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COMPARATIVE STUDIES BETWEEN PEFLOXACIN AND TIAMULIN AGAINST MYCOPLASMA IN TURKEY

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ABSTRACT

Samples form lungs, trachea and air sacs were collected from 40 turkey poults suffering from respiratory signs for bacteriological examination for isolation and identification *mycoplasma* spp. The results revealed, 18 (45%) samples were positive (+ve) for *mycoplasma* spp. Antibiogram study of isolates revealed that pefloxacin and tiamulin was effective against *mycoplasma*. A total of 40, one-day old poults provide free from *mycoplasma* infection were divided into 4 equal groups. 1st group healthy negative (-ve control) 2nd, 3rd& 4th groups were artificially infected with *Mycoplasma gallisepticum* (*MG)*, 2nd group infected non treated (+ve control), 3rd group infected treated with 5 mg pefloxacin / kg bwt in drinking water for 5 successive days and 4th groups was infected treated with 25mg tiamulin/kg bwt in drinking water for 5 successive days, At 1st and 10th days post treatment 5 poults from each group were sacrificed for record lesion scores % and two blood samples were taken from each poults for hematobiochemical parameters study. Poults infected with *Mycoplasma gallisepticum* revealed loss of appetite, depression, sneezing, conjunctivitis, frothy exudation in eyes, air sacculitis 7 (70%), pericarditis 7 (70%), perihepatitis 8 (80%) & mortality rate 4 (40%) beside induces significant increase in WBCs, AST ALT, ALP uric acid, creatinine and significant decrease in weight gain. Phagocytic %, index, killing % IgA, IgG, IgM, T protein, albumin and globulin. Medication *mycoplasma gallisepticum* by tiamulin or pefloxacin revealed disappears of clinical signs, reduced mortality rate to10%, mild lesion scores re-isolation rate of *Mycoplasma gallisepticum* from poults treated with pefloxacin was (20%) and (10%) for tiamulin beside improve in hematobiochemical parameters and returned to nearly normal level at 10th day post treatment. It could be concluded that pefloxacin and tiamulin was effective in treatment *Mycoplasma gallisepticum* in poults and ameliorate severity of its lesions besides improving adverse effect in hematobiochemical parameters.

Keyword: *Mycoplasma gallisepticum*; pefloxacin; tiamulin; turkey; hematobiochemical.

INTRODUCTION

Turkey is considered one of the main sources of proteins. Turkey industry in Egypt was progressed in last few years and numerous farms had developed different breeds.

Mycoplasmosis is a contagious disease causing economic losses in poultry (El-Ashram *et al.*, 2021). *MG* infection referred "chronic respiratory disease," in chickens and infect-ious sinusitis in turkeys as

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characterized by nasal discharge, tracheal rale, coughing, and dyspnea (Levisohn and Kleven, 2000). *MG* infection causes economic losses by growth retardation, increased feed conversion rate, increased mortality rate (Kleven, 2008). Controlling *MG* disease on a global level is done by eradication of positive breeder flocks or by vaccination and medication (Raviv and Hey, 2013).

Tiamulin are used to treatment *MG* infection, respiratory and genital-urinary organs mucus are preferred (Bozorgmehri *et al.,* 1998). Tiamulin binds at 50S ribosomal subunit with rRNA in which it prevents correct positioning of tRNA for peptide transferase and subsequent bacterial protein production (Poulsen *et al.,* 2001).

Fluroquinolone compounds are wide spectrum bactericidal activity against mycopla-sma (Andon, 1993). Pefloxacin is one of a third generation of fluoroquinolones with broad spectrum activity against many bacterial diseases in poultry as salmonellosis, infectious coryza and avian mycoplasmosis (Mohamed and Dardeer, 2001).

The purpose of this study was to evaluate the efficacy of pefloxacin and tiamulin against *MG* infected turkey poults together with a special reference to the immune response and some biochemical parameters.

MATERIALS AND METHODS

Drug:

1-Tiamulin (Tiamutin®) water soluble granules contain 45g tiamutin hydrogen fumerate. Produced by Sandoz Company, Austria.

