

SOME STUDIES ON CLINICAL,HAEMATOLOGICAL AND BIOCHEMICAL CHANGES IN PNEUMONIC LAMBS WITH TRIALS OF TREATMENT

Hussein,E.A.,Alam,T. and Masoud,E.A.
Animal Health Res.Institute.Zagazig,Branch

SUMMARY

A total of 29 lambs(1-1.5 years old) with an average body weight 30-40kg (5 clinically healthy and 24 Pneumonic lambs) were used in this investigation. The lambs were belonged to private farm at Sharkia Governorate. These work aimed to study some haematological and biochemical changes associated with bacterial pneumonia in lambs. Lambs were divided into three groups.The first group(5 lambs) was apparently healthy and served as a control group. The pneumonic lambs were divided into two equal groups 12 lambs in each one. The second group received two therapeutic doses of florfenicol (IM) with 48 hrs. in-between. The third group received therapeutic doses of gentamicin (IM) for 5 successive days. Blood samples were collected from each lamb by Jugular vien puncture before treatment and 5,10 and 20 days post treatment for haemato-logical and some biochemical parameters determination.

The main clinical signs in pneumonic lambs were fever,bilateral nasal discharges,moist cough,dyspnea,congested mucous membrane, lacrimation, abnormal respiratory sounds, inappetence,weakness and later on recumbency. Bacteriological examination of nasopharyngeal swabs from 24 pneumonic animals revealed that the isolated bacterial pathogens were *Pasteurella multocida* (29.17%), *E.coli* (16.67%),*Staph. aureus* (12.50%),*Strept. pyogenes* (12.50%), *Klebsiella pneumoniae* (8.34%) and mixed infection including *Pasteurella multocida* and *E.coli* (20.82%).

Antibiogram studies reveald that Florfenicol,gentamicin and enrofloxacin were the most effective antibacterials against most bacteria isolated from pneumonic lambs.

Haematological investigations revealed microcytic hypochromic anaemia represented by a significant decrease of total erythrocytic count, haemoglobin content and packed cell volum%, lymphocyte and platelets coupled with leucocytosis associated with neutrophilia, eosinophilia and monocytosis.

Biochemically, there were an elevation in liver enzymatic activities of transaminases (AST- ALT), Gamma glutamyl transferase (GGT), glucose, urea, creatinine and phosphorus and insignificant increase in alkaline phosphatase, lactic dehydrogenase (LDH) with significant decrease in total protein, albumin, globulin calcium, sodium and insignificant decrease in potassium but magnesium insignificantly increased in pneumonic lambs when compared to healthy one. These parameters returned to the normal levels 15 days post treatment with florfenicol or gentamicin.

It could be concluded that bacterial pneumonia induced some adverse effect on haematological and biochemical parameters which returned to the normal levels post treatment by florfenicol or gentamicin but florfenicol had better efficacy in treatment of pneumonia in lambs than gentamicin.

INTRODUCTION

Despite many years of intensive research efforts, infectious respiratory disease continues to be a major cause of economic loss and adverse effects on animal welfare. The syndrome arises from a number of factors including those involving the animal, e.g. humidity that lead to stress, and presence of infectious agents, e.g. bacteria, virus (**El-Seidy et al., 2003**). Respiratory infections represent one of the most diseases of sheep especially lambs which cause serious economic losses (**Hamdy 1959**). In several previous investigations *Pasteurella multocida* was incriminated as the causative agent responsible for respiratory disorders in sheep (**Morad et al., 1980 and Callan et al., 1991**). Although many efforts were done for controlling the disease through medication and vaccination, a continuous research for new drugs for controlling the disease is a necessity (**Gilmour and Angus 1993**). Respiratory affections particularly bacterial pneumonia is a major problem of calves, so it is considered as a major source of economic losses to all domestic animals (**Wilson et al., 1985 and Ibrahim et al., 1988**). The causes and forms of pneumonia are bacteria, viruses, fungi, parasite or mixed infection, while poor hygienic measures, climatic disorders and stress environmental pollution were the most predisposing factors to such infection (**Yousef et al. 1992 and Sharma and Woldeh, 1995**). The inflammatory lung diseases were generally accompanied by marked drop of erythrocytic counts and marked elevation of total leukocytic counts in pneumonic calves (**El-Hamamy et al. 1999 and El-Bealawy, 2003**). Furthermore, in advanced cases febrile disease usually associated with hyperpyrexia and metastatic infection of lungs, liver and kidneys which may lead to hepatic and renal dysfunctions (**Kaneko, 1997, Selim et al., 1997, Soroor, 1999 and Radostitis, et al., 2002**). Gentamicin is an aminoglycoside antibiotic isolated from *Micromonospora purpurea*. It is effective against both G+ve

and G-ve organisms (**Tobin, 1979**). The mechanism of action of gentamicin involves irreversible inhibition of bacterial ribosomes and therefore impairs protein synthesis, (**Bryan and Kwan 1983**). This aminoglycoside is widely used in veterinary and human medicine, because of its efficacy in treating drug resistant G+ve and G-ve bacterial infections (**Karlowsky et al.,1995**). Unfortunately, it has a narrow therapeutic index (**Swartz ,1997**), and high potential for nephrotoxicity and ototoxicity. **Choudhury and Ahmed (1997)** found that toxicity develop as a result of marked accumulation and retention of the aminoglycoside in the proximal tubular cells. Florfenicol is a synthetic antibiotic possessing a wide spectrum of activity against many Gram negative bacteria(**Syriopolou et al.,1981**). Although florfenicol is a structural analogue of thiamphenicol, it has a superior spectrum of activity and its more potent component (**Varma et al.,1986 and Marshall et al.,1996**). Florfenicol different from thiamphenicol in substitution of florin atom for a hydroxyl group that making it superior than thiamphenicol (**Verma et al.,1996**). The aim of this study was to evaluate the effect of bacterial pneumonia on the haematological and some biochemical values as well as to evaluate the efficacy of florfenicol and gentamicin in treatment of pneumonia in lambs

MATERIAL AND METHODS

Drugs:-

1st Gentamicin (garavet) Egypt.

