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**OBSERVATION ON AN OUTBREAK OF RESPIRATORY
DISTRESS IN FEED LOT CALVES, EPIDEMIOLOGICAL
CLINICAL AND MICROBIOLOGICAL FINDINGS**
(With 6 Tables and 2 Figures)

By

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**دراسة وبائية واكلينيكيه وميكروبيه عن وباء للأمراض التنفسية
فى عجول التسمين**

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تم عمل دراسة لوباء ظهر فى ٥٨٤ عجل فريزيان تراوحت أعمارها من ٦ إلى ١٠ شهور بمزرعة ٦ أكتوبر - غرب النوبارية والتابعة لجهاز الأمن الغذائى بالقوات المسلحة فى الفترة من أكتوبر ١٩٩٦ وحتى إبريل ١٩٩٧ . وقد لوحظ على العجول إنتشار بعض الإضطرابات التنفسية التى مثلت إكلينيكيًا فى إرتفاع درجة الحرارة ، الكحة ، إفرازات أنفية ودمعية ، مع كبح الشهية وصعوبة فى التنفس مع الهزال الشديد الذى أدى إلى نفوق بعض الحيوانات هذا وقد بلغ معدل الإصابة ٦٩,٣٤ ٪ ومعدل النفوق ٤,١ ٪ . ومن فحص البكتيريولوجى للمسحات المزروعة من الحيوانات المريضة تم عزل الميكروبات الآتية الباستريلا مالتوسيدا، الباستريلا هيموليتيكا، الهيموفيلس سيمنس، وكورين باكتريم بيوجينس ، السالمونيلا والإشيريشياكولاي . أما إختبارات الحساسية للمضادات الحيوية فقد أثبت أن كل الميكروبات موجبه الجرام كانت حساسه للبنسلين، الأنثروفلوكاسين، الأمبسلين ، الفليماكوين والتري ميثوبريم سلفا ميثواسازول أما البكتريا سالبة الجرام كانت حساسه لكل من الإنثروفلوكساسين، كلورامفينيكول، الجينتاميسين والأوكسى تتراسيكلين، والأرثرومايسين والأستربتومايسن، التراى ميثوبريم سلفا ميثواكسازول . ومن فحص الدم والعزل البكتيريولوجى وجد أن السبب الرئيسى لهذا الوباء هو ميكروب الباستريلا والهيموفولس . كذلك قد تم دراسة العوامل المسببه لهذا الوباء وكيفية الوقاية منها . وقد بدأ التحسن الملحوظ بعد علاج هذه الحيوانات بإستخدام الإنثروفلوكساسين مع مضادات الإلتهابات والحساسية وموسعات الشعب .

SUMMARY

An outbreak of respiratory disease with deaths was reported among feedlot calves at 6 October Military farm Nobarria, Egypt. The outbreaks involved 584 calves aged from 6 - 10 months. The diseased condition started during winter of 1996 till April 1997. The clinical signs consisted mainly of dullness, elevated rectal temperature associated with respiratory manifestations. Morbidity rate was high (69.34%), but mortality rate was low (4.1%). Bacteriological examination revealed isolation of *Pasteurella haemolytica*, *Pasteurella multocida*, *Haemophilus somnus*, *Corynebacterium pyogenes*, *Salmonellae* species and *E.coli*. Antibiotic sensitivity test revealed that all gram positive isolates were sensitive to Penicillin, Enrofloxacin, Ampicillin, Flumequine, Trimethoprim-sulphamethoxazole. On the other hand Gram negative isolates were sensitive to Enrofloxacin, Chloramphenicol, Gentamycin, Oxytetracycline, Erythromycin, Cephalomycin and Trimethoprim- sulphamethoxazole. Stained blood smear examination from severely affected calves revealed bipolar organisms in some cases. Trials for isolation of virus, mycoplasma, fungus revealed negative results. Good clinical responses was achieved with the use of Cidtryl (1 ml/ 40 kg B.W), antiinflammatory, antihistaminic, bronchodilator and fluid therapy .

Key words: Calves - Respiratory distress - Clinical findings

INTRODUCTION

Respiratory diseases continue to be severe economic constraint upon cattle production (Anon, 1985). Respiratory affections, particularly pneumonia is considered as one of the most important syndromes in calves both as an acute killing disease and more chronic form where losses are less apparent . Respiratory disease are the most causes of mortality in feedlot calves (Jensen et al., 1976) .

