

RESPIRATORY DISEASES COMPLEX IN SHEEP, ETIOLOGY AND EFFICACY OF TREATMENT

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ABSTRACT

Pneumonic signs appeared among a flock of sheep 1200 heads under 18 month age. The signs involved mild pyrexia, respiratory distress, purulent nasal discharge, sub mandibular and pectoral oedema and diarrhea in advanced respiratory signs.

The postmortem examination revealed that, the lung tissue was congested firm and hepatized with frothy exudates comes out from trachea, the liver was enlarged and gall bladder was distended with bile.

Bacteriological examination of nasal swabs pleural fluid and lung tissue revealed that, the etiological agents of this condition is a mixed infection with different species of pasteurilla spp., mycoplasma spp., E. Coli, Staph. aureus, Aerobacter aerogenes, Klebsiella pneumoniae and Haemophilus somnus.

The clinical condition of sheep supported by postmortem lesions should arrow the suspicion of respiratory disease complex which is confirmed by the achieved results of bacteriological examination.

Results of antibiogram showed that, all isolates were highly sensitive to marbofloxacin, lincospectin, ceftifur sodium, florafenicol, amoxicillin followed by gentamycin, sulpham & trimethoprim and tetracycline.

Field practices showed that, tulathromycin, marbofloxacin morboxyl (Vetoquinel) and lincospectin (lincomycin & spectinomycin) and tylosine plus could eliminate the microorganisms encountered in respiratory diseases complex in sheep with cure rate 95.9, 94.8, 91.9 and 90.1 % respectively.

INTRODUCTION

Infectious diseases represents a major constraint to the development of improved livestock production. Respiratory disease complex is one of the major disease limiting sheep production in the

world, the disease is multi factorial in nature caused by interaction between viruses, bacteria, mycoplasma and environmental stress factors. The disease is characterized by pneumonic signs (Radostitis et al., 1994).

The most common causes of sheep pneumonia are mycoplasma (chronic interstitial), *Pasteurella multocida*, *Mannheimia* (*pasteurella*) *haemolytica* (Fibrinous) and *Staph. aureus* (purulent) were reported by **Gilmour (1992)**, **Mishra (1992)**, **Elyas (1993)** and **Sooror (1999)**.

This study was undertaken to investigate:-

- 1- The etiological agent of sheep pneumonia.
- 2- Efficacy of treatment with specific antibiotic and anti inflammatory.
- 3- The recommendation for control of this problem.

MATERIAL AND METHODS

Animals:

One thousand and two hundred sheep ageing from 6 months to 18 months of different sexes belonging to private farm at Alexandria desert road were examined clinically.

Nasal swabs were collected from sheep showing respiratory manifestation.

Dead cases were subjected to postmortem examination where tissue specimens were collected from lungs and pleural fluids.

Bacteriological examination:

- Nasal swabs were dipped into nutrient broth for bacteriological examination.
- The lung samples and pleural fluids were cultured directly on blood agar and McConkey agar media and incubated aerobically for 3 days at 37°C for further investigation. The pure colonies were identified biochemically according to **Konemann et al., (1992)**.

Another lung samples and pleural fluid were cultured in heart infusion broth and heart infusion agar, then streaked in *p. plo media* for isolation of mycoplasma species. The isolated mycoplasma colonies were identified according to **Cruick shank et al., (1982)**.

Antibiogram:

All isolated were tested in their susceptibility to chemo therapeutic agents, the disk diffusion technique was applied to detect the drug of choice against different isolated strains according to **Finogold and Martin (1982)**.

The suggested regimens used for treatment of sheep suffering from respiratory signs.

The present work comprised 688 sheep suffering from different degree of pneumonic signs. The animals were randomly classified into four groups, each group received one type of systemic antibiotic only.

Group 1: Tulathromycin (Draxxin) [Pfizer]. (100 mg/vial Tulathromycin) intramuscular in a dose of 1 ml/40 kg b.w.

Group 2: Lincomycin and spectinomycin (Lincospectin) produced by Pharmacia intramuscular injection in a dose of 1ml/10 Kg b.wt.

Group 3: Marbofloxacin (Marbocyl vetoquinol) intramuscular injection 1 ml/50Kg b. wt.

Group 4: Tylosin and sulpha (Tylosine plus) each ml contain 150 mg tylosine & 200 mg sulphadoxazole. Blo-media 1ml/10 Kg b. wt.

* All the fore mentioned drugs were administered for 3 successive days except the Draxxin are shot only.