2nd-Florfenicol(Nuflor) from (Schering-Plough Animal Health).

Animals :-

This study was carried out in a private farm at Blebis city(Sharkia–Governorate) during the period from september2005 to november2005. A total of 29 lambs(1-1.5 years old) with an avarage body weight 30-40kg, 5 clinically healthy and 24 pneumonic lambs were used in this investigation. Lambs were divided into three groups. The first group was clinically healthy and served as a control group. 24 lambs suffering from signs of respiratory troubles including bilateral nasal discharges , moist cough, dyspnea, fever, congested mucous membrane, lacrimation, abnormal respiratory sounds , inappetence , weakness and later on recumbency. Pneumonic lambs divided into two equal groups, 12 lambs in each. The second group pneumonic lambs treated with therapeutic dose (20 mg /kg b.wt.)of florfenicol two doses inbetween 2 days (I.M.) (**Madelnat,1982**) . Third group pneumonic lambs

treated with therapeutic dose of gentamicin(5 mg/kg.b.wt.)for 5 successive days(I.M).

Rectal temperature :

Rectal temperature was recorded daily for the diseased lambs up to 10 days post treatment with florfenicol or gentamicin

Bacteriological examination:-

Nasopharyngeal swabs were taken from apparently healthy and diseased lambs for bacteriological examination. The collected samples were inoculated into brain heart infusion broth and incubated at 37 °C for 24 hrs., then loopfuls were streaked onto blood agar, nutrient agar, mannitol salt agar and MacConkey's agar then incubated at 37°C for 24 hrs. The obtained growth was examined according to (**woldehiwet, et.al,1990**). The isolates were identified biochemically according to (**Holt et al.,1994**).

Antibiotic sensitivity

In vitro antibiotic sensitivity test of different isolated microorganism against antibacterial agents was carried out using disc diffusion method described by **Plair et.al. (1970)**. The antibiotic used were florfenicol (30ug), gentamicin (10ug), ceftiofur sodium (10ug), kanamycin (30ug), spectinomycin (10ug), erythromycin (15ug), enrofloxacin (10ug) and flumequine (30ug).

Blood samples.

Two blood samples were collected from each lamb by Jugular vein puncture before treatment and 5, 10 and 20 days post treatment. The first sample (5 ml) was collected from each lamb on EDTA tube for haematological studies. The second blood sample (10 ml) was collected in clean, dry centrifuge tube without anticoagulant, left at room temperature and then centrifuged at 3000 r.p.m. for 5 minutes. The separated sera were used for some biochemical parameters determination.

Haematological studies

Blood count (total erythrocytic count, packed cell volume percent, haemoglobin and total leukocytic count) were performed according to techniques described by (**Jain ,1986**).

Biochemical studies :

The obtained clear sera were used for measuring the activities of serum transaminases (AST-ALT) according to (**Reitman and Frankel 1957**),alkaline phosphatase (**John, 1982**), gamma glutamyl trasferase (GGT)(**Szasz,1969**) lactic dehydrogenase (LDH) (**Mequeen ,1972**) total protein,albumin and globulin (**Grant et al, 1987**) ,glucose (**Trinder,1969**),urea (**Fawcet and Scott 1960**),creatinine (**Husdan and Raporpot1968**) calcium(**Gindler and King ,1972**) inorganic phosphorus (**Goldenberg,1966**)magnesium (**Gind1er and Heath, 1971**) and sodium (**Henry et al.,1974**

Treatment trials:

Two groups of infected lambs with pneumonia were treated with either florfenicol (20 mg /Kg b.wt.)two doses inbetween 2days (I.M.)or gentamicin (5mg/kg.b.wt.) intramuscular route from the respective drug for 5 consecutive days.

Statistical analysis

The obtained data were tabulated and statistically analyzed according to (**Petrie and Watson ,1999**).

RESULTS

The main clinical signs were bilateral nasal discharges, moist cough, dyspnea, fever, congested mucous membrane,lacrimation,abnormal respiratory sounds,inappetence, weakness and later on recumbency.

1) Rectal temperature.

It is clear from Table (1) that the recorded rectal temperature in pneumonic lambs ranged between 41.32 to 41.40 °C.The rectal temperature of lambs treated with florfenicol returned to normal levels post three days of treatment, while the rectal temperature of lambs treated with gentamicin.returned to normal level after 3- 6 days post drug administration.

2)Bacteriological isolation : -

Bacteriological examination of 24 nasopharyngeal swabs originated from pneumonic lambs revealed that the isolated bacterial pathogens were *Pasteurella multocida* (7cases) 29.17%, *E. coli* (4cases) 16.67%, *Staph. aureus* (3cases) 12.50%, *Strept. pyogenes* (3cases) 12.50%, *Klebsiella pneumoniae* (2cases) 8.33% and mixed infections including *Pasteurella multocida* and *E.coli* (5cases)20.83% Table (2)

3)Antibacterial sensitivity tests: -

Table(3)revealed that the isolated strains were highly sensitive to florfenicol , gentamicin , enrofloxacin and moderately sensitive to kanamycin,ceftiofur sodium, spectinomycin, and the least sensitivity was showed against flumequine and erythromycin.

