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STUDIES OF OVINE RESPIRATORY INFECTIONS IN IRAN WITH EFFICACY OF INJECTABLE LINCOCIN & LINCO-SPECTIN

By:

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Summary:

Outbreaks of ovine respiratory disease occured in nine flocks of sheep in Iran, during May to September 1978.

The affected animals consisted of young, native lamb 4-7 months of age. 1328 lambs amongs 7388 sheep died during the outbreaks. The disease was characterized by high fever dyspnea, anorexia, nasal and lacrimal discharge. Fibrineous pneumonia, pleuritis and pericarditis were evident at necropsy. Mycoplasma Sp. Pasteurella multocida, Pasteurella haemolytica, Corynebacterium pyegenes and E. Coli have been isolated from the cases.

Nine groups of animals each group consisting 12 moderately affected lambs were selected and treated by injectable Lincocin and Linco-spectin, all animals in 9 medicated groups recovered, while the mortality continued in unmedicated lambs.

Introduction:

Sheep and goats respiratory infections are the disease of major importance to the ovine and caprine industry throughout the world. Pasteurella multocida, Pasteurella haemolytica septicemia, Corynebacterium pyogenes, Mycoplasma SP. (PPLO), and Chlamydial agents have been isolated from pneumonic complex

cases (1–5), (7–15). The disease causes death loss, poor weight gain, loss of meat production due to poor feed utilization and failure to pass required meat inspection standards (12). Sheep and goat respiratory infections are observed both in young and adult animals, but greater losses are observed in younger ages. Formolized tissue vaccine, bacterins and various chemothrapeutic substances like antibiotics have been used for prevention and treatment in sheep (7,8,12), it has been reported that an antibiotic preparation was effective to reduce mortality rate and pneumonia in lamb. (Hamdy, et al) (8).

Antibiotic therapy appeared to have beneficial effect against microbial infections in sheep, (8). The objectives of this paper is to report the results of our studies on the disease in Iran and the therapeutic effects of injectable Lincocin and Linco-spectin in treatment of sheep and goats respiratory infections.

Materials and Methods:

Sources of animals; Outbreaks of pleuropneumonia occured in nine flocks of lambs (Fig. 1–2) during May to September 1978 in different parts of Iran, the flocks were located in provinces of the south central state of Lorestan and Eastern state of Khorasan. The affected animals were 4–7 months, male and female, native breeds. 1328 lambs died during outbreaks from 7388 lambs of nine different flocks. (table 1) is presenting the feature of the disease and mortality due to Pleuro-pneumonia.

Area name	Management System	Number of animals in flock	Mortality rate	Morbidity rate	Diagnosis
1– Azna	Private				
2– Shirvan	Governmental	1000	600	380	Pleuro-pneumonia
3– Tirgaran	»	950	150	50	»
4– Doroud	Private	1000	200	55	»
»	»	320	150	25	»
»	»	900	600	200	»
7– Aligodarz	Governmental	1000	500	130	»
8– Sooran Ghaleh	Private	1500	750	300	»
9– Mohammad abad Ilkhani	»	118	50	8	»
Total		7388	3400	1328	

All areas except 9th. area are located in south central state of Lorestan, 9th. one is located in Eastern state of Khorasan.

Specimenes for Bacterial Isolation;

Heart blood, liver, lung and bone marrow tissues were cultured in sterile condition in nutrient broth and beef heart infusion (Difco), cultures were incubated at 37°C for 24 hours. Subcultured on blood agar, Mac Conkey agar medium showed Smooth, shiny and very small colonies after 24 hours, for identification of the isolated bacteria following medium were used.

For fermentation tests, the basic medium consisting of peptone water containing beef extract (0.5%) and bromothymol blue as indicator, the desired carbohydrate was added to make a final concentration of (0.1%). The gelatin, MR–VP (BBL), medium, Triple sugar Iron (TSI) agar were used respectively for gelatin liquifaction,Voges proskauer and Methyl red reaction, H2S production, Nitrate, Indole and Citrate formation tests. Pasteurella Multocida, Pasteurella Haemolytica, E. Coli and Corynebacterium Pyegenes were isolated from infected sheep.