* Animal affected with sever pneumonic

signs were received initial treatment regimen that included:

- 1- Anti-Inflammatory.
 - a- Flunixin meglumine (Flunadyne) 1ml Intramuscular by at dose rate 1.1mg/Kg b.wt. 1ml/145 Lb.
 - b- Dexamethazone and phenylbutazone (Dexaphenyle arthritis) Vetoquinol, 0.035gm dexamethazone and 18gm phenylbutazone/100ml. 1ml/25 Kg b.wt.
- 2- Anti-histaminic: phenhydramine (Antistamin) at dose rate of 1mg/Kg b.wt.

Clinical observation was directed toward the affected sheep with a daily examination and assessment the degree of improvement regarding respiratory, the gait and appetite.

Bacteriological examination were carried out often clinical recovery.

RESULTS

Clinical examination:

The infected sheep suffering from signs of respiratory manifestation, including bilateral mucopurulent nasal discharge painful cough and painful grunting abdominal respiratory movement, temperature ranged from 39.5-40°C. anorexia, sever depression stuffy gait and gradual loss of weight

Auscultation reveal moist rales, the conjunctiva was congested or bluish in color. Submandibular and pectoral oedema and may extended along the ventral surface of the abdomen in some cases intestinal involvement was noticed by watery diarrhea in advanced respiratory signs.

Postmortem examination:

The lungs was congested, oedematous firm and hepaticized in some areas. Cut section of the lung revealed frothy exudates comes out from trachea, bronchi and bronchioles.

The liver was enlarged and congested and gall bladder was distended with bile. The blood vessels of the heart were congested and cyanotic.

The isolation of the organisms was most apparent from lung specimens (79 out of 87) 90.79% and nasal discharge (439 out of 688) 63.8%, where as isolation from the pleural fluid was revealed only from (29 out of 87) 33.3% dead cases.

DISCUSSION

Sheep less than 18 months age showed insidious onset of the respiratory system which involved respiratory distress, animal were lethargic with mild pyrexia purulent nasal discharge, submandibular and pectoral oedema and diarrhea in advanced respiratory signs. The postmortem finding showed that, congestion of the lung and frothy exudates escape from trachea. The clinical signs and postmortem lesion showed arrow the suspicion of respiratory disease complex in sheep and confirmed by laboratory examination. These picture was equivalent to those described **Elyas (1993) and Radostitis et al (1994)**.

The present investigation revealed concurrently the mixed infection with different species of *Pasteurella*, *Mycoplasma*, *E. coli*, *Staph. aureus*, *A. Aerogenes*, *Klebsiella pneumoniae* and *Haemophilus somnus*, were the main causative agents leading to high morbidity rate (57.5%) and low mortality rate (7.3%) among sheep, table (1).

It was evident from table (2) that the isolation of the pathogenic microorganisms was most apparent from lung specimens (90.8%), nasal swabs (63.8%) followed by pleural fluid (33.3%) similar isolation results were declared by **Assan, (2002)**.

It is evident from results tabulated in table (3) that *Pasteurella multocida*, *Pasteurella haemolytica*, *E. coli*, *Aerobacter aerogenes*, *H. somonus* and *K. pneumoniae* were responsible for severe pneumonia in sheep.

Similar results were reported by **Bocklitz et al (1987)**, **Nayak and Bhowmik (1991)**, **Manakhly (1995)** and **Jones et al (1997)** as they found that respiratory troubles attributed to mixed infection with different bacterial isolates and their circulating toxins.

Also this observation was in accordance with that mentioned by **Folmer et al (1984)** who found that, *Pasteurella* spp occurred in either single or mixed infection in sheep.

Pasteurella organisms are considered as normal inhabitants of upper respiratory tract of apparently healthy sheep (**Kadymov et al., 1987**) which are capable of inducing severe respiratory infection with or without viral infection (**Devis et al., 1981**).

The above mentioned results indicated that, mixed infection of mycoplasma and bacteria had a real danger on health status of sheep. **Judd et al., (1993)** recorded that, the mycoplasma organisms is the causative agent of contagious caprine pleuropneumonia which is considered as one of the major direct limiting sheep production.

Also it was found *E. coli* played a major role in this problem, this result agreed with that mentioned by **Klipstein (1995)** who noticed that *E. coli* was associated with respiratory disorders.

Results of the in vitro sensitivity test revealed that, all isolates were highly sensitive

to marbofloxacin, lincospectin, cefixime sodium, florfenicol, amoxicillin followed by gentamycin, sulpha & trimethoprim and tetracycline. The high susceptibility of microorganisms to most antimicrobial agent may be in part due to recent uses of antibiotic and another part due to lack of ability of microorganism to produce antibiotic inactivating enzymes or due to physicochemical properties of the cell envelope.