2- Pefloxacin (Peflodad 10 %®) solution was obtained from Dar Al Dawa Vet & Agri Industrial Co. Itd. Jordan. Each ml contains 100mg of pefloxacin base.

Isolation and identification of *Mycoplasma gallisepticum* isolates:

Aseptic 40 swabs (lungs; trachea and air sacs) were tacken from 40 diseased poults suffe-ring from respiratory signs and subjected to bacteriological examination for isolation and identification mycoplasma spp. swabs were immersed into vials containing mycoplasma broth with bacterial inhibitors. Each swab was cultured into pleuropneumonia like organism broth and agar media with inhibitors and indicators for mycoplasma isolation (Adler *et al.*, 1958). Isolates were biochemically identified (Frenske and Kenny 1976).

Birds and experimental design:

About 40, one day-old turkey poults were used in this trail at 14 days of age blood samples were tacken from them then subjected to serological examination by serum plate agglutination test to prove their free from *Mycoplasma* infection then poults were divided into four equal groups. 1st group healthy poults (-ve control), 2nd, 3rd and 4th groups were artificially infected with MG by inoculating in air sac with a pathogenic strain of MG at dose 0.2 ml of 24h broth culture of virulent strain of MG containing $2x10^8$ (CFU)/ml (Moustafa, 2001), 2nd group was infected, non-treated (+ve control), 3rdgroup was infected treated with 5 mg pefloxacin / kg bwt in drinking water for 5 days and 4th groups was infected and treated with 25mg tiamulin/kg bwt in drinking water for 5 days, Treatments was start after appear clinical signs (5 day post infection). Poults were individually weighed at 14th day of age (Initial weight) and at 24th day of age (Final weight) for estimation body weight gain and feed conversion rate.

Sampling:

At 1st and 10th days post treatment 5 poults from each group were sacrificed for record Lesion scores % and two blood samples were taken from each group

1st blood sample was taken in tube contain EDTA for estimation leukocytic count

(Jain, 1986), phagocytic%, index and killing % (Wilkinson, 1977 & Lucy and Larry 1982).

2nd sample was taken in tube for obtain clear serum for estimation T. protein (Doumas *et al.*, 1981) albumin (Drupt, 1974) globulin was calculated as difference between total proteins and albumin, AST and ALT (Reitman and Frankel 1957), ALP (John, 1982), creatinine (Henry, 1979), uric acid (James and White, 1971). Serum immunoglobulins (IgA, IgG & IgM) were performed using SANDWICH Elisa (Erhard *et al.*, 1992)

Re-isolation of *Mycoplasma gallisepticum*
Post poults sacrificed Swabs from air-sac and nasal cavity were taken from all poults post treatment for re-isolation of *MG* post treatment then immersed into vials containing mycoplasma broth medium with bacterial inhibitors for culturing.

F. Serological examination:
Blood samples were collected from wing veins of turkey poults just before infection and at 1st day post treatment for rapid serum plate agglutination test for antibodies to *Mycoplasma gallisepticum* according to Kempf *et al.* (1998).

Statistical analysis: The obtained data was analyzed by using computerized SPSS program version 16 according to Tamhane and Dunlop (2000).

RESULTS

Turkey poults infected with MG showed clinical sign represented by loss of appetite, depression, sneezing, gasping, conjunctivitis, frothy exudation from eye, decrease body weight, increase in FCR and gross pathological lesions {air sacculitis 7 (70%), pericard-itis 9(90%), perihepatitis 8 (80 %)} and mortality rate 4(40%) (Table 2 &3).

Mycoplasma gallisepticum induced significant increase in leukocytic count, serum AST, ALT, ALP, uric acid and cretonne beside significant decrease in phagocytic %, index, killing %, total protein, albumin, globulin coupled with insignificant decrease in IgA, IgG and IgM) allover expermental period post infection (Table 4 & 6).