Specimens for Mycoplasma isolation,

Isolation of mycoplasma was based upon inoculation of either ground lung tissues or excess fluids that were collected from thoracic cavity in mycoplasma broth (Difco W/O CV Medium) enriched with 20% normal sterile horse serum, 1% yeast Extract (BBL) and 500 I U of Penecillin G per ml to prevent bacterial contaminations. After 48 hours, the cultured medium was passed through 0.45 um membrane filter to cut down contamination. Filtered materials were cultured on PPLO agar medium (Difco) and incubated at 37°C for 48 hours. Number of fried egg type colonies appeared which were isolated and identified as Mycoplasma SP.

Experimental transmission;

Two 6 months old native lambs were used for pathogenicity test of mycoplasma which was isolated from affected lambs in Lorestan and Khorasan provinces. The animals were bright and healthy before inoculation, the inoculum consisted of harvested 24 hours mycoplasma cultures in PPLO broth. Each animal received 0.5 ml intransally and 1 ml subcutaneously, in this experiment. The inoculated animals were examined and the body temperature recorded daily for 16 consecutive days.Twenty-four hours post inoculation the body temperature elevated in both animals to 40.5–41°C which was progressive and standing the same levels for 7 days. After that it decreased gradually so that on 16th. post inoculation day it was 36°C. The general health condition of the inoculated animals changed along with body temperature, six days after inoculation the animals showed lameness, and arthritis. The elbow, knee and hock joints were swollen and gradually enlarged till the 9th. day. The animals were unable to stand

on their feet, they layed in recombant position while showing slight respiratory disturbances such as dyspnea and nasal discharges.

At necropsy slight yellowish discoloration developed in all over the body, the carcasses were in chachectic condition, Tracheo-bronchial mucosa was congested and frothy exsudate was noted in trachea. Lungs were congested moderately, with consolidation of apical lobes. The internal organs were hyperemic with some petechial and echimotic haemorrhages scattering through out. Yellowish opac fluids with fibrineous deposition were noted in joints. Mycoplasma was isolated from pericardial, pleural and Synovial fluids, bacterological examinations was negative.

Antibiotic Sensivity Test;

The 72 hours culture of PPLO broth was on PPLO agar and antibiotic disks were put on it, then incubated at 37°C for 48 hours, wide clear zones observed around Lincomycin and Spectinomycin disks. The results of three strains that had been isolated from different farms used for sensivity tests (6), were the same.

Specimens for Histopathological examinations;

Tissued from trachea, different parts of lung, mediastinal lymph nodes, pericardium and pleura were collected in 10% formol saline, fixed tissues were processed by paraffine embedding method. The embedded tissues were cut 5 microns in thickness, the prepared sections were stained with Harris' Haematoxylin and Eosin, Gimsa's and Gram's methods.

Experimental animals;

12 sheep from each flock were selected for studying the efficacy of injectable Lincocin and Linco-Spectin, the affected sheep were divided in 2 groups for treatment.

RESULT;

Clinical features of the outbreak;

The appearance and clinical aspects of all nine reported flocks were essentially the same, the animals had been transported from different parts of Iran to Khorram Abad (the main city of Lorestan state) by lorries, where they were vaccinated against Anthrax, Enterotoxemia, Pox and Foot and Mouth Disease and later divided to several groups and shipped to feedlots. The first clinical signs were observed 2-4 days after delivering of animals and the disease spread rapidly to other-individuals so fast that up to 10% of the transfered sheep were

found to be affected within a couple of weeks. Elevation of body temperature to 40–41.5°C, depression, nasal and lachrimal discharges (Fig. 4), couphing, rapid breathing accompanied by anorexia were observed in affected animals. The nasal discharge appeared as serous and after a few days converted to mucopurulent (Fig. 3), death began to occure 2–7 days after the onset of the first clinical signs. The morbidity rates differed being up to 50% and mortality rate ranged from %5–12 of affected animals in different farms. Lameness and diarrhea were seen in affected animals at the time that the disease was spreading.

