

Pharmacological effect of synbiotic and phytobiotic in kidney function and some blood parameters of chicken

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Abstract

The aim of this research was to study the effects of dietary supplementation of synbiotic, phytobiotics and their mixture on kidney functions, some blood parameters and histological criteria of broilers. A total of 200 broiler chicks were randomly chosen and divided into eight groups (25 birds in each). The first four groups were unvaccinated chicken which received a basal diet (group 1) or the same diet supplemented with 1g synbiotic /kg body weight (group 2), 1g phytobiotic /kg body weight (group 3) and 1g synbiotic plus 1g phytobiotic/kg body weight (group 4). The second four groups were vaccinated chicken and fed the same previous treatments with groups 5, 6, 7 and 8, respectively. Therapeutic dose of synbiotic and phytobiotic or their mixture (1ml/ kg. body weight) orally for 3 successive days tended to decrease uric acid and creatinine in unvaccinated and vaccinated chicken at 7, 14 and 21 day. In this study uric acid and creatinine levels resulted in decrease, showing a significant improvement of kidney functions. Some different parameters of blood and histological criteria showed normal measurements with no adverse effect of treatments.

Keywords: Synbiotic; Phytobiotic; Vaccinated; Unvaccinated; Chicken.

1. Introduction

Feed additives are used in animals for a number of different reasons: effective as antibiotic to improve the health, performance of broiler chickens, growth promotion and increase immune response of chickens. (Murarolli et al., 2014).

Synbiotic is defined as a mixture of probiotic and prebiotic that beneficially affect the host by: improving the survival and activity of beneficial microorganisms in the gut. (Awad et al., 2008).

Phytobiotics can be defined as plant derived products added to feed to improve performance. They were originated from leaves, roots, tubers or fruits of herbs, spices and other plants. They may be available in solid, dried, and ground forms, or as extracts (essential oils). In simple terms, phytobiotics are products of plant origin, and preparations such as thyme, oregano, turmeric and garlic are gaining interest among researchers and poultry producers.

Phytobiotic or phyto-genic as feed additive used as pharmaceuticals in alternative medicine and as a natural therapy (Amad et al, 2011). Both plant extracts and essential oils have been reported to have antimicrobial properties against a wide range of pathogenic microbial organism in vitro and in vivo (Erdogan et al. 2010). Effects of the Dietary Inclusion of a Probiotic, a Prebiotic or their Combinations on the Growth Performance of Broiler Chickens were studied by Alaeldein et al (2015).

The aim of this experiment was to study the effect of synbiotic and phytobiotic or their mixture on kidney function, some blood parameters and histological criteria with unvaccinated and vaccinated chicken.

2. Materials and methods

2.1. Drugs

2.1.1. Synbiotic

a) Lactulose (lactulose 67%)

This medication is a laxative used to treat constipation. It may help to increase the number of bowel movements per day and the number of days you have a bowel movement. Lactulose is a colonic acidifier that works by increasing stool water content and softening the stool.

b) lacteol fort (Lactobacillus LB) 6 Sachets

Composition: Each Sachet contains: Lactobacillus LB, Corresponding to lactobacillus delbruekii and lactobacillus fermentum. Treatment of acute and chronic diarrhea.

2.1.2. Phytobiotic

a) Ropadiar 20%

Composition: carvacrol (oregano oil), thymol (oregano oil), propylene glycol, polysorbate 80 E 433, alpha tocopherol (Vit.E). It was used as 1-2 ml per 10 litter water for 3 days. The product was used to improve productive efficiency for broiler chicken.

2.2. Vaccine are used for increase immune responses against the most economically

Important chicken diseases (new castle vaccine)

2.3. Instrument

- 1) Neubour's haemocytometer (for RBCs and WBCs count).
- 2) Centrifuge (MLWT 52-1 Germany) was used for separating serum.
- 3) Wintrobe haematocrit tubes for packed cell volume determination.
- 4) Deep freeze (-20 co) (Sital co., A.R.E.) was used for keeping serum samples.
- 5) Microtome (American Optical Company, U.S.A) was used for sectioning the tissues for histopathological studies.
- 6) 6-Ordinary microscope (Car I- Zeiss 0.65) was used for histopathological examinations
- 7) Other equipments: beakers, bottles, cotton, flasks, forcipes, gauze, graduated cylinders, , scissors, and syringes were used.

2.4. Chicks and experimental design

200 chicks (one day old) were randomly chosen and divided into 8 groups, each group contains :

Group (1): 25 chicks were served as normal non treated group considered as control group. Group(2) : 25 chicks of 14 day ages non vaccinated with ND were administrated 1 ml synobiotic /kg body weigh orally for 3 days. Group (3) : 25 chicks of 14 day ages non vaccinated with ND were administrated 1 ml phytobiotic /kg body weigh orally for 3 days .Group(4) : 25 chicks of 14 day ages non vaccinated with ND were administrated 1 ml mix of synobiotic and phytobiotic /Kg body weight for 3 days Group (5) : 25 chicks were served as normal vaccinated group considered as control group. Group (6): 25 chicks of 14 day ages vaccinated with ND were administrated 1 ml synobiotic /kg body weight orally for 3 days. Group (7) : 25 chicks of 14 day ages vaccinated with ND were administrated 1 ml phytobiotic /kg body weight orally for 3 days and Group (8) : 25 chicks of 14 day ages vaccinated with ND were administrated 1 ml mix of synobiotic and phytobiotic /Kg body weight for 3 days .