4)Haematological values :

The obtained data in Table (4) showed that a significant decrease in erythrocytic count, haemoglobin content, packed cell volume percent, lymphocyte and platelets coupled with leukocytosis, associated with neutrophilia, eosinophilia of lambs suffering from pneumonia. Haematological parameters were returned to the normal levels at 20 days post treatment.

. D)Biochemical studies :-

Tables (5,6 and 7) revealed that an elevation in liver enzymatic activities of aspartate aminotransferase (AST),alanine aminotransferase (ALT),Gamma glutamyl transferase(GGT) ,glucose ,urea , creatinine , phosphorus and insignificant increase in alkaline phosphatase, lactic dehydrogenase (LDH) with significant decrease in total protein, albumin , globulin calcium,sodium and insignificant decrease in potassium but magnesium insignificantly increased in pneumonic lambs in compared to healthy one. This parameters returned to the normal levels 15days following treatment

D) Anti-bacterial in vivo “Efficacy”

Improvement of clinical symptoms was observed following administration of either florfenicol or gentamicin. It was found that the treatment with florfenicol was better than treatment with gentamicin because the total cure rate of florfenicol was100% at 4 days post treatment while that of gentamicin was100% at 6 days post treatment Table (8).

DISCUSSION

Respiratory diseases are often considered as the most significant causes of economic losses in feedlot cattle. In addition, great economic losses occurred due to the deaths of animals from respiratory diseases, cost of treatment, weight loss, prolonged feeding periods and prevention programmes (**Leukeux, et.al., 1985**). The clinical signs of pneumonia in lambs in this study were congested mucous membranes, fever, bilateral nasal discharges, moist cough, abnormal respiratory sounds, dyspnea and recumbency. Some signs were observed previously by **Novert (2004)** and **Abdalla and Emam (2005)** in calves and lambs respectively. Rectal temperature of diseased lambs were 41.32 °C and 41.40 °C and returned nearly to the normal levels at 4 and 6 days post treatment with florfenicol or gentamicin respectively. Florfenicol was better than gentamicin in treatment of bacterial pneumonia in lambs. These results reinforced by the study carried by (**Hanafy and Eisa 2004**). Bacteriological examination of nasopharyngeal swabs originated from diseased lambs revealed that the isolated bacterial pathogens were *Pasteurella multocida*, *E. coli*, *Staph. aureus*, *Strept. pyogenes*, *Klebsiella pneumoniae* and mixed infection (*Pasteurella multocida*+*E. coli*) in percentages of 29.17%, 16.67%, 12.50%, 12.50%, 8.33% and 20.83% respectively. These findings were similar to that reported by **El-Rawy and Gorgi (2001)** and **Hanafy and Eisa (2004)** in sheep and cow-calves respectively. Disc diffusion test is widely used for antimicrobial sensitivity test for reasons of time, simplicity and cost (**Green Wood 1978**). In the present study by using the disc-diffusion test showed that the most effective drugs were florfenicol, gentamicin, enrofloxacin and the least effective were flumequine, erythromycin and spectinomycin. These results were in agreement with those obtained by **El-Sayed, et al., (1992)** who mentioned that gentamicin had high inhibitory effect on *E. coli*, *Strept. uberis* and *Klebsiella*. **Hanafy and Eisa (2004)** and **Abdalla and Emam (2005)** concluded that the florfenicol were highly active against *Pasteurella multocida* in cow-calves and lambs respectively. The present work revealed that pneumonic lambs suffered from microcytic hypochromic anaemia represented by significant reduction in erythrocytic counts, haemoglobin content, packed cell volume percent, leukocytosis associated with neutrophilia and eosinophilia. **El-Sayed, et.al. (1992)**, **Kodary and Abdalla (2001)** and **Abdalla and Emam (2005)** recorded that a significant decrease in the erythrocytic counts, haemoglobin content, packed cell volume percent, lymphocyte, platelets and,

increase in total leukocytic count and neutrophils in fattening buffaloe calves and lambs respectively. The changes in erythrogram may be attributed to the failure of bone marrow cells and hepatocytes for utilization and synthesis of haemoglobin resulting in inhibition of erythropoiesis during bacterial infection (**Kaneko, 1997**). The changes in leukogram observed in this study may be due to bacterial infections and inflammatory lesions in lung (**Coles 1986**). The haematological parameters in diseased lambs were improved towards the normal level at 20 days post treatment with florfenicol and gentamicin. The reversible increase of haematological parameters post treatment with both drugs were supported by **Hanafy and Eisa (2004)** who reported that treatment of pneumonic cow-calve with florfenicol induce improvement of erythrogram and leukogram 2 - 3 weeks post treatment. **Omran et.al. (2005)** found that the blood parameters of pneumonic calves were returned towards the values of the control group after 15 days post treatment with gentamicin.

The current study demonstrated that a significant increase in transaminases (AST and ALT) and GGT but serum alkaline phosphatase and lactic dehydrogenase (LDH) did not show any changes in lambs suffering from pneumonia. These results could be due to the degenerative and necrotic changes accompanied the damage of pulmonary tissue due to bacterial infection and its toxins (**keneko, 1989**). Our results agree with **Kodary and Abdalla (2001)**. **El-Sherbini ,et.al. 1996** reported that pneumonia did not induce any changes in alkaline phosphatase in pneumonic buffalo-calves. **Abdou ,et.al. (1989)**, **Mokhbatly and Selim (1999)**, and **Hanafy and Eissa (2004)** recorded that pneumonia induced insignificant change of lactic dehydrogenase (LHD). Serum GGT showed significant increase in the activity in lambs suffered from pneumonia. Same results were reported by **Gharib (1989)** and **Mokhbatly and Selim (1999)** in buffalo and cow-calves. This enzyme is widely distributed all over the body cells and tissues. Furthermore, its increase reflects an active pathological process without referring to the site of affection.