Post mortem examination;

Numbers of dead and sick animals were posted during out breaks, the striking gross lesions were confined to the respiratory tract, heart. Subcutaneous, submucosal and subserousa tissues presented petechial haemorrhages. Tracheobronchial pathways contained whitish frothy exsudate (Fig. 5). The mucous membrane of trachea, larynx and nasal cavity were moderately to severely hyperemic with petechial haemorrhage scattered through-out, lungs showed different stages of pneumonia and pleuritis depending on the progress ot disease, the changes were almost the same in dead animals. Consolidation ot apical, cardiac and anteroventral portions of diaphragmatic lobes existed, thick fibrinous substances had covered the consolidated areas of lung and adjacent pleura (Fig.6–7), resulting to adherence of visceral and costal pleura. Dark yelowish grey fluid could be collected from pleural cavity, the pneumonia mostly appeared bilateraly but some unilateral cases were also observed.

Pericardium was involved in advance cases, pericardial sac was thickened approximately 10 times of normal size with deposition of fibrinous exsudate (Fig. 8), submucosal petechial haemorrhages were evident in abomasum and intestines.

Histopathologically, the appearance of the affected lobules varried in the lung, Vesseles were severely engorged and serofibrinous exsudate existed in the alveola and pleura as a thick layer. In some lobes, tissue necrosis and abscessation that initiated from the center of the lobules were evident. The alveolar walls thickened by infiltration of inflamatory cells and edema while alveoli were filled with foamy macrophages, oat-shaped macrophages forming whorles in some alveoli and streamers in the alveolar ducts and respiratory bronchioles. The small bronchioles were hyper-plastic and their lumen filled with inflamatory cells predominanted by neutrophiles, while their epithelial cells were intact. Numerous colonies of tiny bipolar bacteria accompanied by severe neutrophilic reactions were presented in the alveoli, while different bacilli was evident in the rest of the lung tissues. Heart lesions indicating of fibrinous pericarditis.

Treatment;

For studying the efficacy of injectable Lincocins & Linco-Spectin on sheep pneumonia, 12 sheep with moderate clinical signs were selected from each flock and divided in 2 groups, the animals of one group were injected Lincocin (intramuscular) at recommended dosage of 10 mg/kg body weight or 1 ml/10kg as one injection per day for three consecutive days.

The second group were injected Linco-spectin (intramuscular) at recommended dosage of 1 ml/10kg body weight per day for three cosecutive days.

After first inoculation of both Lincocin &-Linco-spectin, the clinical signs became milder, body temperature, couphing, nasal discharges and rapid breathing regressed to the normal level. Stool that was watery in some experimental cases was found to be normal after three inoculation, the treated animals began to show normal appetite and start to ruminate and completely recovered within 2 weeks, while the mortalities continued in untreated animals.

Discussion;

The respiratory disease in sheep and goat causes high mortality and great economical losses in Iran every year. As mentioned, various chemotherapeutic substances and Vaccine preparations have been used to treat the disease. Both Lincocins & Linco-spectin used in this trial were effective on respiratory diseases of sheep (Pleuropneumonia) and consequently were active against mycoplasma, E. Coli and corynebacteria which were isolated from sick animals, the treated animals recovered rapidly and the results were fairly good.