Treatment of pneumonic sheep with Draxxin, marbocyl, lincospectin and tylosine plus, showed cure rate 95.9%, 94.8%, 91.9% & 90.1 respectively (table 5). This high cure rate may be due to intracellular activity of antibiotic and then ability to penetrate caseous materials.

Finally the occurrence of respiratory disease complex in sheep is an expected event since such problem is a concomitant of the wide spread infections and non infections agents.

We advise that, strict hygienic measures and efficient immunization programmes should be applied to protect sheep against this infection. One of the biggest constraints is obtaining adequate vaccination covering is the poor response of animal owners to vaccination campaigns for a number of reasons. The orientation towards the necessity to explore the possibility of using polyvalent vaccine to reduce the number of times that animal expose for vaccination.

Clinical examination of sheep must be done periodically and treatment of pneumonic sheep early as soon as possible.

Table (3): Percentage of pathogenic microorganisms isolated from living and dead sheep.

Types of isolates	Living sheep		Dead sheep			
	Nasal discharge (439)		Lungs (79)		Pleural fluid (29)	
	No.	%	No.	%	No.	%
<i>E. coli</i>	196	44.6	14	17.9	4	13.8
<i>Aerobacter aerogenes.</i>	99	22.6	15	18.33	2	6.8
<i>P. multocida</i>	45	10.3	17	21.5	12	41.3
<i>Staph. aureus</i>	36	8.2	4	5	1	3.4
<i>P. haemolytica</i>	27	6.1	6	7.6	6	20.6
<i>K. pneumonie</i>	18	4.1	5	6.3	1	3.4
<i>H. somnus</i>	18	4.1	6	7.6	--	---
<i>Mycoplasma spp.</i>	----	----	12	15.2	3	10.3

Table (5): Results of efficacy of treatment of pneumonic sheep.

Animal groups Each group combined 172 sheep	Type of drug used	No. of Curried sheep sheep	Cure rate %
Group 1	Draxxin	185	95.9
Group 2	Lincospectin	159	91.9
Group 3	Marbocyl	165	94.8
Group 4	Tylosin plus	155	90.1

Table (1): morbidity and mortality rate.

	Diseased sheep		Dead sheep		Apparent healthy	
	No.	%	No.	%	No.	%
Total No. of sheep						
1200	688	57.5	87	7.3	425	35.4

Table (2): Percentage of positive cases of bacteriological examination.

<i>positive cases of nasal discharge</i>		positive cases of dead animal			
		lungs		Pleural fluid	
No.	%	No.	%	No.	%
439/688	63.8	79/87	90.8	29/87	33.30

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الملخص العربي

المرض التنفسي المركب فى الأغنام، الأسباب وكفاءة العلاج

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علامات تنفسية قد ظهرت على نطيع من الأغنام (١٢٠٠ رأس) تحت عمر ثمانية عشر شهراً وقد شملت الأعراض إرتفاع طفيف فى درجة الحرارة، ضيق فى التنفس، مخاط من الأنف، إمستقاء تحت الفك وفى الصدر وإسهال فى الحالات التى تعاني من الأعراض التنفسية المتقدمة.

وقد أظهر الفحص التشريحي أن نسيج الرئة محتقن ويشبه الكبد مع خروج سوائل من القصبة الهوائية وأن الكبد متضخم والحوصلة المرارية متعددة بالعصارة المرارية.

وقد أظهر الفحص البكتريولوجى لمسحات من الأنف ونسيج الرئة والسائل البلورى أن سبب هذه الحالة هو خليط من الميكروبات المرضية وهى ميكروب الباستريلا، الميكوبلازما، الميكروب القولونى، الميكروب الذهبى العنقودى، الأيروباكترا إروجينا، الكليسيلا والهيموفيلس سورناس.

وقد اتضح من الأعراض والصفة التشريحية والفحص الميكروبيولوجى أن الحالة المرضية هى المرض التنفسي المزمن.

أظهرت نتائج اختبار الحساسية للميكروبات المعزولة أنها حساسة جداً للماريفلوكساسين، النيكوسيكين، السيفتى فيورصوديرم، الفلوفيكول والأموكسيسيلين ثم الجنتاميسين، السلفا والترايميثوبريم وانتراسيكلين.

وقد تم علاج الحيوانات باستخدام الدراكسين، الماريوسيل، النيكوسيكين والتيلوزين بلس وكلها كانت مفيدة وكانت نسبة الشفاء ٩٥.٩٪، ٩٤.٨٪، ٩٤.٩٪ و ٩٠.١٪ على التوالى.

وقد تضمن العلاج استخدام مضادات الإلتهاب (الكورتيزون والفينادين) ومضادات الهيستامين لما له من أثر مفيد فى علاج الأغنام التى تعاني من الأعراض التنفسية الشديدة.