Diseased lambs showed a significant decrease in total proteins, albumin, globulin and non significant alteration in A/G ratio. The above mentioned results were supported by previous studies of **Kodary and Abdalla (2001)**. **El-Seidy, et.al. (2003)** in lamb and rabbits respectively.

The decrease in total protein, albumin and globulin was described by **Selim et al. (1997)** who recorded that the reduction in the proteinogram may be attributed to the state of anorexia and inability of the liver to synthesis proteins. Moreover, bacterial toxins increased the capillary permeability and permitted escape of plasma proteins into tissue resulting in hypoproteinemia (**Doxey 1971** and **Naser and El Saed 1997**). These results seem to agree with those reported by **Cornelius (1960)**. Who considered febrile diseases to be the most common reasons for hypoproteinemia and hypoalbuminmia. Proteinogram

returned to the normal level at 21days post treatment with florfenicol or gentamicin. Our finding was in agreement with those obtained by **Hanafy and Eissa (2004)**.

Concentrations of glucose level in the lambs suffering from pneumonia in our gained results were evident to show highly significant increase in comparison with apparently healthy lambs. These results coincided with those obtained by **Mokhbatly and Selim (1999)** and **Abdalla and Emam(2005)** in calves and lambs respectively. **Coles (1986)** attributed the cause of hyperglycemia to anoxia, liver glycogen is unstable in the presence of deficient oxygen supply in pneumonic calves.

Analysis of blood serum constituents of pneumonic lambs in this study revealed a significant increase in urea and creatinine. This increase in urea and creatinine may be attributed to increase protein catabolism and febrile respiratory diseases, impaired cardiac function and decrease renal blood flow which might occur in cases of pneumonia which tend to increase urea and creatinine levels (**Radostitis, et.al.1995**) . This finding fitted closely with those of **Mokhbatly and Selim(1999)** and **El-Seidy,et.al.(2003)** in calves and rabbits respectively. Serum electrolytes levels including calcium and sodium were significant decrease in pneumonic lambs. Decreased calcium was coupled with significant increase in phosphorous level in the pneumonic lambs. the decreased calcium level in serum may be due to the decrease of calcium reabsorption from damaged renal tubules (**Coles 1986**) and may be associated with hypoproteinemia(**Kaneko 1997**) Our results was in agreement with those obtained by **Osama et.al. (2000)**. Comparing the recovery rate from pneumonia by treating with florfenicol or gentamicin and with the previously mentioned doses revealed that the cure rate was 100% at 4 and 6 days post treatment respectively. These findings were similar to that reported by **Hanafy and Eissa(2004)**.

It could be concluded that florfenicol has a good efficacy in treatment of pneumonia in lambs than gentamicin.

REFERENCES

- Abdalla O.E.and Emam .E.E.(2005)**Evaluation of marbofloxacin and isoflupredone acetate as a therapy of pneumonia associated with *pasteurella multocida* in lambs.4th Scientific Confer.of Faculty of vet. Med. Mansoura university283-301
- Abdou,O.; Hussein, M.; Kamel, F.M. and Deghedy, N.S.(1989):** Studies of some enzymes changes in calves suffering from bronchopneumonia, enteritis and Omphalophelebitis.Alex.. Vet. Sci., 5(2) 721- 728.
- Bryan,L., and Kwan,S.(1983):** Roles of ribosomal binding, membrane potential and electron transport in bacterial uptake of streptomycin and gentamicin. Ant.Agents Chem,23 :835 - 845.
- Callan,R.;Gunch,T.;Workman,G.and Mock, R.(1991):** Development of pneumonia in desert bighorn sheep after exposure to a flock of exotic wild and domestic sheep. **J. Am.Vet. Ned. Assoc.198 (6): 1052-1055.**
- Choudhury D., and Ahmed Z. (1997):** Drug - induced nephrotoxicity. Med. Clin. North Am. 81 : 705 - 717.
- Coles, E.H. (1986):** Veterinary Clinical Pathology. 4th. Ed., W.B. Saunders Company Philadelphia, London, Teronto, Mexicocity, Sydney Tokyo, Hong Knog.
- Cornelius,C.(1960)**Serum proteins in veterinary clinical diagnosis.Western Vet.(7) 77.
- Doxey, D. (1971) :** Veterinary Clinical Pathology. 1st. Ed., Bailliere tindal, London.
- El-Bealawy, M. A. (2003):** Haematological and biochemical studies on pneumonia in new born calves. Egypt. J. A. Agric. Res. , 81(1): 2003.
- El-Hamamy,M.; El-Boushy,E.and Fetaih, A.(1999):** Some studies on newly born calves problems with relationship to their immune status. Suez Canal Vet. Med. J. II (2) : 289-308.
- El –Rawy, Eman,M. and Gorgi, Suzan, F. (2001):** Comparison of different typing systems used for identification of *pasteurella multocida* isolated from sheep. J. Egypt. Vet. Med. Assoc., 61(2): 209-217.
- El-Sayed,R.;Nafie,T.and El-Meligy,A.(1992) :**Some investigation on an outbreak of enzootic bronchopneumonia among fattening buffalo-calves .Assiut Vet . Med .J.,27 (53) 175-187
- El.Seidy, I.A.; Koratum, Kh. M. and Rafaat, M. (2003):** Therapeutic effect of florfenicol against respiratory infection in sheep. Egypt. J. Comp.and Clinic. Path. 16 (10) 30- 42.
- El-Sherbini, M.; Youssef, M., and Rizk, L.G.(1996) :** Respiratory affection in buffalo-calves :biochemical changes and treatment .7th .Sci.Cong.Fac.Vet.Med. Assiut Univ .547-558.