Medication infected poults using tiamulin or pefloxacin showed disappear of clinical signs, reduced mortality rate to 10%, Re-solution of MG from infected poult treated with pefloxacin or tiamulin were (20%) and (10 %) respectively in comparison with (100 %) of infected non treated poults coupled with mild lesion scores, improve body weights and FCR post treatment (Table, 1, 2 & 3).

leukocytic count, phagocytosis%, phago-cytosis index, killing %, serum total protein, albumin, globulin, IgA, IgG and IgM, AST, ALT, ALP, uric acid, creatinine and returned to nearly normal levels at 10th day post treatment (Table 4,5 & 6).

Table 1: Incidence of the isolated mycoplasma from turkey poults.

Source of swabs	Total No. of swabs	+ve swabes		-ve swabes	
		No	%	No	%
Air sac	15	8	53.33	7	*48.66*
Lungs	15	6	40	9	*60*
Trachea	10	4	40	6	*60*
Total	*40*	*18*	*45*	*22*	*55*

Table 2: Effect of mycoplasma pefloxacin and tiamulin on mortality rate and bacteria re-isolation of turkey poults.

Parameters Groups	Total No	Mortality		*mycoplasma re-isolation*	
		No	%	No	*%*
GP 1	10	00	00	00	*00*
GP 2	10	4	40	6	*100*
GP 3	10	1	10	2	*20*
GP 4	*10*	*1*	*10*	*1*	*10*

Table 2: Effect of mycoplasma, pefloxacin and tiamulin on pathological lesions, mortality rate and bacteria re-isolation of turkey poults.

Parameters Groups	**GP 1**		**GP 2**		**GP 3**		***GP 4***	
	No	**%**	**No**	**%**	**No**	**%**	**No**	***%***
Total No	10		10		10		*10*	
A.sacculitis	00	00	7	70	2	20	1	*10*
Pericarditis	00	00	9	90	1	10	1	*10*
Perihepatitis	*00*	*00*	*8*	*80*	*2*	*20*	*1*	*10*

Table 3: Effect of pefloxacin and tiamulin on body weight of turkey poults (n=5).

Parameters and Groups	**GP 1**	**GP 2**	**GP 3**	**GP 4**
IBW (gm) (14th day of age)	240.13±2.18 a	241.24±1.96 a	245.21±1.86a	243.25±1.64 a
FBW (gm) (24th day of age)	558.98±4.32 a	515.34±2.76 b	555.55±4.76 a	551.21±5.65 a
Weight gain (gm)	318.85±4.84 a	274.10±5.72 b	310.34±3.49 a	307.96±3.64 a
Feed consumpion	518.35	509.28	515.34	508.04
Feed conversion ratio	*1.63*	*1.86*	*1.66*	*1.65*

Means with different superscripts of the same raw indicate significant difference at $P < 0.05$

Table 4: Effect pefloxacin and tiamulin on WBCs, Phagocytosis% and Killing% of poults (n=5).

period	**Parameters and Groups**	**GP 1**	**GP 2**	**GP 3**	**GP 4**
1st day	WBCs X103/µl	13,51±0,24 b	15,83±0,58 a	14,94±0,35 a	14,89±0,49 a
	Phagocytosis	54.89±1.21 a	49.21±1.23 b	51.07±1.12 b	51.12±1.06 b
	Phagocytic index	6.81±0.55 a	4.51±0.28 b	4.89±0.33 b	4.99±0.24 b
	Killing%	68.41±0.96 a	63.03±0.89 b	64.85±0.72 b	65.16±0.55 b
10th day	WBCs X103/µl	13,28±0,47 b	15,58±0,57 a	14,23±0,41 a	14,11±0,69 a
	Phagocytosis	54.96±1.42 a	49.13±1.13 b	53.43±1.57 a	53.38±1.45 a
	Phagocytic index	6.70±0.48 a	4.43±0.39 b	5.57±0.58 a	5.63±0.43 a
	Killing%	*68.73±0.89 a*	*63.21±0.78 b*	*66.79±0.84 a*	*66.90±0.93 a*

Means with different superscripts of the same raw indicate significant difference at $P < 0.05$

Table 5: Effect of pefloxacin and tiamulin on liver and kidney function of turkey poults (n=5).

