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## SOME RESEARCH NOTES ON THE DIAGNOSIS, TREATMENT AND PROGNOSIS OF PASTEURELLA MULTOCIDA INFECTION OF SHEEP IN ASSIUT GOVERNORATE

(With 2 Table)

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### بعض الملاحظات البحثية على تشخيص وعلاج وفترة النقاهة لمرضى الباستيرلا في الأغنام بمحافظة أسيوط

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أجريت هذه الدراسة على مجموعة من الأغنام المصابة بميكروب الباستيرلا وذلك بمزرعة جحدم بمحافظة أسيوط بجمهورية مصر العربية. هذا وقد ظهر المرض فى ثلاثة أشكال الحاد وتحت المزمّن والمزمن. وقد لوحظ أن هذا المرض فى الحالات الحادة يتميز بأعراض التسمم الدموى أما الحالات تحت الحادة والمزمنة فتتميز بأعراض الالتهاب الرئوى التكرزى. هذا وقد ثبت أن العلاج بعقار الجنتاميسين كان ذو نتائج ايجابية فى الحالات التى كانت تعاني من الاعراض التنفسية بينما لم يعطى أى نتائج ايجابية فى الحالات التى كانت تعاني من الاستسقاء الموجوده بالأجزاء السفلى من جسم الحيوان. كما أثبتت الدراسة وجود زياده معنويه فى مستوى الجلوبيولين وايضاً نقص معنوى فى مستوى الالبومين ونسبة الالبومين الى الجلوبيولين. وهذه المتغيرات تعطى مؤشراً واضحاً على زيادة الاجسام المناعية فى دم الحيوانات بعد العلاج من المرض.

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### SUMMARY

This study was carried on sheep with clinical signs suggesting pasteurella infection. The sheep belonged to Gahdam farm, Assiut Governorate, Egypt. The disease was manifested in 3 forms acute, subacute and chronic. The acute form of the disease was characterized by septicemia while in the subacute and chronic form the disease showed signs of croupus necrotic pneumonia. Gentamycin treatment was effective in cases suffered from respiratory maifestation, while those suffered from pectoral oedema did not respond to treatment, increased level of globulins associated with decreased level of albumin and albumin globulins ratio in the serum of treated recovered sheep suggested the presence of incnreased antibody production.

### INTRODUCTION

Sheep are subjected to many diseased conditions among which pasteurellosis stands as an outstanding example. However, the available literature referring to pasteurellosis in sheep is not extensive so a brief survey without much details should suffice. In the past forty years there have been a number of reports of the disease condition in sheep associated with the organism of the genus pasteurella (MARSH, 1953). In the past pasteurellosis has been noted in the form of shipping fever of sheep (NEWSOM & CROS, 1923; DETWILLER, 1931 and MILLER, 1940).

GREECH and GOCHENOUR (1936) isolated pasteurella from the lungs of sheep affected with chronic progressive pneumonia. MOUTGOMERIE *et al* (1938) in England. made a bacteriological investigation of several outbreaks of pneumonia in sheep of which Pasteurella was isolated from 18 of 22 studied lungs.

CURASSON and DIDIER (1932) recorded a severe outbreak of ovine pasteurellosis with mortality rate of 60%. LEVSHON (1932) isolated a pasteurella strain from lungs, pleuretic fluid, heart blood and broncheal lymph nodes of sheep which had died in an outbreak of ovine pasteurellosis.

MARSH (1953) stated that pasteurella multocida is a frequent cause of pneumonic lesions in sheep either as a primary or as secondary invader. DOLDER and LEUENBERGER (1984) described an outbreak of pasteurellosis and recovered pasteurella from lung, liver and spleen. They made diagnosis of septicemia, but they stated that the disease did not correspond to the classical hemorrhagic septicemia.



In reviewing recent literature, one is impressed with lack of concrete information, especially as factors concerned with etiology, treatment and prognosis of the disease in sheep. This work was designed to study these factors.

### MATERIAL and METHODS

100 naturally infected sheep were used for this studies (Gahdam farm, Assiut Governorate) clinical signs of the diseased cases were recorded.