2.5. Sampling

Blood samples were taken at the end of 7th day, 14th day and 21th post- treatment in all groups. Five birds of each group were sacrificed for collection of blood samples. Two blood samples were taken from each group for biochemical and hematological studies. The first blood sample was collected without anticoagulant for separation of clear serum for biochemical analysis. These serum samples were used for biochemical analysis to determine some blood parameters, uric acid and creatinine concentration. The second sample of blood was collected in test tube mixed with heparin as anticoagulant. The sample was shaken several times to ensure mixing of blood with anticoagulant. These blood samples were used for hematological studies to determine erythrocytic count and total leucocytic count according to Natt and Herrick (1952). Hemoglobin concentration was determined according to Wintrobe (1967), while packed cell volume was determined as described by Cohen (1967).

2.6. Serum biochemical analysis

Blood samples which taken at the end of 7th, 14th and 21th day and collected without anticoagulant were used to determine some blood parameters. Serum uric acid was determined according to White et al. (1970), while serum creatinine was determine as described by Foline (1934)

2.7. Hematological studies

Hemoglobin concentration, erythrocyte count and white blood cells were counted by using automatic blood cell counter (model HA-VET CLINDIAG).

2.8. Histopathology study

The treated chicks were sacrificed at 7th , 14th and 21th days post treatment. Specimens were collected from liver, thymus, bursa and kidney from each sacrificed tested chicks and fixed directly in formalin 10 % . The fixed tissues in formal were processed by dehydration in different concentrations of ethanol ,cleared with xylol and embedded in paraffin, serial sections of 4-5 microns ,which were stained with Hematoxylin and Eosin (Banchroft and Gamble, 2008) for histopathology examinations.

3. Statistical analysis

Statistical analysis was conducted with the Statistical Package for Social Science (SPSS 16 Inc. Released, 2009) to determine if variables differed among groups. Comparison among means was conducted by one-way ANOVA and subsequent Duncan (1955), Probability values of less than 5% ($p \leq 0.05$) were considered significant

4. Results

4.1. Effect on kidney function

4.1.1. Effect on serum uric acid

Table (1) and figure (1) showed the effect of administration synbiotic and phybiotic and mixture of them in unvaccinated and vaccinated chicken. Demonstrated therapeutic dose of synbiotic and phybiotic (1ml/kg body weight) orally for 3 days showed decrease in uric acid level at (7day, 14 day ,21day) compared to control group with unvaccinated chicken and significant decrease in uric acid level at 14 and 21 day in vaccinated chicken. Phybiotic additive decrease uric acid concentration in both unvaccinated and vaccinated chicken during all period compared to control group .Mixture of synbiotic and phybiotic showed significant decrease in uric acid level with unvaccinated and vaccinated chicken during the successive periods.

4.1.2. Effect on serum creatinine

Effect of administration synbiotic and phybiotic and mixture of them in unvaccinated and vaccinated chicken are shown in Table(2) and figure(2).Therapeutic dose of synbiotic and phybiotic (1ml/kg body weight) were orally for 3 days. Demonstrated synbiotic (1ml/kg body weight) in unvaccinated and vaccinated chicken showed decrease of creatinine level at (7day, 14 day and 21 day), but the creatinine level at 14 and 21 day with vaccinated chicken was significant decrease compared to control group . Administration of phybiotic (1ml/kg body weight) in non vaccinated chicken showed decrease of creatinine level at (7day,14 day ,21day) compared to control group and significant decrease in vaccinated chicken at the same periods. Mixture of synbiotic and phybiotic showed significant decrease in creatinine level with unvaccinated and vaccinated chicken during all periods.

Table 1: Uric Acid (Mg/Dl) (Mean \pm SE)

Groups		Period after (days)		
		7	14	21
Non vaccinated	Control (-ve)	9.39 \pm 0.18 ^a	9.39 \pm 0.46 ^a	9.49 \pm 0.39 ^a
	Synbiotic (1 ml/kg)	9.25 \pm 0.42 ^{ab}	8.96 \pm 0.10 ^{ab}	8.63 \pm 0.36 ^{ab}
	Phybiotic (1 ml/kg)	9.17 \pm 0.20 ^{ab}	8.98 \pm 0.14 ^{ab}	8.48 \pm 0.33 ^b
	Synbiotic + hytobiotic (1 ml /Kg)	8.37 \pm 0.3 ^b	8.41 \pm 0.29 ^b	8.13 \pm 0.41 ^b
	Control (+ve)	9.48 \pm 0.32 ^a	9.26 \pm 0.22 ^a	9.69 \pm 0.27 ^a
	Synbiotic (1 ml/kg)	8.81 \pm 0.34 ^{abc}	8.31 \pm 0.23 ^b	8.15 \pm 0.25 ^{bc}
Vaccinated	Phybiotic (1 ml/kg)	8.17 \pm 0.23 ^{cd}	8.54 \pm 0.27 ^b	7.92 \pm 0.17 ^{bc}
	Synbiotic + hytobiotic (1 ml /Kg)	7.63 \pm 0.25 ^d	7.39 \pm 0.23 ^c	7.30 \pm 0.37 ^c

a, b & c: There is no significant difference ($P>0.05$) between any two means, within the same column have the same superscript letter.