period	Parameters and Groups		GP 1	GP 2	GP 3	GP 4
1st day	Liver Enzymes (U/L)	AST	79.43±1.0c	85.34±1.16a	84.19±1.21b	84.03±122 b
		ALT	23.38±0.71c	27.04±0.68a	25.13±0.27 b	25.28± 0.28 b
		ALP	108.72±1.17c	115.29±1.61a	113.21±1.5b	113.28±1.49 b
	Kidney Function (gm/dl)	Uric acid	4.14±0.20c	5.41±0.18a	4.82±0.14 b	4.88±0.18 b
		Creatinine	1.22±0.15c	2.04±0.17a	1.79±0.13 b	1.77±0.11 b
10th day	Liver enzymes (U/L)	AST	78.52±1.5b	85.13±1.30a	80.13±1.52 b	80.17±1.21 b
		ALT	29.43±0.6 b	31.3±0.19 a	30.21±0.37 b	30.42±0.54 b
		ALP	112.16±1.1b	117.06±1.23a	113.78±1.9 b	114.21±1.98 b
	Kidney Function (gm/dl)	Uric acid	4.06±0.39 b	5.43±0.20 a	4.21±0.34 b	4.22±0.25 b
		Creatinine	*1.23±0.32 b*	*2.15±0.12 a*	*1.68±0.12 b*	*1.70±0.14 b*

Means with different superscripts of the same raw indicate significant difference at $P < 0.05$

Table 6: Effect of pefloxacin and tiamulin on humeral immunity of turkey poults (n=5)

period	Parameters and Groups		GP 1	GP 2	GP 3	GP 4
1stday	Protein Picture (gm/dl)	T.protein	5.50±0.28 a	4.60±0.15 b	4.70±0.20 b	4.75±0.19 b
		Albumin	3.08±0.14 a	2.45±0.14 b	2.40±0.23 b	2.50±0.19 b
		Globuline	2.42±0.10 a	2.05±0.11 b	2.30±0.14 b	2.25±0.10 b
		A/G ratio	1.27±0.11 a	1.20±0.14 a	1.04±0.10 a	1.11±0.15 a
	Immuno-globulin (gm/100ml)	IgA	3.82±0.41 a	2.89±0.53 a	3.21±0.81 a	3.64±0.47 a
		IgM	5.68±0.22 a	4.48±0.72 a	5.32±0.59 a	5.58±0.38 a
		IgG	9.58±0.37 a	8.32±0.69 a	9.17±0.48 a	9.38±0.70 a
10thday	Protein Picture (gm/dl)	T.protein	5.63±0.25 a	4.71±0.21 b	5.70±0.22 a	5.73±0.19 a
		Albumin	3.03±0.14 a	2.60±0.12 b	2.88±0.19 a	2.90±0.21 a
		Globuline	2.60±0.16 a	2.11±0.11 b	2.82±0.21 a	2.83±0.19 a
		A/G ratio	1.17±0.15 a	1.23±0.12 a	1.02±0.13 a	1.3±0.11 a
	Immuno-globulin (gm/100ml)	IgA	3.79±0.55 a	2.80±0.69 a	3.62±0.43 a	3.76±0.48 a
		IgM	5.89±0.48 a	4.59±0.58 a	5.77±0.39 a	5.82±0.61 a
		IgG	*9.47±0.60 a*	*8.44±0.72 a*	*9.28±0.38 a*	*9.40±0.55 a*

Means with different superscripts of the same raw indicate significant difference at $P < 0.05$

DISCUSSION

Poults infected with *MG* showed clinical signs represented by depression, loss of appetite, sneezing, gasping, conjunctivitis with frothy exudation in the eyes and decreased body weight beside gross pathological lesions as air sacculitis 7(70%), pericarpditis 9(90%), perihepatitis 8 (80%) and mortality rate 4 (40%). Same clinical signs and mortality rate were observed by Saif *et al.* (2007) in broilers suffering from mycoplasmaosis. Same clinical signs were observed by Hany *et al*. (2019) in turkey suffering from mycoplasmosis and Andrea *et al.* (2020) in broilers infected with *mycoplasma*. Avian mycoplasmosis induced decrease in weight gain (Jay *et al.*, 2021).