- Fawcett, J.K. and Scott, J. E. (1960)** Determination of urea. *J. Clin. Path.*, 13 : 156
- Gharib, H.E. (1989)**: studies of enzymatic changes in blood of newly born calves and their relation to age and some common diseases. M.V.Sc. Thesis, Fac. Vet. Med. Cairo Univ.
- Gilmour, N.T. and Angus, K.W. (1993)**: Pasteurellosis In: *Diseases of Sheep*; Blackwell Scientific Publications, Oxford., 3-8.
- Gindler, E. and Heath, D. (1971)**: Determination of serum magnesium *clin. Chem.* (17) 662.
- Gindler, E.M. and King, J.O. (1972)**: Rapid colorimetric determination of calcium in biological fluids with methyl-thymol blue. *Am. J. Clin. Path.* (4) 372-382.
- Goldenberg, H. (1966)** Determination of serum inorganic phosphorus *clin. Chem.* (12) 871.
- Grant, G.H.; Sliverman, L.M. and Christenson, R.H. (1987)**: "Amino acids and proteins." In: *Fundamental of clinical chemistry 3rd Ed.*, Pp. 291- 345, N.W. Titez Philadelphia W.B. Saunders Company.
- Green wood, D. (1978)**: Activity of flumquine against E.Coli in vitro comparison with nalidixic acid and oxalnic acid. *ant. Microb. agent and cremoth.* (13) 479-483.
- Hamdy, A.A.H. (1959)**: Observation on respiratory diseases agents in lambs. Dissertation Ohio 124. Cited from Nagy (1976).
- Hanafy, Shahira, M.H. and Eisa, A.M.A. (2004)**: A field trial for treatment of pneumonia caused by *Pasteurella* spp. in cow calves using new antibiotic florfenicol (Nuflor). *Pro. the 1st Conf. Vet. Div. NRCC Cairo Egypt.* 60-73.
- Henry, R.J; Harper, R. and Hagerstein, (1974)**: *Clinical Chemistry Principle and Techniques*, 2nd Ed.
- Holt, J.G.; krieg, N.R.; Smeadb.,; Staley, J.T. and Williams, S.T. (1994)**: *Bergey's Manual of Determinative Bacteriology*. 9th. Ed. Williams and Wilkins Co.; Baltimore
- Husdan, H. and Rapoport, A. (1968)**: Estimation of creatinine. *Clin. Chem.* (14) 222
- Ibrahim, I.A.; El-Ghannam, M.A.; Youssef, M.; El-Magawry, S. and Dowider, M. (1988)** : Some biochemical and bacteriological alterations associated with transported pneumonic Friesian calves. *Alex. J. Vet. Med., Sci.*, 4 (1): 523-532.
- Jain, N. (1986) *Schalms' Veterinary Haematology 4th Ed.*, Lea and Fibiger, Philadelphia, U.S.A.
- John, D.B. (1982)**: *Clinical Lab. Method for Determination of Alkaline Phosphates 9th . Ed.* 580-581

Kaneko,J.; John, H. and Michael, B. (1997): Clinical biochemistry of domestic animals. 5th Ed. Academic Press, San Digo. London. Tokyo and Toronto.

Karlowsky,J. Zelenitsk,Y. and Zhanel,G.(1995):Aminoglycoside adaptive resist-ance Pharmacotherapy 17 : 549 – 55.

Keneko,J.(1989): Clinical Biochemistry of Domestic Animal. Academic Press Inc., New York ,London

Kodary,R.and Abdalla,O.(2001)Evaluation of tilmicosin as a treatment for pneum-onia caused by pasteurilla mltoocida in ewes. Beni- Suef Vet.Med, J, 11 (28) 453-463.

Leukeux,P.;Vorhoeff, R.;Hazer,R. and Bieukink,M.J.(1985):"Respiratory syncytial virus pneumonia in Friesian calves physiological findings." Res.Vet. Sci.,39(3): 324.

Madelant,A.(1982):Allotment and dose calculation from Schering Plaugh Animal Health.clinical Research.Study no.1320C-20-V94-211.

Marshall.S.A.,Jones,R.N.and Wagner,A.(1996):Proposed MIC quality control guidelines for National Committtee for clinical laboratory studards susceptible tet using severe veterinary antimicrobial agent Ceftoifur Enrofloxacin Florfenicol, permafloxacin and Spectinomycin. J.Cln.Microbial.,34(8)2027-2029

Mequeen, M.J. (1972): Determination of serum lactate dehydrogenase. Clin. Chem. 18:275.

Mokhbatly,A.and Selim,G.A.(1999):Some hematological biochemical and bacteriological studies on pneumonic calves at Sharkia Province. Egypt. Comp. Path. & Clin. Path. Vol. 12 No. 2 (October)

Morad,M;El-Amrousi,S.; Barakat,A. and El.Allawy,T.(1980) Experimental studies of some strains of P. multocida from different animals.Assiut Vet. Med. J.,(7)342-350

Naser,M.and El-Sayed,R.(1997): Clinical biochemical and bacteriologic studies on pneumonic buffalo-calves with trials for treatment J. Egypt Vet. Med. Ass. (57)569.

Novert, M.H.(2004): Bacteriological and mycoplasmal studies on lung infections in newly born calves .J.Egypt.Vet.Med.Ass.62,4:189-194.