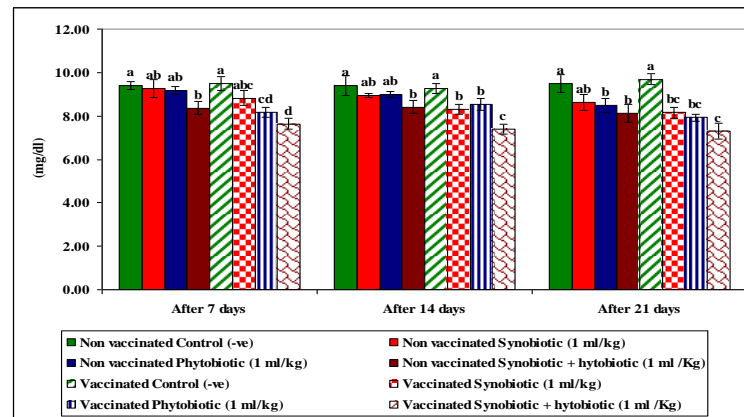


Fig. 1: Uric acid.

Table 2: Creatinine (Mg/Dl) (Mean \pm SE)

Groups		Period after (days)		
		7	14	21
Non vaccinated	Control (-ve)	0.33 \pm 0.01 ^a	0.32 \pm 0.01 ^{ab}	0.31 \pm 0.01 ^{ab}
	Synbiotic (1 ml/kg)	0.31 \pm 0.02 ^{ab}	0.31 \pm 0.01 ^{abc}	0.32 \pm 0.02 ^a
	Phybiotic (1 ml/kg)	0.31 \pm 0.01 ^{ab}	0.33 \pm 0.02 ^a	0.32 \pm 0.02 ^a
	Synbiotic + hytobiotic (1 ml /Kg)	0.29 \pm 0.02 ^{ab}	0.28 \pm 0.01 ^{bc}	0.27 \pm 0.02 ^{bc}
	Control (+ve)	0.33 \pm 0.01 ^a	0.30 \pm 0.01 ^{abc}	0.32 \pm 0.01 ^a
	Synbiotic (1 ml/kg)	0.30 \pm 0.01 ^{ab}	0.30 \pm 0.01 ^{abc}	0.31 \pm 0.02 ^{ab}
Vaccinated	Phybiotic (1 ml/kg)	0.29 \pm 0.01 ^{ab}	0.30 \pm 0.01 ^{abc}	0.29 \pm 0.01 ^{abc}
	Synbiotic + hytobiotic (1 ml /Kg)	0.28 \pm 0.01 ^b	0.27 \pm 0.01 ^c	0.25 \pm 0.01 ^c

a, b & c: There is no significant difference ($P>0.05$) between any two means, within the same column have the same superscript letter.

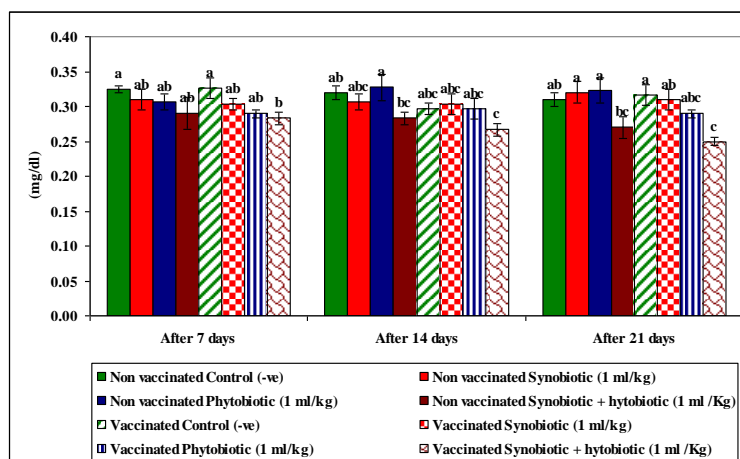


Fig. 2: Creatinine.

4.2. Effects on hematological parameters

4.2.1. The effect on hemoglobin (Hb)

Therapeutic dose of synbiotic and phybiotic (1ml/kg body weight) or mixture of them orally for 3 days on Hb level in both unvaccinated and vaccinated chicken are shown in Table (3) and figure (3). Demonstrated synbiotic (1ml/kg body weight) in non vaccinate chicken showed decrease of Hb level at (7 day and 21 day) compared to control group and revealed somewhat increase level at 14 day with unvaccinated chicken, showing decreasing level at all time in vaccinated chicken. Administration of phybiotic (1ml/kg body weight) orally for 3 days in unvaccinated and vaccinated chicken showed increase of Hb level at (7day,14 day) compared to control group and slight decrease level at 21 day. Mixture of synbiotic and phybiotic showed excessive increase in Hb level with both unvaccinated and vaccinated chicken during all periods, while the Hb level in unvaccinated chicken at 14 day was significant decrease.