Infected poults treated with tiamulin or pefloxacin showed disappear of clinical signs, reduced mortality rate to10% beside mild lesion scores, improve body weights

and feed conversion rate. This improvement in body weights and feed conversion rate post treat-ment may be due to bactericidal effect of used drug on *MG*. Fluoroquinolones was effective in *MG* in broilers (Kempf *et al.,* 1998). Pefloxacin treated *MG* revealed disappear clinical signs and reduced mortality rate (Mohamed and Mona 2002). treatment infected broilers by tiamulin reduced clinical signs, lesion scores and mortality (Zakeri and Kashefi 2011). Tiamulin effective against *MG* in broilers (Farran *et al.,* 2018).

Re-isolation rate of MG from poults treated with pefloxacin was (20%) and (10 %) for tiamulin. Pefloxacin have bactericidal activity against MG infection and reduced re-isolation MG (El Sayed and Mahmoud 2003). Laying hens infected with mycoplasma treated with tiamulin reduced MG re-isolation (Masour *et al.,* 2017).

In the present study, *MG* infection induces leukocytosis beside Significant decrease in phagocytic %, index and killing %. Broilers infected with *MG* showed leukocytosis, decrease in killing % and phagocytosis (Avakian and Ley 1993). Mycoplasma infection revealed leucocytiosis and decrease phagocytosis (Malhat *et al.,* 2005). *MG* induce leukocytosis and decrease in phagocytosis and killing % (Mohamed *et al.,* 2007).

Medication *MG* infected poult by tiamulin or pefloxacin revealed improved in WBCs, phagocytosis and killing % and reterened to normal levels at 10th day post treatment. Our results were agreed with those previously reported by Wieliczko *et al.* (1988) in broilers infected with *MG* and treated by taimolin. Pefloxacin have good efficacy in treatment *MG* and improve phagocytosis and killing % (Mohamed and Mona 2002).

Our findings revealed, significant increase in AST, ALT, ALP, uric acid and cretonne allover experimental period post infection of poults with *MG*. These finding may be due to damage of hepatocyte by bacterial toxin (Coles, 1986). These results come in harmony with results reported by Abdalla and Adayel (2006) stated that *MG* infection in broiler induce elevation in liver enzymes, uric acid and creatinine in chickens experimentally infected with *MG* Infected poults treated with tiamulin or pefloxacin showed improved in liver enzymes, uric acid and cretonne. Same results were reported Mohamed and Mona (2002) stated that chickens infected with *MG* treated with pefloxacin revealed improved in liver enzymes and kidney function (Mohamed and Mona (2002). Tiamulin effective against *MG* in broilers and improved in AST, ALT, ALP, uric acid and cretonne (Bastamy *et al.,* 2021).

In the present work, serum total protein, albumin and globulin significantly decreased in poults infected with *MG*. Reducton in total protein and albumin may be due to necrotic effect of *Mycoplasma* toxin on hepatocytes which are the main site of albumin synthesis (Sorkar *et al.,* 2005). *Mycoplasma gallisepticum* induce significant reduction in total protein, albumin and globulin in broilers (Malhat *et al.,* 2005 and Mohamed *et al.,* 2007). Laying hens infected with mycoplasma gallisepticum showed decrease in serum total protein, albumin and globulin (Masour *et al.,* 2017).

Infected poults treated by tiamulin or pefloxacin revealed improved in protein profile and reterened to normal levels at 10thday post treatment. Tiamulin has good effect in treatment *mycoplasma gallisepticum* infected broilers and improved protein profile (Zakeri and Kashefi 2011). Also, Masour *et al.* (2017) stated that taimulin treatment infected broilers by *mycoplasma gallisepticum* showed improved protein picture.

Infected poults with *MG* revealed insignificant decrease in IgA, IgG and IgM allover experimental period post infection Mycoplasma infection induced reduction in

immune-globulin (Romero *et al.*, 2001). Same change in immunoglobulin was reported by Wijesurendra *et al.* (2017) in poults infected with *MG*.