20 nasal mucous swabs and 10 samples of aspirated fluid exudat from abdominal, chest and legs swelling were collected under aseptic condition from clinically diseased sheep 40 samples of heart blood, epicardial fluids, tracheal frothy discharges and subcutaneous exudates were collected aseptically from 10 freshly dead sheep. All these collected samples were used for bacteriological studies. Mucous swabs were streaked on serum dextrose agar plates, while fluid samples were inoculated into the media. All cultures were incubated at 37°C for 1-3 days. Subculturing of the suspected colonies were done on a separate plates Biochemical tests of the isolated pasteurella organism were done according to *MODSEN et al.* (1985). Intraperitoneal inoculation of 8 white mice (5-weeks-old) with broth culture of each isolated strain of pasteurella multocida was done according to *RIMLER and RHOADS* (1987). Indirect hemagglutination test and known specific antisera were used for serotyping the isolated strains of pasteurella multocida type A.B.C. and E according to *CARTER* (1972).

Blood sera samples were obtained after treatment from 10 cases. Sera were used for determination of total protein, albumin, globulin and albumin globulin ratio, using test kits supplied from Biomerieux (Bains and France) and after the methods of *WEICHELBAUM* (1946) and *DRUPI* (1974).

### RESULTS

#### 1- Clinical signs :

Clinical signs of affected sheep with pasteurella infection, were respiratory manifestations, as bilateral mucopurulent nasal discharges, painful cough and painful grunting, abdominal respiratory movement. Body temperature ranged from 39.5-40°C. In addition these were anorexia, severe depression, stiffness in gate and gradual loss of weight. Auscultation of the lung revealed the presence of moist rales. Furthermore, the conjunctiva was bluish in colour and some cases showed oedematous swelling of the posterior portion of the abdominal surface and in the brest between the two fore legs and lower parts of the two fore limbs. The spread rate of



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the disease in the flock is much slower and flock mortality rate was 10%.

## 2- Post mortum examination :

Post mortum examination of dead sheep revealed that the lesions were either of septicaemic or pneumonic pastereullosis. The former lesions consists of petechial and echymotic hemorrhages in the serous and mucus membranes particularly the epicardium, pericardium, pleura, nasal and ocular mucus membranes. Extensive pulmonary oedema along with oedema of the lower parts of the body, abdomen, brest and fore legs were also observed in sheep suffering from septicaemic form. In sheep suffering from pneumonic form the lesions were restructured to the lung and consists of croupus of fibrinonecrotic pneumonia.

## 3- Microbiological studies :

The isolated organism on blood serum agar had a rounded, mucoid, smooth and medium sized colonies grayish in colour and non hemolytic. Morphological studies revealed that the organism was non motile Gram negative coccobacilli. The isolated organism was non motile Gram negative coccobacilli. The isolated organism killed mice within 24 hours post intraperitoneal inoculation. Reisolated organism had the same cultural and morphological characteristic of the primary isolates. Bipolarity of the re-isolated organism could be demonstrated by Loffler's methylene blue stain.

Using the indirect hemagglutination test, the isolated strains of pasteurella multocida were serotyped using known specific antisera. The test revealed that all isolated strains of pasteurella multocida were belong to type A.

## - Antibiotic sensitivity test :

Antibiotic sensitivity test against the isolated pasteurella organis revealed that the organism were highly sensitive to ampicillin and gentamycin Table (1).

Table 1: Showing the results of sensitivity tests

Antibiotic discs		Results	Antibiotic discs		Results
Tetracycline	30 mg	++	Streptomycin	10 mg	+
Gentamycin	10 mg	+++	Erythromycin	15 mg	++
Chloramphenicol	30 mg	--	Kanamycin	30 mg	++
Ampicillin	10 mg	+++	Novobiocin	30 mg	--



### 5- Treatment :

Treatment had been done according to the results obtained from the antibiotic sensitivity test against the isolated strains of *Pasteurella multocida* organism. Gentamycin 80 mg had been administered intramuscularly for treatment of infected sheep at a dose of 1 mg/kg body weight every 12 hours for 5 successive days. Fluid therapy. Tonics and diuretics was also given as a supportive treatment. The infected sheep which were suffering from respiratory manifestation completely recovered, while those which were suffering from oedematous swelling in the ventral parts of the abdomen, chest and legs did not respond to the treatment and died during the course of the disease.

