STUDIES ON CLINICAL SIGNS, HEMATOLOGICAL AND BIOCHEMICAL ALTERATIONS DUE TO TREATMENT OF PROTOZOAL DIARRHEA IN NEWLY BORN CAMELS

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Abstract

This study was planed to investigate the effect of cryptosporidiosis and coccidiosis in hemato- biochemical alterations beside effect of diclazuril and sulphamix on treatment. A total of 70 fecal samples were collected from 70 camel calves aged from 3-5 week (5 healthy and 65 suffering from diarrhoea) from different localities in Sharkia Province. Fecal samples were parasitologically examined for isolation and identification of protozoal causes of diarrhoea. Post parasitological examination 20 camel calves were divided into 4 equal groups (5 in each), 1st group healthy camels calves(control group), 2nd group camels calves suffering from coccidiosis treated with diclazuril and Rehydro–Zinc for 5 successive days. 3rd group camel calves suffering from cryptosporidiosis treated with sulphamix and Rehydro–Zinc and 4th group camel calves suffering from mixed infestation (cryptosporidiosis and coccidiosis) treated with diclazuril and sulphamix beside Rehydro–Zinc for 5 successive days. Individual fecal samples were collected pre, 1st, 5th, 7th and 10th days post treatment from all camels calves for parasitological examination. Two blood samples were collected from all camel calves pre- treatment, 1st and 10th days post treatment for hemato-biochemical study

Parasitological examination of fecal samples revealed 18 (27.69%) samples were free from protozoa beside 47(72.31%) were positive samples for protozoa (coccidiosis and cryptosporidium) distributed as 25(53.19%) positive for coccidian infection[single infection, E.cameli,10(40%), E. dromedarii,7(28%) and mixed infection (E. cameli with E. dromedarii, 8(32%)]. Cryptosporidialmuris was detected in 12 (25.53%) and mixed infection (cryptosporidium + coccidiosis) 10(21.28%).

Infected camel calves with coccidiosis and cryptosporidium showed clinical signs as weakness, offood, diarrhea, depression, rectal straining and normal rectal temperature. Diclazuril and sulphamix lead to reduce cryptosporidial and coccidian oocyte count to100% at 7th and 10th days post treatment respectively.

Coccidiosis and cryptosporidiosis induce significant ($P < 0.05$) elevation in RBCs ,Hb, PCV%, AST, ALT, ALP, urea, creatinine and significant ($P < 0.05$) decrease in total protein, albumin, globulin, sodium, potassium, calcium, phosphorus.

Treatment camel calves suffering from coccidiosis and cryptosporidiosis with diclazuril and sulphamix evoked disappear clinical signs, decrease in faecaloocysts output and improvement in hemato-biochemical parameters were observed.

It has been concluded that, coccidiosis and cryptosporidiosis in camel calves induce adverse effect in hemato-biochemical parameters. Diclazuriland sulphamix led to disappear clinical signs and improved haemato-biochemical parameters.

Keywords : camel cryptosporidiosis, camel coccidiosis, diclazuril, sulphamix .

INTRODUCTION

Camels (Camelusdromedarius) play an important role in economy and social life of a large sector of pastoralists in arid and semiarid regions (Osman and Busadah, 2000). Camels are an economic feader which is a source of meat, wool, hair and hids (Abou-Eleil, 2003). In the world, there are about 18 million camels (14 in Africa and 4 in Asia).

Parasitic infestation is a major constraint in ruminant in tropic and subtropic areas (Babcock and Cushing 2004). Coccidiosis is world wide disease caused by different spp. of Eimeria protozoa (Ozmen, et.al 2004). Coccidiosis causes mortality rate up to 10% in young camels (Kinne and Warnery,1997) especially during first months of life (Pugh 2002). Genus Eimeria cause watery to bloody diarrhoea in many vertebrates (Svensson 1993).

Cryptosporidiosis is a zoonotic disease affecting a wide range of vertebrate (Razawi, et.al. 2009). Cryptosporidium species is an enteric pathogen in animals (Janoff and Reller 1987), which is in phylum Apicomplexa and part of the group of parasites referred to as coccidian (Fayer,et.al.1997). Cryptosporidium may be associated with bacterial or viral pathogens or coccidiosis and these infect-ions are more severe than Cryptosporidiosis alone(Kirkpatrick , 1985), which is mostly seen in animals between few days up to one month of age (El-Gaml, et.al. 2001), where younger animals are severely be affected (Fayer, et.al. 1997).