Table 3: Hb (G/Dl) (Mean \pm SE)

Groups		Period after (days)		
		7	14	21
Non vaccinated	Control (-ve)	10.23 \pm 0.09 ^{abc}	10.47 \pm 0.23 ^{bc}	11.09 \pm 0.42 ^{ab}
	Synbiotic (1 ml/kg)	9.57 \pm 0.21 ^c	11.04 \pm 0.19 ^b	11.07 \pm 0.19 ^b
	Phytobiotic (1 ml/kg)	11.00 \pm 0.58 ^a	10.66 \pm 0.31 ^b	10.74 \pm 0.22 ^b
	Synbiotic + hytobiotic (1 ml /Kg)	10.50 \pm 0.41 ^{abc}	14.02 \pm 0.27 ^a	12.19 \pm 0.74 ^a
	Control (+ve)	9.70 \pm 0.31 ^{bc}	10.23 \pm 0.09 ^{bc}	11.42 \pm 0.29 ^{ab}
Vaccinated	Synbiotic (1 ml/kg)	10.00 \pm 0.58 ^{abc}	9.68 \pm 0.35 ^c	9.62 \pm 0.34 ^c
	Phytobiotic (1 ml/kg)	10.63 \pm 0.23 ^{ab}	10.28 \pm 0.34 ^{bc}	10.41 \pm 0.26 ^{bc}
	Synbiotic + hytobiotic (1 ml /Kg)	10.00 \pm 0.18 ^{abc}	10.70 \pm 0.39 ^b	11.06 \pm 0.09 ^b

a, b & c: There is no significant difference ($P>0.05$) between any two means, within the same column have the same superscript letter.

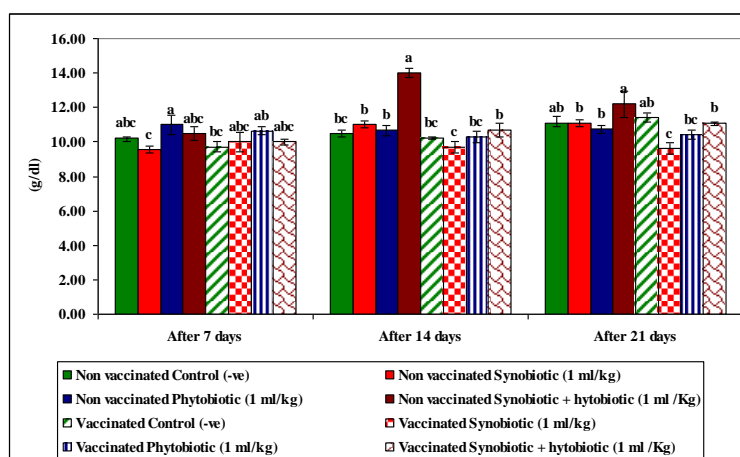


Fig. 3: Hb.

4.2.2. The effect on RBC

Table (4) and figure (4) showed the effect of administration synbiotic and phybiotic and mixture of them in unvaccinated and vaccinated chicken. Therapeutic dose of synbiotic and phybiotic (1ml/kg body weight) orally for 3 days on RBC showed increase in

RBC level with unvaccinated and vaccinated chicken at (7 day,14 day,21day) compared to control group, while RBC level showed significant increase at 7 and 14 day with all chicken. The same previous trend was observed with mixture of them during all periods.

Table 4: Rbcs (X106) (Mean \pm SE)

Groups	Period after (days)			
	7	14	21	
Non vaccinated	Control (-ve)	1.67 \pm 0.33 ^d	1.68 \pm 0.33 ^c	2.90 \pm 0.45 ^a
	Synobiotic (1 ml/kg)	2.41 \pm 0.29 ^{bc}	3.01 \pm 0.02 ^{ab}	2.92 \pm 0.07 ^a
	Phytobiotic (1 ml/kg)	2.58 \pm 0.30 ^{abc}	3.27 \pm 0.23 ^a	3.00 \pm 0.06 ^a
	Synobiotic + hytobiotic (1 ml /Kg)	3.28 \pm 0.37 ^{ab}	2.94 \pm 0.56 ^a	3.51 \pm 0.39 ^a
Vaccinated	Control (+ve)	2.21 \pm 0.23 ^{cd}	2.05 \pm 0.6 ^{bc}	2.73 \pm 0.36 ^a
	Synobiotic (1 ml/kg)	3.33 \pm 0.29 ^a	2.68 \pm 0.31 ^{abc}	2.83 \pm 0.16 ^a
	Phytobiotic (1 ml/kg)	2.46 \pm 0.29 ^{abcd}	3.14 \pm 0.3 ^{ab}	3.14 \pm 0.30 ^a
	Synobiotic + hytobiotic (1 ml /Kg)	3.05 \pm 0.19 ^{abc}	3.18 \pm 0.41 ^{ab}	2.85 \pm 0.25 ^a

a, b & c: There is no significant difference ($P>0.05$) between any two means, within the same column have the same superscript letter.

