole showing proliferation of its epithelial lining. H&E. X 25 x 12.5
Fig. (3): Lung showing giant cells in the alveolar lumens. H&E. X 40 x 12.5

Fig. (4): Lung showing proliferative reaction in the interstitial tissue. H&E. X 16 x 12.5