Anticoccidial drugs have been widely used to minimize losses caused by the disease (Long, et. al.1979). Diclazuril is a chemical substance synthesized from benzene acetonitrile derivative as anticoccidial agent with high effeicacy against all Eimeria(Daugschies,et al.2007) as drinking medication (El-Banna ,et.al. 2004). Diclazuril interrupt the life cycle of parasite (Maes, et.al. 1989).

This study planned to investigate the effect of cryptosporidiosis and coccidiosis in hemato-biochemical parameters alterations and as well as the effect of diclazuril and sulphamix as a treatment of coccidiosis and cryptosporidium in camel calves.

MATERIALS AND METHODS

Drugs:

1- Diclazuril (Diclosol 1%)® it is a water soluble formulation obtained from PharmaSweed Company.

2- Sulphamix it is a trade name for a compound contains mixture of sulphadimidin sodium, sulphadiazine sodium and sulphathyazol sodium, produced by Pharma Swede Company-Egypt

3-Rehydro–Zinc is a trade name for electrolyte mixture produced as sachet and Manufactured by chemical industries development Co. (CID) A.R.E

Animals

A total of 70 camels (Camelusdromedarius) aged from 3-5 week (5 healthy and 65 suffering from diarrhoea) belonged to different localities in Sharkia Province were used in this trial. Faecal samples were collected from healthy and diarrh- oeic camels and transported to laboratory for parasitological examination.

Experimental designs

Post parasitological examination, 20 camels calves were divided into 4 equal groups (5 each),1stgroup. healthy camels calves(control group),2nd group camels calves suffering from coccidiosis treated with diclazuril(1mg/kg Bwt) (McDougald ,et.al.1990) and Rehydro–Zinc,(2 sachet /500 ml water as drench three time daily) orally for 5 successive days. 3rdgroup camels calves suffering from cryptosporidiosis treated with sulphamix (50 gm/camel calves) and Rehydro–Zinc (2 sachet/500ml) orally for 5 successive days and 4th group camels calves suffering from mixed infestation(coccidiosis +cryptosporidiosis) diclazuril and sulphamix treated and Rehydro–Zinc by same dose and period.

Sampling:-

Faecal samples:

Individual faecal samples were collected before and at1st, 5th,7th and 10th days post treatment from all examined camels calves using sterile probes introduced into the

rectum and kept in plastic bottles. All samples were labeled and sent to the laboratory for **parasitological examination through:-**

a- Direct faecal smear (Soulsby, 1986).

b- Concentration flotation technique (Levine, 1987).

C-Faecal smears were made and left to dry, then fixed with methanol for 10 minutes, and stained with modified Ziehl-Neelsen stain according to Henriksen and Pohlenz (1981). Finally; the smears were screened under the oil immersion lens for detection of cryptosporidialoocysts.

Blood samples

Two blood samples were collected from all camel calves before, 1stand 10th days post treatment, 1stsample was collected in tube contain EDTA for hematological study Jain,(1986) and 2nd sample was collected for obtain clear serum for estimation AST and ALT (Reitman and Frankel, 1957) alkaline phosphatase (John , 1982), total protein (Doumas,et. al. 1981) albumin Drupt, 1974) globulin was calculated as difference between total protein and albumin, urea(Patton and Crouch, 1977), creatinine (Henry1974) calcium (Gindler 1972) inorganic phosphorus (Goldenberg, 1966), sodium and potassium (Oser, 1979).

Statistical analysis: - Data were statistically analysed (Spsswin, 1995).

RESULTS AND DISCUSSION

Camel calves suffering from coccidiosis and cryptosporidiosis showed clinical signs represented by inappetance, weakness, diarrhea, depressed, present rectal straining and normal rectal temperature. Same clinical sign were recorded by Chineme (1980) and Boid, et. al (1986) in camel calves suffering from coccidiosis. Same clinical signs were observed by Soltane, et.al. (2007) and Fouda and Al Mujalii (2007) in camel-calves cryptosporidiosis.

