

Field Trial For Treatment Of Coccidiosis In Goat Kids In Sharkia Governorate

Amina El Sayed Faris*, Eman A Ahmed**, Nesreen A Shawky*
and Fagr A Mahoud,**

Biochemistry* Department, Animal Health Research Institute (Zagazig branch)

**Department of Medicine and Pharmacology, Vet. Teaching Hospital of Fac. of Vet. Med. Zag.Univ.

ABSTRACT

The objective of this study was designed to clarify the effect of kid coccidiosis on some haematological and biochemical parameters, as well as to evaluate the effect of toltrazuril on its treatment. Fifteen kids were used in this investigation, (5 healthy and 10 diarrheic from coccidiosis), aged 1-1.5 month old weighting 8-10kg, belonged to a private farm at Sharkia Governorate. Kids were divided into three equal groups (5 kids each), The 1st group was clinically healthy kids free from internal and external parasite used as control group, 2nd group suffered from diarrhea due to coccidiosis and left without treatment, 3rd group suffering from diarrhoea due to coccidiosis and treated with toltrazuril in a dose of 25mg/kg b.wt./day for 3 consecutive days. Fecal samples were collected during treatment and on 1st, 5th and 10th days post treatment for examined for oocyst *Eimeria* spp. Also two blood samples were taken from all kids at 5st, 10th and 15th days of study for haematological and biochemical analysis.

Clinical signs of coccidiosis in kids were inappetance, diarrhea, dehydration, emaciation, weakness, tenesmus and anemia beside depression, straining and normal rectal temperature. Toltrazuril reduced oocyst to 0% at 1st days post treatment.

Coccidiosis induces significant increase in total erythrocytic count hemo-globin %, packed cell volume and insignificantly decrease in total leukocytes count. Serum analysis of diseased kids revealed decreased total protein, albumin, glucose, copper, zinc, iron but globulin and A/G ratio insignificantly decreased, liver enzymes (AST, ALT & alkaline phosphatase, urea and creatinine were elevated in comparison with the clinically normal kids. All haematological and biochemical parameters were returned to the normal levels after treatment by toltrazuril.

It could be concluded that coccidiosis infestation induce haematological and biochemical changes which returned to the normal levels and reduced oocyst *Eimeria* spp. to 0% at 1st days post treatment by toltrazuril.

INTRODUCTION

During the first few months of life, diseases that affected young domestic animals causes great losses of animal industry, that is because the immune system of animals at young age is not well developed and the maternal immunity would not withstand variable infections (1). Neonatal diarrhoea is an important cause of death and considered to be one of the main hazards to lambs and kids health (2). Diarrhoea is a symptom caused by different agents of different natures with high incidence of mixed infection. The proposed causes of diarrhoea in

new born kids are many and unrelated, including bacteria viruses, protozoa, and environmental factors (3).

Parasitic infestations are a major constraint for the small ruminant production in tropics and subtropics by causing morbidity, mortality and production losses (4). Coccidiosis is a worldwide contagious disease of sheep and goats, especially the young lambs and kids. The intensity of the parasitic infection in small ruminants is correlated with the general health status (5). Coccidiosis is a protozoal disease that affects several animal species including goats (6). The

etiological agents are *Eimeria* spp. and their oocysts shed in the faeces of clinically affected animals (7, 8). Ingestion of contaminated feed and water play a role in development of coccidiosis (9).

Anticoccidial drugs have been widely used to minimize losses caused by the disease (10). Ideal anticoccidial should limit the number of coccidian that complete their life cycles (11, 12). Toltrazuril is a triazinone drug has broad spectrum anticoccidial and antiprotozoal activity (13). In addition it is active against both sexual stages of coccidia by inhibiting nuclear division of schizonts and macrogamete and the wall forming bodies of macrogametes (14).

The present study focused on evaluation of the efficacy toltrazuril as anticoccidial drugs in kids naturally infested with coccidiosis, studying the haematological as well as biochemical parameters in serum of infested and treated kids.

MATERIAL AND METHODS

Drug:- Toltrazuril (Baycox)[®] was obtained from Bayer company. 25 mg/kg B.WT/day for 3 days /kids infested with coccidiosis

Animals

Fifteen kids of native breed aged 1-1.5 month old and 8 – 10 kg body weight (5 healthy and 10 diarrheic from coccidiosis) at a private farm at Sharkia Governorate were used in this investigation. All animals were fed on barseem, dry ration and water *ad-libitum*. Kids suffered coccidiosis showed inappetance, weakness and diarrhea, beside depression, straining and normal rectal temperature.

3) Experimental design

Goat's Kids in this study were divided into three groups five in each. 1st group was clinically healthy kids free from internal and external parasite (has been proved by clinical and fecal examination) was used as control group, 2nd group kids suffered from diarrhea due to coccidiosis and left without treatment, 3rd group kids suffered from diarrhea due to coccidiosis

and treated with toltrazuril in a dose of 25mg/kg B.wt./day for 3 consecutive days.