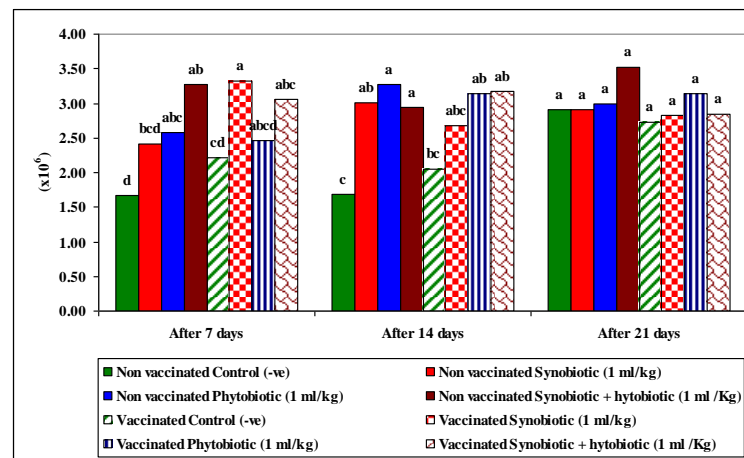


Fig. 4: RBCs.

4.2.3. The effect on HTC

The administration synobiotic and phyobiotic and mixture of them in unvaccinated and vaccinated chicken are shown in Table (5) and figure (5). The dose of administration of synobiotic and phyobiotic (1ml/kg body weight) orally for 3 days showed significant decrease in HTC level at (7 day,14 day) with unvaccinated and excessive decrease in vaccinated chicken compared to control group. HTC level with mixture of them in unvaccinated chicken showed significant decrease at 7 day, while at 14 and 21 day tended to increase level compared to control group. The HTC level recorded lower concentration with vaccinated chicken at all times.

Table 5: Haematocrit (%) (Mean \pm SE)

Groups	Period after (days)			
	7	14	21	
Non vaccinated	Control (-ve)	36.33 \pm 0.33 ^a	36.33 \pm 0.33 ^{ab}	38.67 \pm 0.33 ^b
	Synobiotic (1 ml/kg)	33.43 \pm 0.27 ^b	34.22 \pm 0.32 ^{cd}	39.96 \pm 0.06 ^{ab}
	Phytobiotic (1 ml/kg)	32.00 \pm 0.58 ^c	31.00 \pm 0.58 ^{de}	37.00 \pm 0.58 ^c
	Synobiotic + hytobiotic (1 ml /Kg)	30.00 \pm 0.58 ^d	37.00 \pm 0.58 ^a	40.67 \pm 0.88 ^a
Vaccinated	Control (+ve)	34.00 \pm 0.58 ^b	35.00 \pm 0.58 ^{bc}	39.94 \pm 0.38 ^{ab}
	Synobiotic (1 ml/kg)	33.60 \pm 0.31 ^b	29.00 \pm 0.58 ^e	31.00 \pm 0.58 ^e
	Phytobiotic (1 ml/kg)	33.67 \pm 0.33 ^b	33.44 \pm 0.32 ^d	33.31 \pm 0.35 ^d
	Synobiotic + hytobiotic (1 ml /Kg)	33.22 \pm 0.37 ^{bc}	34.00 \pm 0.58 ^{cd}	34.67 \pm 0.33 ^d

a, b & c: There is no significant difference ($P>0.05$) between any two means, within the same column have the same superscript letter.

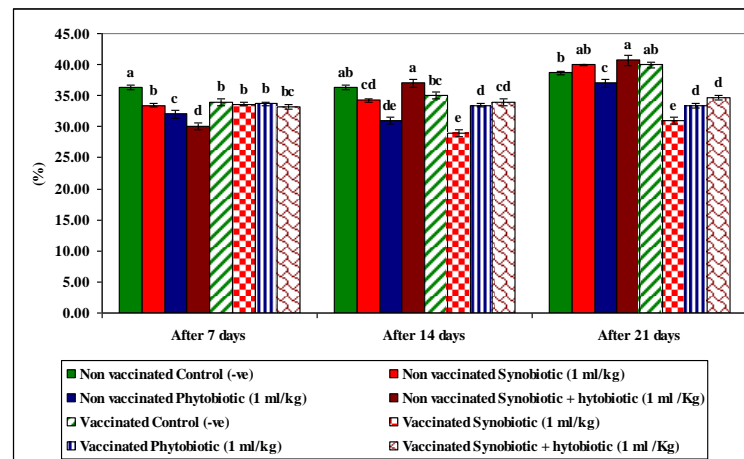


Fig. 5: HCT.

4.2.4. The effect on MCV

Table (6) and figure (6) showed the administration synbiotic and phybiotic and mixture of them in non vaccinated and vaccinated chicken. The dose of administration of synbiotic and phybiotic (1ml/kg body weight) orally for 3 days showed significant decrease in MCV level at (7 day,14 day) in unvaccinated and vaccinated chicken. The same trend was observed with phytobiotic. The excessive decrease was shown with mixture of them at 7 and 14 day in unvaccinated chicken compared to control group. Mixture of synbiotic and phytobiotic gave slight increase of MCV level in vaccinated chicken during 14 and 21 day compared to control group.