Parasitological examination of diarrhoeic fecal samples revealed that 18 (27.69%) sample free from any protozoa beside positive sample for protozoa (coccidiosis and cryptosporidium) were 47(72.31%) distributed as 25(53.19%) positive for coccidian infection as single infection (E. cameli, 10 (40%), E. dromedarii, 7 (28%) and mixed infection(E. cameli with E. dromedarii, 8(32%), Cryptosporidialmuris 12(25.53%) and mixed infection (Cryptosporidiosis + coccidiosis)

10 (21.28 %). El Salahy and Arafa (2000) isolates E. dromedarii and E. cameli as single or mixed infection form camel calves in Assiut Province. Also, Mahran (2006) detect coccidian oocysts (E.cameli, 12.61% and E. dromedarii, 7.87%) from faecal sample of diarrhoeiccamels calves. Same results were recorded by Yakhchalim and Cheraghi (2007) stated that the prevalence of infection of camels calves with protozoan were 28.3% in Iran either in single or mixed infection. Yakhchalim and Moradi(2012) found that prevalence of Cryptosporidium infection in Iran was 10% but Ronald (1991) isolates Cryptosporidium muris from faecal sample of dromedary camels calves in percentage of 27%. Saleh and Mahran (2007) identify cryptosporidialmurisoocyst from diarrhoeiccamels calves in Shalatin.

The obtained data showed that diclazuril and sulphamix in used dose was effective aganistcoccidiosiss and cryptosporidiosis oocyst in which reduces oocyst count 100% at 10th and 7thdays post treatment respectively. Similar results were obtained by Zhou,et al.(2010) who mentioned that diclazuril highly effective against both asexual and sexual stages of the coccidiaoocyst leading to decrease oocyst output at 8th day post treatment and disappear of clinical signs. Our results were reinforced with that of Vanparijs, et.al. (1989) who found that diclazuril induce reduction in oocyst count and clinical sign post treatment. Ronald (1991) recorded that using sulphadimidin and sulphadiazine in treatment camel cryptosporidiosis leading to disapear Cryptosporidium murisoocyst output at 9th day post treatment. Same results were recorded by Byron, et.al. (2007) who mentioned that treatment cryptosporidiosis with sulphadmidine led to disappear Cryptosporidium oocyst.

The camels calves showed variations in blood picture including a significant increase in RBCs, Hb and PCV% in diarrhoic camels calves suffering from coccidiosis or crytosporidiosis either alone or together. These variations in erythrogram remained till the 10th day post treatment by diclazuril and sulphamixthen an improvement was seen on the 20th day post treatment. These results agreed with the results of Ashfaq (1991) found that coccidiosis in calves induce significant increase in RBCs count, Hb content and PCV%. Our results were supported by previous studies ofSayed, et.al (1998) who recorded that coccidiosis in camels calves induce significant increase in RBCs, Hb and PCV%, Also Ahmad (2002) mentioned that significant elevation in RBCs, Hb and PCV% was common feature in crytosporidia spp. diarrheic calves. The observed anemia in the infected camels may be due to excessive loss in body fluids and hemoconcentration as results of diarrhea (Jones and Hunt, 1983). Chhabra and Sangwan (2006) mentioned thatcoccidiosis induces dehydration and

hemoconcentration in camels calves. Crytosporidia adhere to microvillous border of enterocytes of small and large intestine causing diarrhea and hemoconcentration(Pohlenz et al 1978).

Analysis serum proteins of camel calves infected with cryptosporidiosis and coccidiosis revealed significant decrease in total proteins, albumin and globulin either alone or together. Our result was compatible with Sayed, et. al (1998) in camels calves coccidiosis and Saleh and Mahran (2007) in camel calves cryptosporidiosis. Decreased serum total protein may be due to a disturbed protein synthesis or due to anorexia which accompanied cryptosporidiosis and coccidiosis (Kaneko, 1989). Diarrhoea induced damage in intestinal tissue resulting in interruption of feeding and digestion processes or nutrient absorp- tion (Long,et al. 1979). Another explanation for decrease albumin come from Radostits, et.al(2002) mentioned that lowered serum total protein and albumin in camels coccidiosis and cryptosporidiosis may be due to inability of the gut in parasitized camels to absorb and assimilat the haemopoietic principals regarding blood serum total protein, albumin and globulin. Coles (1986) stated significant decrease albumin in cryptosporidiosis and coccidiosis in camel calves due to the state of aneroxia or inability of the liver to synthesis albumin.