Omran,H.;Anwaar,M.and Kadry,M.(2005):Some haematological and biochemical alterations associating clinical pneumonia in friesian calves with trials of treatment.4th Scientific Confer.of Faculty of vet. Med. Mansoura university1515-1525

Osama,A.;Mohamoud,M.El.and Ramadan,T.M.(2000):Some haematological biochemical alterations on pneumonia and enteritis of neonatal calves.5th.Vet. Med. Zag.Corf. 6673

Petrie, A. and Watson, P. (1999): Statistics for Veterinary and Animal Science 1st Ed. 90-99, The Blackwell Science LTd, United Kingdom.

- Plair, J.E; Lennete, E.H. and Truand, T.P. (1970)** Manual of Clinical Microbiology. Am Society for Microbiology .Betechesda. USA
- Radostitis, O.; Blood, K. and Day, C. (1995):** Veterinary Medicine. 9th Ed. Bailliere Tindall.
- Radostits, O.; Blood, D. and Day, C. (2002):** Veterinary Medicine 10th Ed. Bailliere Tindal.
- Reitman, S. and Frankel, S (1957):** A colorimetric method for determination of serum glutamic oxalacetic and glutamic pyruvic transaminase Am.J. Clin. Path , (28)56- 60.
- Selim, A.M.; Zaki, M.; Abaza, F. and Mousa, H. (1997):** Calf mortality, incidence rate, causes, clinical and laboratory investigation at 6 October Military Farm Nobarria .Zagazig Vet. J., 25 , 25 – 35.
- Sharma, R. and Woldeh, Z. (1991):** Immune responses of lambs experimentally infected with bovine pasteurilla haemolytica .J.Comp. Path. 105 : 157-166.
- Soroor, F. E. (1999):** Comparative histopathological studies on the lung affections of small ruminants at Sharkia Province. M.V.Sc.Fac.Vet. Med. Zag. Univ.
- Swartz, M. (1997):** Use of antimicrobial agents and drug resistance. N.Engl.J.Med. 337 :491– 2.
- Syriopolou, V., Harding, A. and Goldman, A. (1981)** In vitro antibacterial activity of florfenicol analogs of chloramphenicol and thiomphenicol. Anti.Agent Chemoth. 19: 294-29.
- Szasz, G. (1969):** Quantitative determination of gamma glutamyl transferase (GGT) in serum or plasma. Clin.Chem. 22, 124-136.
- Tobin T. (1979):** Pharmacology review: Streptomycin, gentamicin, and the aminoglycoside antibiotics. J.Equine.Med.Surg.:206–212.
- Trinder, P. (1969):** Enzymatic determination of glucose. Ann. Clin. Biochem. 6 : 24-28
- Verma, K., Adams, P.; Puser, T.; Puser, J.D. and Lamendoholas, J. F (1986)** : Pharmacokinetic of florfenicol in veal calves. Annu.Rev.Pharmacol.Thera., 9:412-2976
- Willson, S.; Chruch, T. and Acres, A. (1985):** The influence of feedlot management on an outbreak of bovine respiratory disease. Canadian , Vet. J. 26 , 335-341.

Woldehiwet, Z.; Mamache. B. and Rowan, T.G. (1990): The effects of age, enviromental temperture and relative humidity on the bacterial flora of the upper respiratory tract in calves. Br. Vet. J. (146) 211-218.

Youssef,M.;Wafaa,M.; El-Sadawy , H. A. and Selim, A. M. (1992): Clinical and laboratory studies on an outbreak of bacterial respiratory troubles in buffalo–calves. Egypt. Proc. 5th Sci. Cong. Fac. Vet. Med. Assiut University, 92–103.

Table(1):-Mean rectal temperature of diseased lambs before and after10days post treatment with florfenicol (20 mg/kg. b.wt.) or gentamicin (5 mg/kg b.wt.).

Temperature of diseased lambs											
Drugs	Pretreatment	Days post treatment									
		1	2	3	4	5	6	7	8	9	10
Florfenicol	41.48±0.48	41.04± 0.54	40.13±0.71	39.24±0.51	39.39±0.71	39.18±0.79	38.84±0.61	38.67±0.51	38.60±0.39	38.56±0.27	38.43±0.41
Gentamicin	41.53±0.56	41.17±0.52	41.93±0.45	39.84±0.47	39.73±0.06	39.37±0.53	38.98±0.73	38.75±0.19	38.93±0.78	38.60±0.51	38.63±0.39

Table (2) Bacterial isolates causing pneumonia in lambs at Sharkia Governorate (N=24)

No. of tested Lambs	pasteurella multocida		E- coli		Staph. aureus		Strept. pyogenes		Klebsiella pneumoniae		Past. multocida +E. coli	
	a	b	a	b	a	b	a	b	a	b	a	b
24	7	29.17%	4	16.67%	3	12.50%	3	12.50%	2	8.34%	5	20.82%

a = No. of isolates

b = Percentage of isolates

Table (3):Sensitivity tests of isolated organisms against different antimicrobial agents.