Despite numerous studies the microbiological etiology of the disease remain unclear (Yates, 1982). Andrews (1983) reviewed several syndromes which have been described in the United Kingdom including enzootic pneumonia in dairy breed calves and acute pneumonia in suckled housed calves .Many organisms have been implicated including *Pasteurella haemolytica* type A1, *P.multocida*, *Haemophilus somnus*, *Corynebacterium*

pyogenes, *Mycoplasma bovis*, *M. dispar* and the viruses BHV1, Respiratory Syncytial Virus (BRSV) Parainfluenza type 3 (PI3) and Bovine Adenovirus.

The aim of the present work was to identify which microorganisms or other factors are responsible for that outbreak and to study in vitro sensitivity of the isolated strains to certain antimicrobial agents so as to use the obtained results to formulate the most efficient control measures. The pathogenicity of some isolated bacterial strains for white mice was also carried out .

MATERIAL and METHODS

1) Clinical studies:

The clinical studies were performed during 1996/1997 calving period on 6 October military farm, Noharia, Egypt. The calves were previously vaccinated by cattle master⁽¹⁾ two month ago. (IBR , BVP , PI3, RSV.) .

2) Epidemiological examination:

The risk factors associated with the management and healthy status of the calves were studied .

3) Clinical examination:

A clinical history was taken for each sick calf and its clinical signs were carefully recorded. Nasal and fecal swabs were collected from diseased calves and inoculated onto nutrient broth, selinte F broth for 24 hours, then each sample streaked onto nutrient agar, blood agar, and Mac Conkey agar plates, brain heart infusion agar with 10 % bovine blood and 5% yeast extract under 5 - 10% Co2 tension, then incubated at 37 °C for 24-72 hours. The isolation, purification and identification of the bacterial isolates was carried out according to (Gossling, 1966) Cruickshank *et al.* (1978) Koneman *et al.* (1983) .

The antibiotic sensitivity of the isolated microorganisms was conducted against various therapeutic agents invitro (Difco, 1975).

Chemotherapeutic trial was done by using cidtryl in the dose of 1ml / 40 kg B.W after sensitivity test, as well as bronchodialotrs (Etaphyline) in adose rate of 4 mg/70 kg B.W. and mucolutics (Bisolvon) in adose rate of 5 mg / 70 kg B.W. for 5 successive days. In some cases Dexametanol in a dose rate of 4-10 mL./ calf and Avil with fluid therapy .

⁽¹⁾ Pfizer - Egypt, 29 , Hamadan st , Giza , Egypt .

Laboratory animals:

A total of 125 mice about 25- 30 grams were used to investigate the pathogenicity of *Haemophilus somnus* isolates and *Pasteurella* species, five mice were used for each isolate.

RESULTS

Out of 584 calves 6-10 months old belonged to 6 October military farm subjected to outbreak of respiratory distress, 405 calves had clinical respiratory manifestations with morbidity rate of (69.34 %) and mortality rate (4.1 %). Of the diseased calves 24 died or emergency slaughtered.

Clinical findings:

The respiratory signs consisted mainly of dullness, elevated rectal temperature, anorexia, dyspnoea, coughing, sneezing. Most of calves had serious nasal discharge during the first week of the outbreak. On the following week all calves were dull and easily restrained and about 60% were tachypnoeic at rest (respiratory rate 60 - 90/ minute). Several calves had mucopurulent nasal discharge, whilst others had dried exudate around their nostrils and eyes (Fig.1 & 2).

Some calves were seen to be diarrhoeic or had soiling of the tail and hind quarters. All calves were subjected to treatment from the onset of the disease according to the sensitivity tests which were carried out .

Postmortem findings:

Post mortem findings of dead calves showed either mucoid, mucopurulent or purulent discharges in the upper respiratory tract and crusts on the nostrils. In some cases multiple abscesses of variable sizes were seen in the lungs . Petchi and edema restricted to the thoracic region . Diffuse hemorrhage involved the tracheal mucous membrane. The lungs were congested , with variable degree of pneumonia. A bloody tinged fluid was seen in the thoracic cavity. Thoracic and mesenteric L.N. were swollen and congested. Variable degree of congestion were seen along the gastrointestinal tract. The spleen was enlarged and congested .

Bacteriological finding

Bacteriological examination of nasal swabs revealed that the isolated bacterial pathogens were *P. multocida*, *P. haemolytica*, *H. somnus*, *Corynebacterium pyogenes* , *Salmonellae* spp., *E. coli* and *Staph aureus*. On the other hand fecal swabs revealed *Salmonellae* spp .and *E.coli* .