Table 6: MCV (Fl) (Mean±SE)

Groups		Period after (days)		
		7	14	21
Non vaccinated	Control (-ve)	180.67±0.58 ^a	180.07±0.07 ^a	111.71±0.20 ^e
	Synbiotic (1 ml/kg)	134.16±0.56 ^d	112.22±0.45 ^d	143.61±0.33 ^a
	Phytobiotic (1 ml/kg)	115.57±0.40 ^e	100.64±0.41 ^f	127.85±0.15 ^c
	Synbiotic + hytobiotic (1 ml /Kg)	99.00±0.58 ^b	178.33±0.57 ^b	110.60±0.25 ^f
	Control (+ve)	157.41±0.41 ^b	112.55±0.40 ^d	126.02±0.17 ^d
	Synbiotic (1 ml/kg)	106.44±0.46 ^e	107.22±0.51 ^e	126.21±0.25 ^d
Vaccinated	Phytobiotic (1 ml/kg)	142.65±0.63 ^c	112.39±0.60 ^d	110.69±0.45 ^f
	Synbiotic + hytobiotic (1 ml /Kg)	110.23±0.13 ^f	122.26±0.44 ^c	129.55±0.29 ^b

a, b & c: There is no significant difference ($P>0.05$) between any two means, within the same column have the same superscript letter.

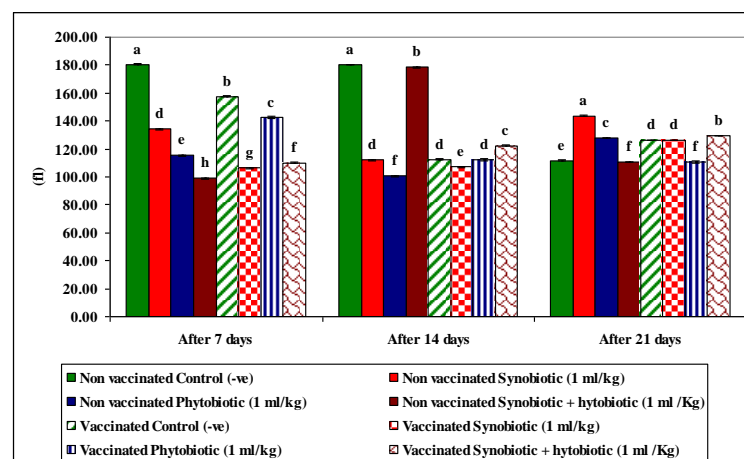


Fig. 6: MCV.

4.2.5. The effect on WBC

Administration of synbiotic and phybiotic and mixture of them in non vaccinated and vaccinated chicken are shown in Table (7) and figure (7). The dose of administration of synbiotic (1ml/kg body weight) orally for 3 days showed significant increase in WBC level at 7 and 21 day and significant decrease at 14 day. Administration phytobiotic (1ml/kg body weight) showed significant decrease of WBC level at (7 day and 14 day) and significant increase in WBC level at 21day in unvaccinated chicken. WBC level in vaccinated chicken appeared to significant decrease at (7 day,21day), while it showed higher significant at 14 day compared to control group. WBC level with mixture of synbiotic and phytobiotic with unvaccinatedchicken showed increase level at all periods, while it was significant higher at 14 day with vaccinated.

Table 7: Wbcs (X103) (Mean±SE)

Groups	Period after (days)			
	7	14	21	
Non vaccinated	Control (-ve)	76.50±0.60 ^b	70.96±0.06 ^a	66.36±0.15 ^e
	Synbiotic (1 ml/kg)	85.64±0.24 ^a	65.76±0.34 ^b	69.04±0.09 ^{de}
	Phytobiotic (1 ml/kg)	68.53±0.42 ^c	61.33±0.33 ^c	71.00±0.58 ^{cd}
	Synbiotic + hytobiotic (1 ml /Kg)	77.47±0.35 ^b	71.44±0.50 ^a	82.04±0.10 ^b
	Control (+ve)	70.33±0.33 ^c	55.43±0.48 ^d	87.00±0.58 ^a
Vaccinated	Synbiotic (1 ml/kg)	75.37±0.32 ^b	47.67±0.62 ^e	88.31±0.26 ^a
	Phytobiotic (1 ml/kg)	68.36±0.38 ^c	70.67±0.88 ^a	82.00±0.58 ^b
	Synbiotic + hytobiotic (1 ml /Kg)	59.21±3.41 ^d	67.21±0.44 ^b	74.06±3.04 ^e
	Control (+ve)			

a, b & c: There is no significant difference (P>0.05) between any two means, within the same column have the same superscript letter.

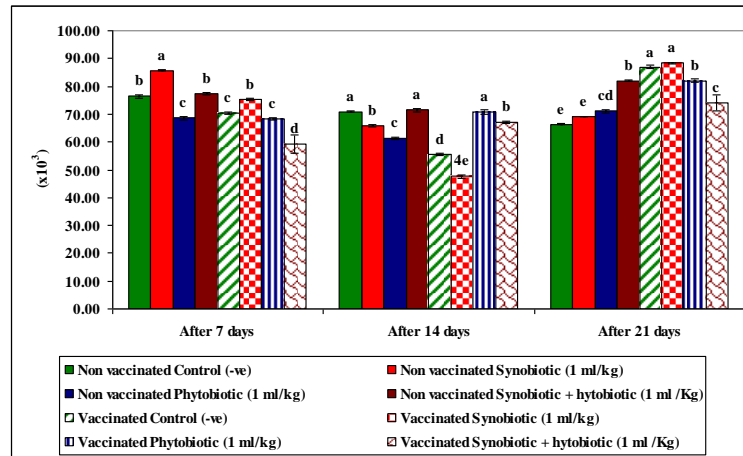


Fig. 7: WBCs.