Antibiotic Discs	Disc concentration	pasteurella multoicda	E. Coli	Staph. aureus	Strep. Pyogenes	Klebsiella Pneumoniae	Past.multocida+ E.coli
Florfenicol	30ug	+++	+++	+	++	+	+++
Gentamicin	10ug	+++	+++	++	++	+	++
Ceftiofur sod.	10ug	++	++	++	++	-	++
kanamycin	30ug	++	+	++	+	+	++
Erythromycin	15ug	+	-	++	++	+	+
Spectinomycin	10ug	++	-	++	+	-	+
Flumequine	30ug	+	+	+	+	+	+
Enrofloxacin	10ug	+++	+++	+	+	+	++

Table (4):- Effect of florfenicol (20 mg/kg. b.wt.) or gentamicin (5 mg/kg b. wt.) on Haemogram of pneumonic lambs after I.M. injection for 5 consecutive days at 5, 10, and 20 days post injection

Parameter	Healthy lambs "control" (n=5)	Pretreatment (n=24)	Pneumonic lambs					
			Florfenicol (n=12)			Gentamicin (n=12)		
			Post treatment (days)					
			5 days	10 days	20 days	5 days	10 days	20 days
RBcS (106/cm.m)	8.96±0.46	6.34±0.64**	6.73±0.35**	7.31±0.42*	8.51±0.52	6.43±0.52*	7.18±0.43*	8.49±0.32
Hb (gm/dls)	12.67±0.89	8.59±0.85**	9.45±0.82*	10.58±1.03	11.84±1.16	9.20±0.89*	10.38±0.92	11.62±0.69
P.C.V. %	37.95±1.37	29.78±1.95**	32.67±1.93*	34.83±1.73	36.35±1.84	31.87±1.93*	33.62±1.37*	35.89±1.87
W.B.Cs (103/cm.m)	10.95±0.37	12.47±0.34**	12.05±0.27*	11.87±0.57	10.45±0.62	12.24±0.13**	11.45±0.31	10.36±0.61
Lymphocyte (103/cm.m)	4.12±0.47	2.46±0.34**	2.90±0.16*	3.52±0.19	3.96±0.32	2.74±0.25*	3.39±0.23	3.88±0.32
Neutrophils (103/cm.m)	3.1±0.28	4.62±0.54*	4.39±0.24*	3.62±0.32	3.41±0.31	4.44±0.41*	3.75±0.11*	3.51±0.32
Monocyte (103/cm.m)	1.4±0.19	2.67±0.29**	2.10±0.34*	2.16±0.42	1.95±0.24	2.37±0.21**	2.21±0.23*	1.64±0.31
Eosinophils (103/cm.m)	1.23±0.25	2.72±0.37**	2.66±0.21**	2.57±0.42*	1.11±0.12	2.69±0.36**	2.10±0.24*	1.33±0.23
Platelets (103/cm.m)	379.94±14.73	318.94±12.65**	338.13±12.95*	359.41±19.34	371.98±13.65	331.12±13.54*	355.72±16.75*	368.76±17.84

**P < 0.01 *P < 0.05

Table (5):- Effect of florfenicol (20 mg/kg. b.wt.) or gentamicin (5 mg/kg b. wt.) on enzymes of pneumonic lambs before and at 5, 10, and 20 days post treatment.

Parameter	Healthy lambs "control" (n=5)	Pretreatment (n=24)	Pneumonic lambs					
			Florfenicol (n=12)			Gentamicin (n=12)		
			Post treatment (days)					
			5days	10 days	20 days	5days	10 days	20 days
AST (U/L)	43.73±4.12	64.43±5.94**	57.89±3.43*	51.64±3.89	46.47±3.95	55.83±2.94*	49.84±2.32	45.92±2.83
ALT (U/L)	26.93±3.89	42.73±4.83*	38.94±4.73*	34.51±2.64	32.81±2.03	40.12±2.45*	37.93±2.41*	33.94±2.54
Alk. Ph.(I.U/ml)	26.93±3.25	31.36±2.86	30.73±1.38	28.62±2.76	26.89±1.89	31.84±2.84	29.78±2.65	27.92±1.98
L.D.H. (U/L)	374.64±25.49	391.42±29.14	385.89±5.79	380.92±6.82	376.62±5.93	389.32±4.81	384.27±7.83	376.32±4.98
GGT(U/L)	12.56±1.43	18.65±1.47**	16.98±1.46*	15.73±1.95	14.95±1.63	18.94±1.06**	17.46±1.64*	14.89±1.79

*P < 0.05 **P < 0.01

Table (6):- Effect of florfenicol (20 mg/kg. b.wt.) or gentamicin (5 mg/kg b.wt.) on some biochemical parameters of pneumonic lambs before and at 5, 10, and 20 days post treatment.

Parameter	Healthy lambs "control" (n=5)	Pneumonic lambs						
		Pretreatment (n=24)	Florfenicol (n=12)			Gentamicin (n=12)		
			5days	10 days	20 days	5days	10 days	20 days
Glucose (mg/dl)	88.90±3.29	101.34±2.01**	97.32±2.11*	90.31±2.13	87.43±2.62	98.42±2.14*	95.21±3.16	90.32±2.76
Urea (mg/dL)	20.72±2.30	32.9±2.91**	30.12±1.56**	25.61±1.82	21.98±1.82	29.61±1.52**	26.78±1.12*	23.96±1.59
Creatinine (mg/dL)	2.06±0.31	4.02±0.61**	3.73±0.56*	3.09±0.52	2.30±0.36	3.91±0.44**	3.23±0.34*	2.42±0.42
Calcium (mg/dl)	10.24±0.65	7.34±0.52**	8.38±0.32*	9.45±0.72	10.21±0.52	8.12±0.51*	9.38±0.43	10.13±0.69
Phosphorus (mg/dl)	6.32±0.52	9.34±0.83**	8.45±0.61*	7.52±0.42	6.40±0.52	8.66±0.46**	7.55±0.43	6.32±0.56
Sodium (mEq/l)	146.14±6.03	116.84±6.67**	125.94±5.09*	134.72±4.92	143.63±5.97	121.59±4.91**	130.46±4.58*	141.73±6.38
Potassium (mEq/l)	5.48±0.72	4.21±0.24	4.53±0.42	4.93±0.41	5.32±0.36	4.43±0.51	4.87±0.57	5.25±0.39

*P < 0.05

**P < 0.01

Table (7):- Effect of florfenicol (20 mg/kg. b.wt.) or gentamicin (5 mg/kg b.wt.) on proteinogram of pneumonic lambs before and at 5, 10, and 20 days post treatment.