Treatment

The choice of antimicrobials for diseased calves was made on the basis of bacterial susceptibilities of the organisms isolated from diseased calves Table (6). According to sensitivity test results, affected calves received enrofloxacin 10 % (Cidotryl-Cid company) at the dose rate of 1/ ml / 40 Kg B.W every twelve hours for three successive days. Etaphyline at the dose rate of 5 mg/70 kg B.W for 5 successive, Bisolvon at the dose rate of 4 mg/70 kg B.W for 5 successive, Dexatemanol, Avil and fluid therapy were used in some complicated cases. This combination has been effective in treating acute pneumonia in calves. After treatment the calves were bright and appeared to be healthy. The major signs had changed, oculonasal discharge disappeared, rectal temperature returned to normal, appetite was improved. Thirty nine calves remains dull and had a mucopurulent nasal discharge, these 39 were housed in a separate building and received further treatment.

DISCUSSION

The observed outbreak started during winter of 1996 that affects 584 calves, 6-10 months old which located at 6 October military farm, Nobaria, Egypt. The clinical signs observed in this outbreaks were dullness, elevated rectal temperature, anorexia, dyspnoea coughing, sneezing. Most of calves had serious nasal discharge during the first week of the outbreak. On the following week all the calves were dull and easily restrained and about 60% were tachypnoeic at rest (respiratory rate 60 - 90/ minute). Several calves had mucopurulent nasal discharge, whilst others had dried exudate around their nostrils and eyes (Fig. 1). Some calves were seen to be diarrhoeic or had soiling of the tail and hind quarters. These findings are nearly the same recorded by Al - Allawy *et al.* (1979), El- Sebaie *et al.* (1987) Yousef *et al.* (1992), El-Sheikh *et al.* (1994), Abou-Zaid (1996) and Naser & El-Sayed (1997).

In this outbreak the morbidity rate was 69.34 % while the mortality rate was 4.1 % these finding are nearly similar to Abdel-Ghani (1991) and Healy *et al.* (1993).

Our findings revealed that respiratory disease was the most frequent cause of morbidity and mortality in consistent with large feedlots. Jensen *et al.* (1976) and Edwards (1986).

Several factors may predispose to respiratory disease. These include starting diets, origin of calves and the stress of transport, handling and

management (Martin *et al.*, 1982, Wilson *et al.*, 1985). The important factors likely to have influenced the occurrence of these outbreaks included the several different farms from which calves were collected, transportation, the further mixing of animals to ensure pens of calves of similar age & weight. Another factors which may have contributed to the previous mentioned case is overcrowding, bad hygiene and environmental contamination.

Bacteriological examination of the culture swabs from diseased animals revealed that the isolated bacterial pathogens were *P. multocida*, *P. haemolytica*, *H. somnus*, *Corynebacterium pyogenes*, *Salmonellae* spp, *E. coli* and *Staph aureus*. Nearly similar pathogens were isolated by Abdel Ghani *et al.* (1991), Vestweber *et al.* (1990), El- Sayed *et al.* (1992) and El-Haenaey *et al.* (1994) and Walker (1996).

It is clear from the finding presented in table (3) that out of 350 positive cases from which pathogenic bacteria were isolated, 51.66 % revealed single infection, while the remaining cases 16.25 % were due to mixed infection. Nearly similar observation had been reported by Elyas (1982) and Ismail *et al.* (1993).

The pathogenicity of isolates of *H. somnus* and *Pasteurella* species to white mice revealed that all isolates were highly pathogenic to mice after intraperitoneal injection with 7.5×10^6 viable organisms, producing acute septicemia and death within 3-5 days post inoculation. This agrees with the result obtained by Kennedy *et al.* (1960), Foster and Scheer (1976) and Ismail *et al.* (1993). Stained blood film from blood of injected mice with *Pasteurella* species showed bipolar organisms.

The results achieved revealed the prevalence of *P. haemolytica*, *P. multocida* and *H. somnus* in this outbreak whereas the frequency of isolations from diseased and dead cases were 81, 47, 50 isolate respectively as single cause of the disease.

Concerning the antibiogram determination (Table 6) all gram positive isolates were sensitive to Penicillin, Enrofloxacin, Ampicillin, Flumequine, Trimethoprim - sulphamethoxazole and Erythromycin. On the other hand Gram negative isolates were sensitive to Enrofloxacin, Chloramphenicol, Gentamycin, Oxytetracyclin Erythromycin, Streptomycin and Trimethoprim-sulphamethoxazole. These findings in general partially coincide with Moustafa *et al.* (1990), Yousf *et al.* (1992). Variable results were reported by many authors Abdel Ghani *et al.* (1991), Ammer (1992) El-Haenaey *et al.* (1994) and Naser and El Sayed (1997).