4.3. Histological studies

Microscopic examination of different sections were taken from specimens of kidney. showing normal renal tubules, glomeruli with mild congestion of renal blood vessels figure (9), revealing moderate improvement in histological structure of renal tissue figure (10), showing moderate improvement of kidney lesion figure (11), mild improvement in histological appearance of renal tissue figure (12), showing marked improvement in pathological lesion, except congestion of some renal vessels figure (13).

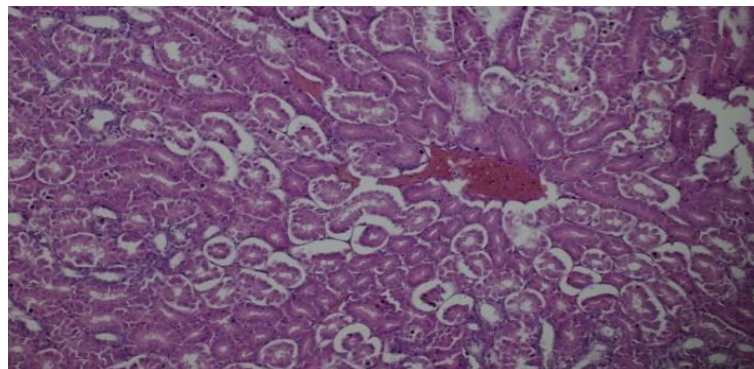


Fig. 9: Showing Normal Renal Tubules, Glomeruli with Mild Congestion of Renal Blood Vessels.

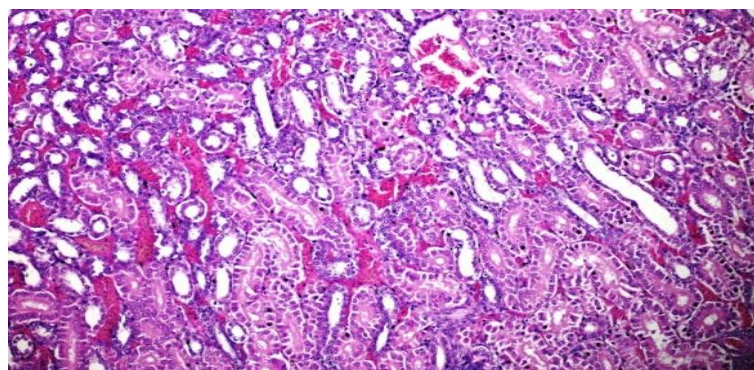


Fig. 10: Showing Moderate Improvement in Histological Structure of Renal Tissue.

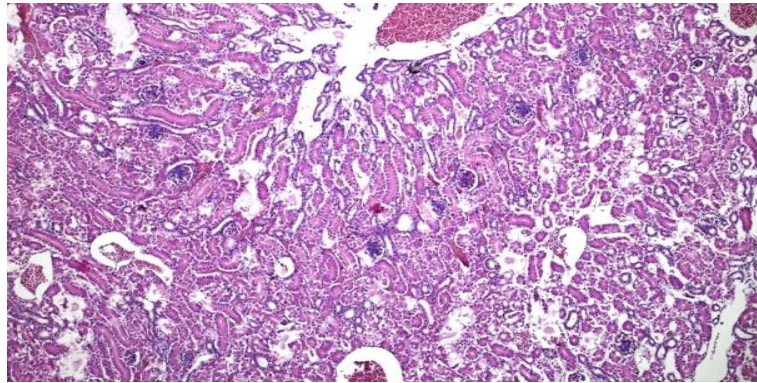


Fig. 11: Showing Moderate Improvement of Kidney Lesion.

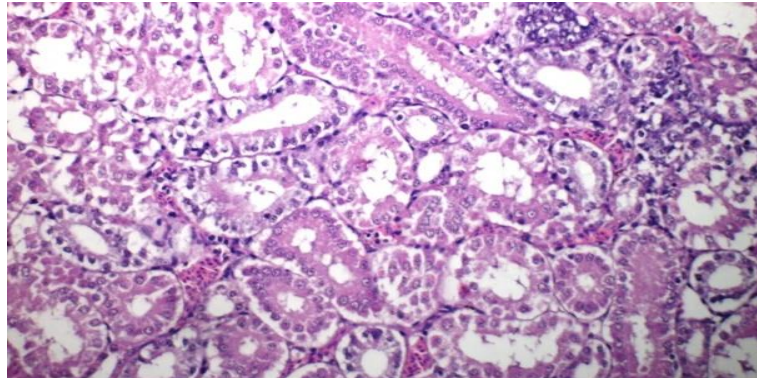


Fig. 12: Revealing Mild Improvement in Histological Appearance of Renal Tissue .