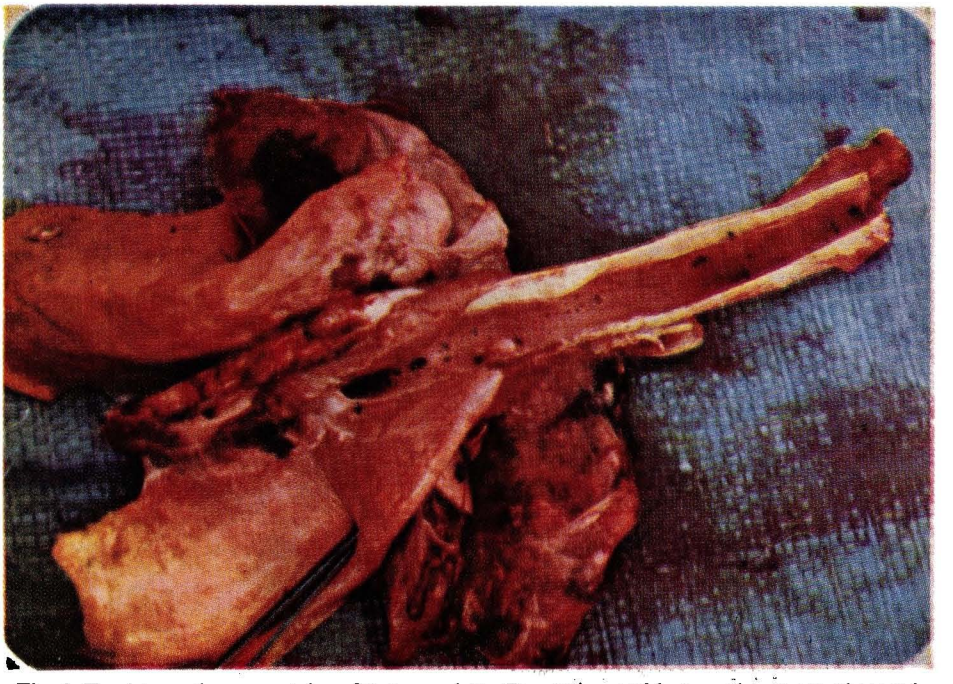

Fig. 1, Trachea pathway contain a fronty exudate, Congestion and haemorrhages are observed.

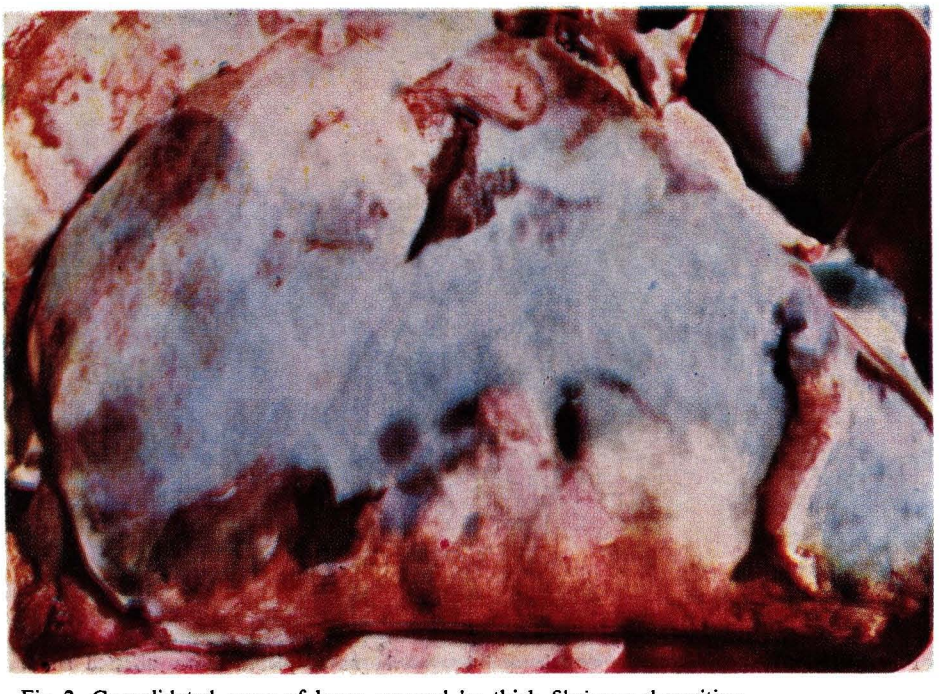

Fig. 2, Consolidated areas of lungs covered by thick fibrinous deposition.

Fig. 3, Mucoid nasal discharge contaminated with dust.