Sampling

A) Faecal samples

Individual faecal samples were collected from all kids during treatment and at 1st, 5th and 10th days post treatment using probes introduced into the rectum of kid and kept in sterile plastic bottles for parasitological examination using centrifugal floatation technique for the detection of oocysts (15).

B) Blood samples.

Two blood samples were collected from control and infested kids before and 5th, 10th and 15th days post treatment. 1st sample was collected in tube contain EDTA for hematological study (16). 2nd sample was collected in centrifuge tube to obtain clear serum for determination of transaminases (AST-ALT) calorimetrically (17) alkaline phosphatase (18), total protein (19) albumin (20) globulin was calculated as difference between total protein and albumin, glucose (21). Serum urea (22) creatinine (23), calcium (24), inorganic phosphorus (25) copper (26), iron (27) and zinc (28).

C) Statistical analysis

The obtained results were statistically analyzed (29).

RESULTS

Clinical signs of coccidiosis in kids were inappetance, diarrhea, dehydration, weight loss, weakness and tenesmus beside depression, straining and normal rectal temperature Improvement of clinical signs were observed post treatment of infested kids by toltrazuril and reduced oocyst *Eimeria* spp. to 0% on 1st days post treatment. (Table 1).

Coccidiosis in kid induces significant increase in erythrocytic count hemoglobin %, packed cell volume, and insignificantly decrease in total leukocytes count (Table 2).

Analysis of blood parameters revealed that infested kids show lower levels of serum total protein, albumin, glucose, copper, zinc, iron and insignificant decrease on globulin and A/G ratio. Liver enzymes transaminases (AST-ALT), alkaline phosphates phosphatase, urea and

creatinine were elevated in comparison with the clinically normal kids (Tables 3- 5).

All haematological and biochemical Parameters were returned to the normal levels at 10 day post treatment of diseased kids by toltrazuril in therapeutic dose.

Table 1. Efficacy of toltrazuril (25mg/kg b.wt./day for 3 day)in kids infested with coccidiosis

Group	Oocyst /Filed					
	Days during- treatment			Days post end of treatment		
	1 st	2 nd	3 rd	1 st	5 th	10 th
Diseased kid non treated	22.49±0.41	19.28±0.19	23.31±0.64	18.83±0.49	15.35±0.74	19.05±0.89
Treated kids	14.71±0.64**	3.71±0.42***	1.05±0.09***	000	00	00

Table 2. Haemogram of the healthy and diseased kids (n=5)

Group		RBCs (106/c.mm)	H.B (g m %)	P.C.V. (%)	WBCs (103/cmm)	
Healthy kid (control)		9.75±0.92	13.12±0.27	40.31±1.04	9.16±0.41	
Diseased kid		12.28±0.43**	15.2±0.88**	45±0.46**	8.12±0.98	
Treated kid	Day PT	5	11.09±0.25*	14.89±0.22*	43.7±0.36*	8.67±0.83
		10	10.13±0.57	12.23±0.56	42.1±1.26	8.92±0.51
		15	9.39±0.59	13.09±0.23	41.03±1.28	9.05±0.38

* Significant at P < 0.05 ** significant at P < 0.01

Table 3. Protein profile and glucose of the healthy and diseased kids. (n=5)

Group		Protein profile(gm/dl)				Glucose (mg/dl)	
		T. protien	Albumin	Globulin	AG ratio		
Healthy kid		8.30±0.40	4.70±0.32	3.60±0.15	1.31±0.21	68.31±2.01	
Diseased kid		6.30±0.34*	3.23±0.14*	3.07±0.58	1.05±0.29	53.38±2.15**	
Treated kid	days PT	5	6.76±0.14*	3.68±0.09*	3.08±0.42	1.19±0.22	58.27±2.42*
		10	7.12±0.61	3.92±0.41	3.20±0.53	1.23±0.19	62.02±4.03
		15	8.21±0.65	3.85±0.27	4.36±0.27	0.88±0.20	66.29±2.38

* Significant at P < 0.05 ** significant at P < 0.01

Table 4. Trace mineral of healthy and diseased kids (n = 5)

Group		Calcium (mg%)	Phosphorus (mg%)	Copper (mg%)	Zinc (mg%)	Iron (ug/dl)
Healthy kid		9.12±0.69	4.13±0.21	98.36±3.74	92.18±2.82	107.26±3.51
Diseased kid		6.59±0.49*	3.05±0.09*	86.2±3.18*	81.21±3.13*	96.38±2.31*
Treated kid	days PT	5	7.06±0.12*	3.41±0.14*	91.1±3.01*	86.03±1.18*
		10	8.79±0.88	3.97±0.41	96.17±4.28	89.39±2.98
		15	9.04±0.92	4.05±0.38	97.73±2.21	91.36±2.39