Infected poults treated with tiamulin or pefloxacin showed improved in IgA, IgG, and IgM and retented to nearly normal levels at 10th days post treatment. Improved in IgA, IgG and IgM post treatment may be due to antibacterial effect of used drugs against *MG* (Abd EI-Aziz 2002).

It could be concluded that pefloxacin and tiamulin was effective in treatment of MG in turkey and ameliorate severity of lesions besides improve adverse effect in biochemical and immunological parameters of the infected turkey poults.

REFERENCES

Abd El-Aziz, M. (2002): Handbook of Veterinary Pharmacology, 5th Ed.

Adayel, S. and Abdalla, O. (2007): Efficacy of pefloxacin against salmon-ellosis in balady chicks. Zag. Vet. J., 35 (1): 71-78.

Adler, H.E.; Fabricant, J. and Berg, J. (1958): Symposium on chronic respiratory diseases of poultry. I. Isolation and identification of pleuropneumonia-like organisms of avian origin. Am. J. Vet. Res. 19 440–447.

Andon, A. (1993): Fluoroquinolone pharmacology. Bull Acad. Fran 65: 27-29

Andrea, M.; Michele, G.; Ilenia, R.; Miklós, G. and Salvatore, C. (2020): Molecular Differentiation of Mycoplasma gallisepticum Outbreak: A Last Decade Study on Italian Italian Farms Using GTS and MLST. Vaccines 8, 665-278

Avakian, A. and Ley, D. (1993): Protective immune response to Mycoplasma gallisepticum in respiratory-tract in infected chickens. Avian Dis. 37:697-705

Bastamy, M.; Raheel, I.; Ellakany, H. and Orabi, A. (2021): Study of minimum inhibitory concentration against local field isolates of Mycoplasma gallisepticum from Egyptian broiler and layer chicken flocks. Inter. J of Vet. Sci. 10(10) 124-130.

Bozorgmehri, F.; Fotwati, A. and Shjadost, B. (1998): Diseases of Poultry, Training and Res. Unit of Agri Assof Kosar Economic p. 59-69.

Coles, E. (1986): Vet. Clinical Pathology. 4thEd. W.B. Saunders Comp., Philadelphia, Toronto, Mexico, Rio de Janeiro, Sydney, Tokyo, Hong Kong.

Doumas, B.; Carter, R.; Peers, T. and Schaffer, R. (1981): Method for determination-of total protein in serum. C lin. Chem. 27.1642

Drupt, F. (1974): determination of albumin. Phar. Bio. (9)

El-Ashram, S.; Abdel-Alim, G.; Abdelhamid, T. and Deif, H. (2021): prevalence of mycoplasmosis in broiler and layer in Giza, Egypt. Plos One 16(7) 60-71

El-Sayed, E. and Mahmoud, A. (2003): efficacy of doxycycline and/ or enro-floxacin in treatment of mycoplasma in broilers. Zag. Vet. j. 31 (2) 48- 57.

Erhard, M.; Vonquistrp, l.; Kasper, B. and Kiinlman, R. (1992): Develop-ment of specific enzyme linked immunosorbent antibody assay for detection immune-globulins G. M. A. by monoclonal antibodies. Poltry Sci 71: 302 –310.

Farran, M.; Shaib, H. and Majed, H. (2018): Evaluation of Antibiotics to Control Mycoplasma gallisepticum in Broilers. Poult Fish Wild Sci 6(1)91-99

Frenske, J.D. and Kenny, G.E. (1976): Role of arginine deaminase in growth of Mycoplasma horminis. J. Bacteriol., 125: 501.

Hany, F.; Hatem, S. and Gado, R. (2019): Effect of mixed experimental infection with Mycoplasma

gallisepticumin broiler chickens. Alex J of Vet. Sci. 61(1): 68-78

Henry, R.J. (1979): Determination of serum creatinine. Clinical Chemistry, rinciples and Techniques 2nd Ed., Harper and Row P. 525.

Jain, N. (1986): Schalm Vet. Haematology 4thEd, Lea & Fibiger Philadelphia, USA.

James, J. and White, W. (1971): Colorimetric estimation of serum uric acid. J. Clin. Chem., 17(3): 158-160.