Parameter	healthy lambs "control" (n=5)	Pneumonic lambs						
		Pretreatment (n=24)	Florfenicol (n=12)			Gentamicin (n=12)		
			5days	10 days	20 days	5days	10 days	20 days
T.P.(gm/dl)	7.79±0.29	5.84±0.80*	6.68±0.42*	7.11±0.48	7.15±0.68	4.87±0.78**	5.64±0.90*	7.47±0.96
Alb.(gm/dl)	3.40±0.28	2.10±0.37**	3.15±0.15	3.32±0.27	3.30±0.28	2.49±0.25*	2.78±0.10*	3.48±0.17
T.glob(gm/dl)	4.39±0.24	3.74±0.15*	3.53±0.19*	3.79±0.57	3.85±0.31	2.38±0.55**	2.86±0.52*	3.99±0.89
A/G ratio	0.77±0.09	0.56±0.06	0.89±0.15	0.88±0.14	0.86±0.17	1.05±0.018	0.97±0. ±0.14	0.89±0.16

*P < 0.05

**P < 0.01

Table (8):- Efficacy of treatment with florfenicol (20 mg/kg. b.wt.) or gentamicin (5 mg/kg b. wt.) to pneumonic lambs.

Drugs	Total number of lambs	3 days post treatment		4 days post treatment		6 days post treatment	
		Number of cured lambs	Percent	Number of cured lambs	Percent	Number of cured lambs	Percent
Florfenicol	12	6	50%	12	100%	-	-
Gentamici	12	5	41.67%	9	75%	12	100%
n							

دراسة على بعض المشاهدات الإكلينيكية الدموية والبيوكيميائية لحالات الالتهابات الرئوية فى الحملان مع محاولات العلاج إيهاب محمد حسين-طارق علام-السيد مسعود

تم إجراء هذا البحث على 29 حمل (30-40 كجم) بمزرعة خاصة بمحافظة الشرقية، أ شتمت على عدد 5 حملان سليمة إكلينيكية وكذلك 24 حمل تعاني من التهابات رئوية مصحوبة بارتفاع درجة حرارتها أعلى من 41 م . قسمت الحملان التى تعاني من الالتهاب الرئوي إلي مجموعتين الثانية والثالثة مصابة وتعالج بالجرعة العلاجية من الفلوروفينكول (20 ملجم/كجم من وزن الجسم) بجرعتين الفرق بينهما 48 ساعة، والجنتاميسين (5ملجم/كجم من وزن الجسم) لمدة خمس أيام على التوالي . تم أخذ عينتين دم من كل حيوان الأولى على ادينا وذلك لدراسة التأثير على صورة الدم والأخرى لفصل المصل وذلك لدراسة التأثير على بعض الوظائف البيوكيميائية. وقد تم عزل ميكروبات الباستريلا ملتوسيدا بنسبة 17 و29%، الميكروبات القولوني العصوي بنسبة 67 و16% استافيلوكوكس اوريس بنسبة 50 و12%، استربتوكوكس بيوجين بنسبة 50 و12% ، كلبسيلا نومنى بنسبة 34 و8%، وعدوى مشتركة (الميكروب العصوي مع باستريلا ملتوسيدا) بنسبة 82 و20%.

وبعمل اختبار الحساسية لهذه المعزولات وجد أن الفلوروفينكول والجنتاميسين الانروفلوكساسين أكثر المضادات الحيوية تأثيرا علي هذه المعزولات . وقد أدى استخدام الفلوروفينكول والجنتاميسين إلى السيطرة بنجاح على هذه المشاكل المرضية . بعد أسبوع من العلاج لم يتم عزل اى ميكروب من الدم واختفت أعراض الالتهابات الرئوية من الحملان المريضة وعادت درجة حرارتها لوضعها الطبيعي واستعادت علامات الصحة وكان لعقار الفلوروفينكول الأفضلية عن عقارالجنتاميسين . يتبين لنا من تلك الدراسة أن الالتهابات الرئوية أحدثت بعض التغيرات فى صورة الدم وبعض الوظائف البيوكيميائية وتشير النتائج أن الالتهابات الرئوية أدت الى حدوث نقص معنوي فى عدد كرات الدم الحمراء، تركيز الهيموجلوبين ،حجم الخلايا المضغوطة، الخلايا الليمفاوية والصفائح الدموية وزيادة معنوية فى كرات الدم البيضاء، الخلايا المتعادلة، الخلايا الحمضية و الخلايا الملتهمة الكبيرة. كذلك تشير النتائج أن الالتهابات الرئوية أدت الى حدوث زيادة معنوية فى الترانس أمينيزسس (AST – ALT)، جاما امينو ترانس امينيز (GGT)، مستوى الجلليكوز فى السيرم، اليوريا، الكرياتينين الفوسفور وزيادة غير معنوية فى مستوى انزيمى الفوسفاتيز القاعدى والكتك ديهيدروجينيز (LDH) والماغنسيوم . كما أن الالتهابات الرئوية أدت الى نقص معنوي فى البروتين الكلى ، الزلال، الجلوبيولين الكلى ، الصوديوم و البوتاسيوم وهذا النقص استمر لمدة أسبوعين بعد إيقاف مما تقدم يتضح أن استخدام الفلوروفينكول والجنتاميسين أدى إلى السيطرة على مشاكل الالتهابات الرئوية البكتيرية وأدت الى عودة وظائف الكبد والكلى وصورة الدم لوضعها الطبيعي.