*Significant at P < 0.05

Table 5. Liver enzymes and kidney function of the healthy and diseased kids (n = 5)

Group		Liver enzymes			Kidney function	
		AST (U/L)	ALT (U/L)	ALP (I.U/ml)	Urea (mg/dl)	Creatinine. (mg/dl)
Healthy kid		42.08±1.28	18.38±1.19	79.12±2.19	19.38±1.03	1.51±0.18
Diseased kid		53.4±1.3**	27.3±1.2**	88.31±1.5**	25.95±1.13*	2.46±0.09**
Treated kid	day PT	5	48.3±1.25*	25.1±1.46*	85.24±2.25*	23.64±1.05*
		10	44.18±1.25	22.51±1.94	80.18±3.89	20.04±1.01
		15	41.96±1.93	19.46±1.89	79.89±2.49	19.89±1.94

* Significant at P < 0.05 ** significant at P < 0.01

DISCUSSION

Newly born animals were reliable to suffer severely from a variety of enteric disease due to viral, bacterial, parasitic, nutritional and hygienic condition because, they transferred suddenly from sterile intrauterine life to an extra uterine with surrounding environments rich in various pollutants which decrease their general body resistance rendering them susceptible to severe disease (30).

Clinical signs of coccidiosis in examined kids were inappetance, weakness, diarrhea, dehydration, weight loss, tenesmus and anemia beside depression, straining and normal rectal temperature. These signs were recorded previously (31) showing that coccidiosis in goats induce diarrhea inappetance, weakness, depression and straining. Also, kids suffered from coccidiosis showed clinical signs represented by diarrhea (watery faeces often

contain mucous materials) dysentery, tenesmus, weakens, weight losses, serous discharge from the nose and eyes pulse, respiratory rate and rectal temperature within normal levels(32). Coccidiosis in sheep induce retarded growth and anemia (33). It has been also recorded that coccidiosis in lambs caused enteritis with greenish yellow watery or bloody diarrhea of offensive odor, besides weakness and moderate dehydration (34). This clinical symptoms disappeared at 1st day post treatment kids with toltrazuril for 3 day. Our results were supported previous study in goats (32).

Parasitological examination of fecal sample of kids suffering from coccidiosis under microscope revealed presence of different oocyst (Table 1). These results are in agreement with those previously recorded (31) in goats and treatment naturally infested kids with toltrazuril induce reduction of oocyst *Eimeria* spp. during treatment and Complete disappearance of the

oocysts was observed at 1st day post treatment. Kids infested with coccidiosis and treated with toltrazuril in therapeutic dose for two day showed disappeared oocyst at 1st day post treatment and induce an 100% efficacy of at 1st days post treatment (32).

Hematological results of coccidiosis in kids revealed significant increase in total erythrocytic count hemoglobin %, packed cell volume % and insignificantly decrease in total leukocytes count. Similar results were recorded (35) which indicated that coccidiosis in kids induce significant elevation in the total erythrocytic count, hemoglobin content, packed cell volume and insignificant decreases in the total leukocytic count. Coccidiosis induce elevation in total erythrocytic count hemoglobin % (6). The elevation in total erythrocytic count, haemoglobin content and packed cell volume in kids suffered from coccidiosis may be attributed to the excessive loss in body fluids due to diarrhea and hemoconcentration (36). Diarrhea due to coccidiosis induce dehydration and hemoconcentration which could be attributed to the loss of body fluids (32).

Analysis of blood serum constituents revealed hypoproteinemia associated with hypoalbuminemia and insignificant decrease in globulin and A/G ratio in kids suffered from coccidiosis. The obtained data are in accordance with those previously cited (5,37) in lambs suffered from coccidiosis. The change in protein picture in our study can be attributed to inability of the gut in the parasitized lambs to absorb and assimilate the haemopoietic elements required for the blood serum total protein, albumin and globulin (38) and albumin may be lost with the inflammatory exudate of the damaged tissue (39). A significant decline in glucose was observed in kids suffering from coccidiosis if compared with healthy ones. Low blood glucose in the infected kids were possibly due to state of anorexia, decreased intestinal glucose absorption, and the low glucose reserve in the young age (40, 41).

It is clear from Table 4 that significant decrease in the level of calcium, phosphorus, copper, zinc, iron in kids suffered from diarrhea due to coccidiosis were found if compared with

clinically healthy ones. The obtained results are in accordance to those previously obtained in lambs infested with coccidiosis (42). The reduction in these minerals (calcium, phosphorus, copper, zinc, iron) in kids suffered from diarrhea due to coccidiosis may be due to that the *Eimeria* spp. multiply in the intestinal tract they cause tissue damage resulting in interruption of feeding and digestion processes besides nutrient absorption, dehydration, blood loss and increased susceptibility to other disease agents (10).