Jay, P.; Piyush, T.; Yarvendra, S. and Sandip, K. (2021): Insights on Mycoplasma gallisepticum and Mycoplasma synoviae infection in poultry: a systematic review. j. of Animal Biotechnology40 (2) 321-332

John, D. (1982): laboratory mothed for determination of alkaline phosphatas 9th Ed 580-581.

Kempf, I.; Cacou, P. and Bennejean, G. (1998): Evacuation de l' efficacite de la kitasamycine VP 2674 chez des *Mycoplasma gallisepticum*. Rec. Med. Vet., 164: 63-69.

Kleven, S. (2008): Control of avian mycoplasma infections in commercial poultry Avian Dis, 52 (1) 367-374.

Levisohn, S. and Kleven, S. (2000): Avian mycoplasmosis (Mycoplasma gallisepticum) rev Sci. Techn, 19 (2) 425-442.

Lucy, F. and Larry, D. (1982): Ontogeny and line diference as in mitogenic responses of chicken lymphocytes. Poultry Scien, 62: 79-94.

Malhat, S.; Ayoub, A. and Mankarios, E. (2005): Effect of kitasamycin on mycoplasma gallisepticum & immune response in broilers. Zag. Vet. J33, 32-40.

Masour, E.; Hend, M.; Magda, N.; Mona, S. and Nahad, K. (2017): Efficacy of tiamulin in laying hens infected with mycoplasma. Ani. Heal Res. Inst. J. 5(4 A) 543-552.

Mohamed, M. and Mona, M. (2002): Efficacy of pefloxacin on mycoplasma infection in chickens. Vet. Med. J., (Giza), 50 (4): 733-739.

Mohamed, E. and Dardeer, M. (2001): Influence of combination of BCG vaccine and pefloxacin in chickens experimentally infected with Mycoplasma gallisepticum. J. Egypt. Vet. Med. Associ., 61 (2): 281-292.

Mohamed, A.; El-Nabtity, S. and Hussein, S. (2007): Effect of kitasamycin on mycoplasma gallisepticum infection in broiler biochemica nd pathological tudies. 5th Int. Sci. Conf., Mansoura 1352-1359

Moustafa, Zeinab, R. (2001): Evaluation of some mycoplasma vaccines in layer breeders. Ph D. Thesis, Fac. Vet. Med., Moshtohor. Banha University.

Poulsen, S.; Karlsson, M. and Vester, B. (2001): The pleuromutilin drug tiamulin and valnemulin bind to RNA at peptidyl transferase centre on ribosome. Mol. Micro. 41(1)51-57.

Raviv, Z. and Hay, D. (2013): Mycoplasma gallisepticum infection Disease. E. Swayn (Ed.), Diseases of poultry (13th edition.), Ames, Iowa pp. 877-89.

Reitman, S. and Frankel, S. (1957): Colorimetric determination of S.AST, S. ALT enzymatic activity. An. J. Clin. Path, 28: 56.

Romero, R.; Reyes, J. and Hadden, J. (2001): Immunomodulatory properties of Mycoplasma pulmonis. III. Lymphocyte stimulation and cytokine production by Mycoplasma pulmonis products. Int Immunophar. 1.99-107.

Sorkar, S.; Rahman, M.; Amin, K.; Rhan, M. and Rahman, M. (2005): Seroprevalence of Mycoplasma gallisepticum infection of chicken in model breeder poultry farms of Bangladesh. Int. J. Poult. Sci., 4 (1): 32-35.

Saif, Y.; Barnes, H.; Gilsson, J; Fadly, A.; Mc Dongald, L. and Swayne, D. (2007): Diseases of Poultry. 12thed. Iowa state uni. Press (Blackwell Publishing Com), pp.31-56.

Tamhane and Dunlop (2000): Statics and data analysis from elementary to

interme-diate. Upper Saddle River, USA.