### 6- Serobiochemical studies :

Table 2: Mean values and standard error of estimated parameters in the blood serum of both treated and control sheep.

Data estimated	Units	Mean Value in treated sheep	Mean Value in control sheep
Total protein	gm%	77.39±4.53	77.00±1.20
Albumin	gm%	25.29±1.60*	37.00±0.60
Globulin	gm%	51.00±3.53**	38.00±1.36
Alb/Glob	ratio	0.52±0.04*	0.81±0.18

\* Significantly decrease

\*\* Significantly increase

Serobiochemical investigations revealed that the mean value of total serum protein of the treated animals were not significantly changes when compared with those of control sheep. While albumin and albumin globulin ratio were significantly increased in the treated sheep when compared with the control ones.

### DISCUSSION

In sheep an outbreak of *Pasteurella multocida* infections often commenced with sudden deaths in the absence of prominent clinical signs. Some sheep showed respiratory embarrassment. As the outbreak progress. Respiratory involvement becomes more evident signs including dyspnoea. Slight frothing at the mouth, cough and nasal discharges and the course in most cases is about 3 days. Clinical examination of the affected sheep revealed symptoms of acute septicaemia. In the subacute and chronic cases the disease was characterized by symptoms of croupus necrotic pneumonia. This picture was confirmed by post



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mortum examination of ten infected sheep died during the course of the disease. The finding could be also confirmed by *OPPERMANN* (1950) who stated that the acute form of the disease characterized by septicaemia, while in the subacute and chronic form pneumonia predominates. The disease was characterized in its early stages by respiratory manifestation in which dyspnea, abdominal respiration, moist rales and nasal discharges were prominent features (*JUBB and KENNEDY, 1985*). In advanced cases the disease characterized by oedematous swelling of the petrol regions. These symptoms were identical to those described by *BUHR and ZYMPT* (1965) and *MISRA et al.* (1970).

*Pasteurella multocida* type A strain was constantly isolated from all diseased sheep used in this study the organism was isolated from the heart blood, nasal swabs, frothy exudate from the lung and the oedema fluid of subcutaneous connective tissue. Our results was equalent to those reported by *MORAD et al.* (1980); *CALLAN et al.* (1980); *SHALINSKII & NIKILOROVA* (1959) and *CARTER & ANNAU* (1953), who stated that type A strains of *pasteurella multocida* were the most virulant for sheep.

*GILMOUR* (1980) stated that the treatment perescribed for pneumonic pasteurellosis of cattle was used with similar results in sheep. They add that not all strains of biotype A are sensitive to Ampicillin, but almonst all strains are sensitive to Oxyttracycline, which may be the drug of choice especially when long acting preparation are available. They added that medication of water supplies with Oxytetracycline for 7-10 days may be beneficial. In this study a good model for treatment of pasteurellosis of sheep was given based on sensitivity test for the isolated organism. Diseased sheep were successively trated with Gentamycin (intramuscularly), fluid therapy, tonics and diuretic were used to overcome oedema, but all cases showed oedema which did not respond for treatment and were died. In our openion this was probably due to toxemia indicated by petechial and echymatic haemorrhage observed in such cases at post mortem examination.

Serobiochemical investigation throw some light on the health condition of the treated recovered sheep. It could be also taken as a good indication of efficient system of treatment adopted in this study. This concept can be supported by the fact that all treated sheep had a nearly normal level of a mean value of total serum protein. Increased mean value of serum globulin indicate antibody production. Decreased mean value of albumin and albumin/globulin ratio might be due to increased mean value of globulin on the expanses of albumin.



From these studies it could be concluded that pneumonic and septicaemic pasteurellosis occurred in sheep in some farms in Assiut Governorate was due to *Pasteurella multocida* type A strains. Sheep suffering from respiratory manifestation was successively treated with Gentamycin. However sheep suffering from pectral oedema did not respond for treatment. Increased mean value of serum globulin and decreased mean value of albumin globulin ratio might indicate increased antibody production.

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