It is evident from the present study that coccidiosis in kids induce a significant increase in serum AST-ALT, alkaline phosphatase, urea and creatinine. These results came in the same line with that noticed in kids suffered from coccidiosis (32). Changes in liver enzyme activity due to coccidiosis could be attributed to the epithelial tissues damage of the intestinal walls by the parasites and its toxins (43). Significant elevation in serum urea and creatinine in kids suffered from coccidiosis in our results was recorded of diarrhoic sheep due to coccidiosis infections (9).

All above biochemical parameters returned to the normal level after treatment by toltrazuril.

It could be concluded that coccidiosis infestation induce haematological and biochemical changes which returned to the normal after treatment by toltrazuril in which reduced oocyst *Eimeria* spp. to 0% at 1st days end treatment.

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الملخص العربي

محاولة حقن لعلج الإصابة بالكوكسيديا في الجديان بمحافظة الشرقية

أمينة السيد فارس* إيمان عبد الحميد أحمد**، نسرين أحمد شوقي*، فجر عبد الكريم محمود**

أقسام الكيمياء* معهد بحوث صحة الحيوان بالقازيق

وكلية الطب البيطري جامعة الزقازيق**

يعتبر التولترازيورل من المركبات المهمة في علاج الكوكسيديا ولقد استهدفت هذه الدراسة استبيان المزيد من المعلومات عن كفاءة عقار التولترازيورل في علاج الجديان المصابة بالكوكسيديا واستبيان بعض التغيرات في صورة الدم وبعض الوظائف البيوكيميائية المصاحبة للإصابة بالكوكسيديا في الجديان. تم إجراء هذه الدراسة على عدد ١٥ من الجديان عمر ١ - ١,٥ شهر بإحدى المزارع الخاصة بمحافظة الشرقية. تم تقسيم هذه الجديان إلى ثلاث مجموعات كل مجموعة منهما تحتوي على عدد ٥ جدي المجموعة الأولى منها بصحة جيدة خالية من الطفيليات الداخلية والخارجية مجموعة محكمة والمجموعة الثانية جديان مصابة إصابة طبيعية بالكوكسيديا ولم يتم علاجها. المجموعة الثالثة جديان مصابة إصابة طبيعية بالكوكسيديا ويتم

علاجها باستخدام التولترازيورل (٢٥مجم/كجم من وزن الجسم) لمدة ٣ يوم متتالية. تم تجميع عينات براز من كل جدى قيل واثناء العلاج وعند ١, ٥, و ١٠ يوم بعد نهاية العلاج وذلك للفحص الباراسيتولوجى وذلك لحساب عدد oocyst فى كل عينة براز وكذلك تم أخذ عينتين دم من كل جدى قبل العلاج وبعده ١٠, ٥, ١٥, يوم, الأولى على EDTA وذلك لدراسة تأثير الكوكسيديا والعلاج على صورة الدم والأخرى لفصل المصل وذلك لقياس بعض الوظائف البيوكيميائية

بدراسة كفاءة التولترازيورل في علاج الكوكسيديا فى الجديان حيث وجد أنه له تأثير قوى وادى الى اختفاء oocyst عند اليوم الاول بعد نهاية العلاج.

تشير النتائج أن الإصابة بالكوكسيديا أدت الى حدوث زيادة معنوية فى عدد كرات الدم الحمراء, تركيز الهيموجلوبين , حجم خلايا الدم المرصوفة ونقص غير معنوى فى عدد كرات الدم البيضاء.

وبدراسة التغيرات البيوكيميائية التى حدثت نتيجة الإصابة بالكوكسيديا وجد نقص معنوى فى البروتين الكلى , الالبومين, الجليكوز, الكالسيوم, الفسفور, النحاس, الزنك والحديد ونقص غير معنوى فى الجلوبيولين والنسبة بين الزلال والجلوبيولين. حدوث زيادة معنوية فى الترانس أمينيزسس (AST- ALT) والفوسفاتيز القاعدي اليوريا والكرياتينين

و تلاحظ أن استخدام التولترازيورل ادى إلى عودة هذه الوظائف إلى المستوى الطبيعى في مصل الجديان المصابة والمعالجة .

نستخلص من هذه الدراسة أن الكوكسيديا احدثت بعض الآثار العكسية على صورة الدم وبعض القياسات البيوكيميائية فى الجديان ولكن استخدام التولترازيورل فى علاج الكوكسيديا أدى إلى تحسن الحالة الصحية للجديان وعادت تلك الوظائف إلى وضعها الطبيعى بعد العلاج ب ١٠ يوم .