Wieliczko, A.; Mazurkiewicz, M. and Pawiak, R. (1988): Efficacy of some antibiotics in controll mycoplasmosis in chicks. Meducuna. Vet. 2: 88-91

Wijesurendra, D.; Bacci, B. and Browning, G. (2017): Immune responses to vaccination and infection with Mycoplasma gallisepticum in turkeys. Avian Pathol. 46(5): 464-473.

Wilkinson, P. (1977): Technique in clinical immunology. Ed. By Thompson RA., Puplication .USA.P.201.

Zakeri, A. and Kashefi, P. (2011): efficacy of tiamulin in infected broiler and layer with Mycoplasma gallisepticum. Afr J Pharm Pharm 5: 178-181.

دراسات فارماكولوجية على البيفلوكساسين والتيمولين فى بدارى تسمين الرومى

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تم تجميع مسحات من الرئتين ، القصبة الهوائية والحويصات الهوائية من 40 طائر رومى مريضة تعانى من امراض تنفسية للفحص البكتيريووجى لعزل وتصنيف البكتيريا المسببة للامراض التنفسية. وتم عزل الميكوبلازما فى عدد 18(45%) وبعمل اختبار الحساسية للمعزولات وجد انها حساسة للتيمولين والبيفلوكساسين . لذلك أجريت هذه الدراسة لمعرفة تاثير التيمولين والبيفلوكساسين على الميكوبلازما وتاثير الميكوبلازما على كرات الدم البيضاء وبعض الوظائف البيوكيميائية والمناعية. اجريت الدراسةعلى عدد 40 كتكوت رومى عمر يوم واحد وعند اليوم الرابع عشر من العمر يتم تقسيمهم إلى 4 مجموعات متساوية (10 كتكوت بكل مجموعه) .المجموعة الأولى مجموعة ضابطة ، المجموعات الثانية ، الثالثة والرابعة تم عدوتهم عدوى اصطناعية بالميكوبلازما جليسيبتكم. المجموعة الثانية تم تركها بدون علاج (مجموعة مصابه وغير معالجة)، المجموعة الثالثة مصابة تم علاجها بالبيفلوكساسين بجرعة 5 محم / لتر من مياة الشرب يوميا لمدة 5 أيام متتالية والمجموعة الرابعة مصابة وتم علاجها بالتيمولين بجرعة 25 محم / لتر من مياة الشرب يوميا لمدة 5 أيام متتالية عند اليوم الاول والعاشر من نهايه العلاج تم أخذ عينتين دم من وريد الجناح العينة الأولى على هيبارين لدراسة التأثيرات على كرات الدم البيضاء وقوة اللتهام والأخرى لفصل المصل وذلك لقياس بعض المؤشرات البيوكيميائية والمناعية .

الإصابة بالميكوبلازما جليسيبتكم في كتاكيت الرومى ادت إلى ظهور أعراض مرضية وأدت إلى زيادة نسبة الوفيات (40%) ومعدل التحويل الغذائى ونقص فى وزن الجسم ووزن الجسم المكتسب وأدت إلى وجود زيادة معنوية في كرات الدم البيضاء ، انزيمات الكبد (ALT-AST والفوسفاتيز القاعدي) ، اليوريا والكرياتين ونقص معنوي فى , قو اللتهام والقتل,IgA , IgG and IgM البروتين الكلى, الجلوبيولين, الزلال .

وقد أتضح من هذة الدرا سة أن عقارى البيفلوكساسين والتيمولين أدى إلى اختفاء الأعراض وقلل نسبة الوفيات وتحسنت وزن الجسم المكتسب ومعدل التحويل الغذائى والوظائف البيوكيميائية والمناعية وكان التيمولين ذو كفاءة عالية عن البيفلوكساسين.

من مجموع ما تقدم من نتائج نستخلص أن الاصابة بالميكوبلازما جليسيبتكم في كتاكيت الرومى تودي إلى حدوث تغيرات في بعض الوظائف البيوكيميائية والمناعية ولكن عقارى البيفلوكساسين والتيمولين لهم تاثير جيد فى عاج الميكوبلازما لذلك ينصح باستخدام البيفلوكساسين واتيمولين فى علاج الاصابة بالميكوبلازم فى بدارى تسمين الرومى بكل امان.