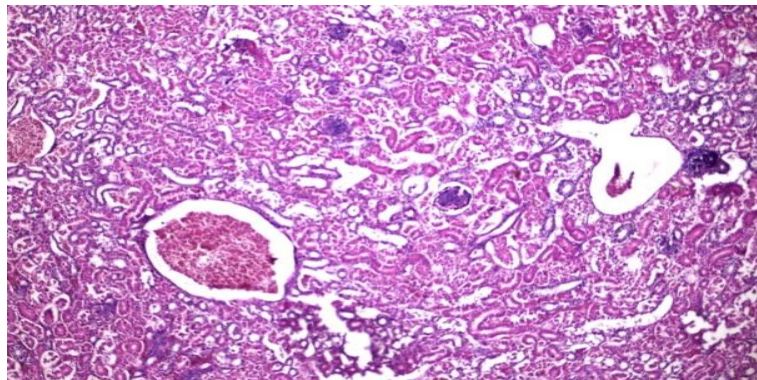


Fig. 13: Showing Marked Improvement in Pathological Lesion, Except Congestion of Some Renal Vessels.

5. Discussion

Feed additives include feeding attractants, immunostimulants, prebiotics, probiotics, acidifiers, essential oils, or other inclusions. These additives are usually not required nutrients. Feed attractants enhance the ingestion of feeds. Ashayerizadeh et al (2011) studied the paper effect of dietary supplementation as probiotic and prebiotic on growth indices and serum biochemical parameters of broiler chickens. Synbiotic Is defined as a mixture of probiotic and prebiotic that beneficially affect the host by improving the survival and activity of beneficial microorganisms in the gut.(Awad et al.; 2008).

Phytobiotic is aphytogenic as feed additive (a mixture of essential oils with thymol and anethole) affected the growth performance, some blood parameters and jejunal morphology in broiler chickens. Aromatic plants, also known as herbs and spices, have been used since antiquity as folk medicine and as preservatives in foods (Amad et al, 2011).

In order to achieve better results for broilers chicken, various additives can be added to feed, including phytobiotics (phytogenic additives). Phytobiotics protect young broilers' health based on the principles of competitive exclusion and improved usability of nutrients, growth and feed efficiency. Sobayo et al, (2013) studied haematological, serum and carcass characteristics of broiler chicken fed graded levels of *Garcinia kola* (Bitter kola) used as phytobiotic. On the other hand, Sanja et al (2015) studied the effect of synbiotic on growth and antioxidant status of blood in broiler chicken.

kidney is an important organ having not only excretory function but also other functions such as production of the substances that activates a living body, enzymatic reaction, immunization. The kidney is often involved in the development, maintenance and counter regulation of complex electrolyte disturbances (Heidland et al., 1985).

Uric acid is the primary catabolic product of protein, non protein nitrogen and purines in birds. Birds are uricoletic and produce uric acid not urea as the major nitrogenous end product of metabolism, so blood urea is not effective in renal function test (Harrison and Harrison 1986). Creatinine not a major non protein nitrogen component in avian blood formed during muscle metabolism of creatinine and phosphor creatine and excreted by glomerular filtration. .

In our study there were a significant decrease in uric acid and creatinine level at (7day ,14day and 21day) in unvaccinated and vaccinated chicken. The results were agreement with those reported by Mehr et al., (2014) who observed that the addition of various concentrations

of clove essential oil, as a natural growth promoter and probiotic resulted in uric acid was significantly decreased in group treated with probiotic. The results were coordinates with that of Abdelrafea et al., (2013). They showed that the addition of Astragalus membranaceus root powder to broiler diets significantly decreased serum creatinine enzymes. Furthermore Erdogan et al.,(2010) studied the effectiveness of phytobiotic as feed supplementation on broilers growth performance, level of creatinine and uric acid in broiler chicken resulted in significant improvement of kidney functions .

Mixture of synbiotic and phytobiotic showed excessive increase in Hb level with both unvaccinated and vaccinated chicken during all periods. Data were agreement with Jagmohan Singh et al., (2013) who evaluated the effects of Aloe vera on dressing percentage ,hematological and biochemical parameters of broiler chickens, showed significantly higher value of hemoglobin concentration ,also these results also agreement with Sobayo et al.,(2013) who studied haematological, serum and carcass characteristics of broiler chicken fed `graded levels of garcinia kola. Beski et al., (2015) reported that effects of dietary supplementation of probiotic and synbiotic on broiler chickens resulted in a significant increase in the concentration of Hb. Furthermore, results of Syed Muddassar et al.,(2018) were agreement with the finding of present result. Also, the results were coordinates with that of Fasanmi et al., (2014).

WBC level with mixture of synbiotic and phytobiotic with unvaccinated chicken showed increase level at all periods. These results were agreement with those obtained by Miraghaee et al., (2011) who showed that the addition of Echinacea purpurea Moench extract as feed additive increased white blood count significantly.

6. Conclusion

The present study by adminstration of synbiotic and phytobiotic or their mixture lead to significant improvement of growth performance and kidney functions of broiler chicken. Moreover, some mesurments of blood parameters and histological studies were at the normal range with no adverse effects.

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