Clinical improvement characterized by, increased appetite, increased activity, normal body temperature and decreased intensity of low-pitched crackles was detected through out the duration of treatment.

Avoidance of further mixing of calves on arrival to the unit, vaccination, adequate food, water and ventilation, increased observation of calves during the high risk period and earlier treatment of clinical cases may help to decrease the losses due to respiratory disease.

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Table :1 :- Calves surveyed in an outbreak of respiratory distress in 6 October military farm

Samples	total No.of samples	Condition of animals		
		App. healthy	Diseased	Died or emergency slaughtered
Nasopharyngeal swabs .	560	80	480	
Trachea& lung tissue	24	-	-	24
Total .	584	80	480	24

Tabl 2 :- The incidence of infection in calves with respiratory distress

at 6 October military farm

Types of samples	Condition								
	App. healthy			Diseased			Dead or slaughtered		
	total No.Ex.	No.of +ve	%	total No.Ex.	No.of +ve	%	total No.Ex.	No.of +ve	%
Nasopharygeal swabs	80	9	11.25	480	326	67.9			
Teachea & lung tissue	-	-	-	-	-	-	584	24	4.1

Table 3 :- The incidence of single and mixed infection cases from apparently healthy , diseased and dead or slaughtered calves .

Types of samples	App. healthy			Diseased			Dead or slaughter	
	total No.Ex.	No.of +ve	%	total No.Ex.	No.of +ve	%	No.of +ve	%
Single infection	80	5	6.25	480	248	51.66	18	4.44
Mixed infection	80	4	5	480	78	16.25	6	1.48
Total No.Ex.	80	9	11.25	480	326	67.91	24	5.9

Table 4 :- Prevalence of single infection in apparently healthy , diseased and dead or slaughtered calves

Condition of animal	micros isolated		No of +ve case	%	Pasteurella haemolytica	Pasteurella Multocida	Haemophilus somnus	staphylococcus aureus	Salmella	E.Coli
	Total No. of examind animal									
App.healthy	80	5	6.25		1	2	-	-	1	1
Diseased	480	248	51.6		68	44	48	34	42	12
Died or slaughter	24	18	75		13	3	2	-	-	-

Table 5 :- The prevalence of mixed infection with bacterial isolates from apparently healthy and diseased calves in 6 October military farm

Bacterial species	condition of calves					
	App. healthy		Diseased		Dead or slaughtered	
	+ Ve No.	%	+ Ve No.	%	+ Ve No.	%
Staph. aureus + E.coli	1	1.25	9	1.87	-	-
Coryn . Pyog + Past .	-	-	10	2.83		
Salm. + Past.			28	6.91	2	0.49
E.coli + Salm	1	1.25	17	4.19	1	0.24
Haemoph + Staph.	2	2.50	14	3.45	3	0.74
Total No.	4	5	78	19.25	6	1.48

Table 6 :- Sensitivity test results for the isolates recovered

from infected animals .

Antibiotic	Type of bacteria	
	Gram +ve	Gram -ve
Chloramphenicol	.	+++
Enrofloxacin	++	+++
Flumoxine	++	.
Ampicillin	++	.
Erythromycin	++	+
Gentamycin	.	++
Oxytetracycline	+	+
Penicillin	+++	.
Streptomycin	.	+
Trimethoprim sulphamethazole	++	+

- Resistant + Mild sensitivity . ++ Moderate sensitivity . +++ Highly sensitive

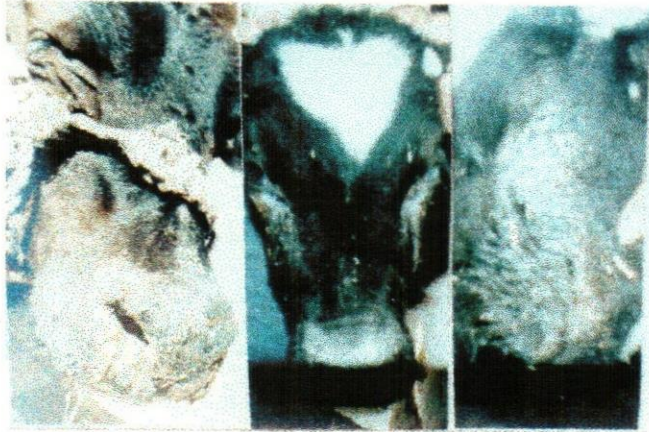


Figure (1) Oculonasal discharge and dried exudate around nostrils and eyes



Figure (2) Dyspnoea, nasal discharge and diarrhea