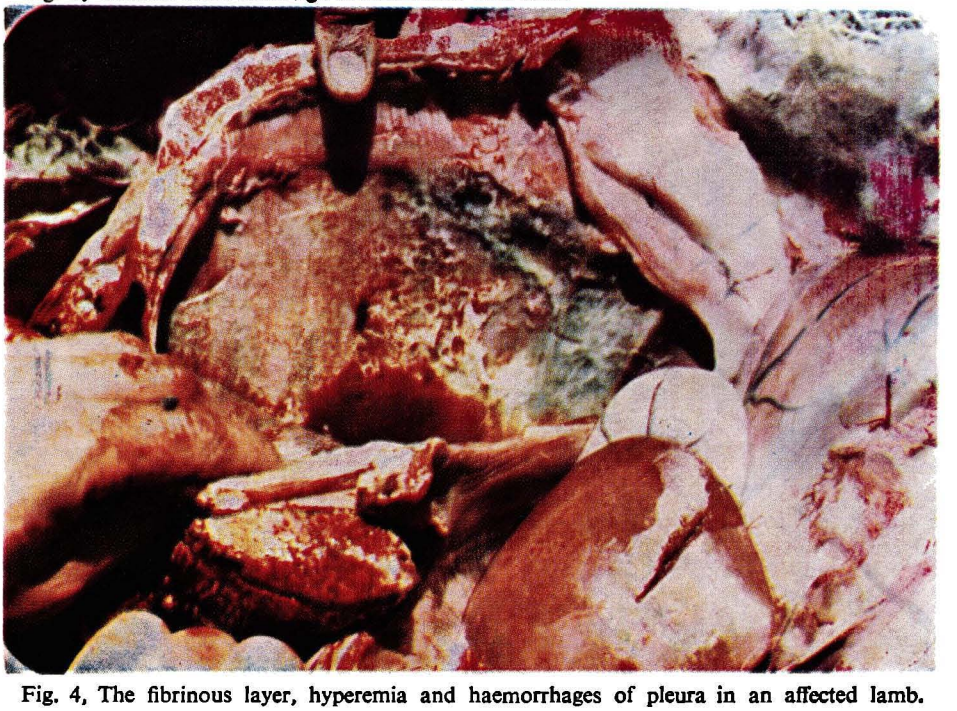

Fig. 4, The fibrinous layer, hyperemia and haemorrhages of pleura in an affected lamb. Note, The dark dirty yellow grey fluid.

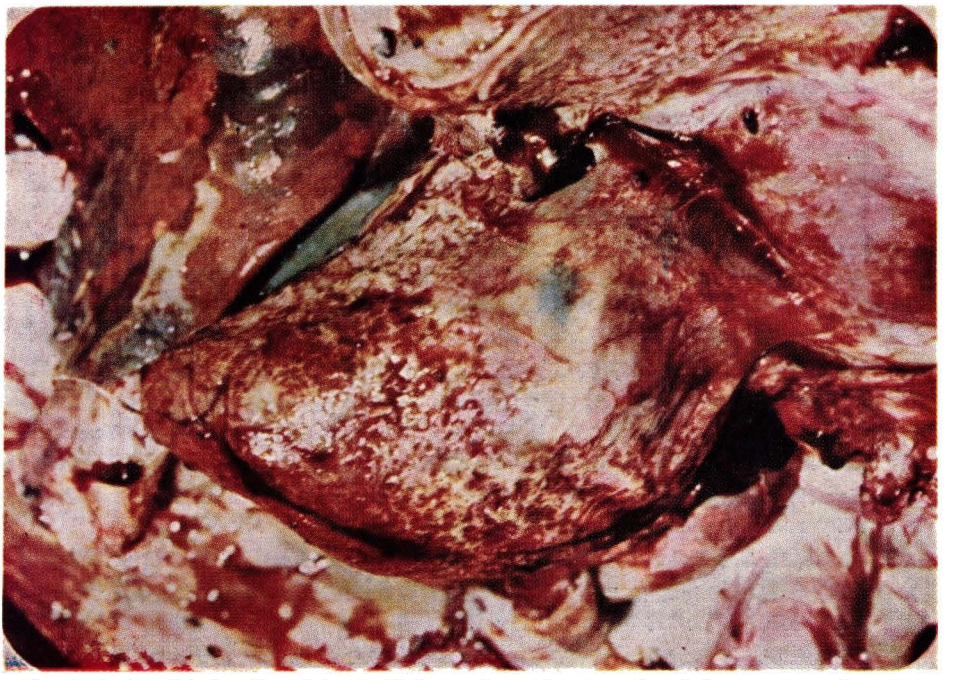

Fig. 5, Pericarditis in affected lamb, fibrinous deposition in pericardial sac and rough surface of the heart are clear.

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