The current study pointed out a significant increase in the serum AST, ALT and ALP in camel calves suffering from coccidiosis and cryptosporidiosis either alone or together. Same findings were recorded by Radostits, et.al (2002) who stated that coccidiosis induce significant increase in AST, ALT and ALP. Russel (2003) recorded that elevation liver enzymes in camel calves infected with coccidiosis may be due to epithelial tissues damage of the intestinal walls by the parasites and its toxins. Similar results were previously reported by Arafa, et.al. (2007) in sheep and goats, Kumar and Hafeez (1999) in calves coccidiosis and Omran, et.al (2005) in calves cryptosporidiosis.

It is evident from the present study coccidiosis and cryptosporidiosis in camel calves either alone or together induced significant elevation in urea and creatinine beside significant reduction in serum sodium, potassium, calcium and inorganic phosphorus. These results are similar to findings of Sayed, et al (1998) in camel calves suffering from coccidiosis and Saleh and Mahran (2007) in camels calves suffering from cryptosporidiosis. Our results are comparable with results of Blood and Radostitis (1989) who found reduction in phosphorous and magnesium in camel calves suffering from cryptosporidiosis and coccidiosis due to decrease in feed intake and mal absorption. Another explanation for reduction sodium, potassium, calcium

and inorganic phosphorus comes from Blaxter and wood(1953) who recorded that ,in diarrhoea there is increase in weight of faces up to 40% which is mainly due to increased execretion of water and this accompanied by considerable loss of sodium, potassium, calcium, inorganic phosphorus, magnesium.

In conclusion, dromedary camel calves were susceptible to cryptosporidial and coccidial infection with significant risk on their health. Diclazuril and sulphamix have important roles in disappear the oocyct from faecal sample and improved haemato-biochemical parameters.

Table 1. Parasitological examination of faecal samples of healthy and diarrheic camel

Type of samples	No. of examined samples	-ve samples		+ve samples for protozoa	
		No	%	No	%
Diseased camels	65	18	27.69	47	72.31
Healthy camels	5	5	100	-	-

Table 2. Prevalence of infestation of coccidiosis and Cryptosporidiosis in camel calves at Sharkia Province

No. of +ve samples	Prevalence of single and mixed infestation											
	Coccidia								Cryptosporidium		Mixed inf.	
	Total No.		single inf.				Mixed inf.		Cryptosporidium muris		Coccidia+ Cryptosporidium	
			E.cameli		E.dromedari		E.cam&dro					
	No	%	No	%	No	%	No	%	No	%	No	%
47	25	53.19	10	40	7	28	8	32	12	25.53	10	21.28

E=EimeriaInf= infestation Cryp= Cryptosporidium E.cam&dro. = E. cameli&E.dromedari

Table 3. Efficacy of diclazuril and sulphamix in camel calves infested with coccidiosis and cryptosporidiosis

No. of camels	coccidiosis (oocyct /Filed)					cryptosporidiosis (oocyct /Filed)				
	Pre treatment	Post treatment (days)				Pre treatment	Post treatment			
		1st	5th	7th	10th		1st	5th	7th	10th
1	18	9	4	1	0	15	8	3	0	0
2	13	6	2	0	0	9	5	2	0	0
3	15	8	4	2	0	10	4	0	0	0
4	21	9	5	3	0	12	6	2	0	0
5	14	4	1	0	0	8	3	0	0	0

Table 4. Blood picture of healthy and diseased camel calves (n=5)

Parameter	Healthy Camels (n=5)	coccidiosis			cryptosporidiosis			Mixed infestation		
		Pre treated	Post treatment		Pre treated	Post treatment		Pre treated	Post treatment	
			1st day	10thday		1stday	10thday		1stday	10thday
RBCs (106/µl)	7.38± 0.79	9.82± 0.47*	9.22± 0.23*	8.48± 0.71	9.27± 0.21*	9.14± 0.19*	7.90± 0.78	9.83± 0.53*	9.19± 0.16*	8.05± 0.89
Hb (gm/dl	11.92± 0.40	13.37± 0.31*	12.96± 0.21*	12.21± 0.80	13.60± 0.53*	12.98± 0.16*	11.41± 0.96	13.94± 0.66*	12.99± 0.20*	11.86± 0.92
PCV %	25.82± 1.04	32.18± 0.77**	30.02± 0.78*	26.63± 0.94	29.87± 0.85*	29.06± 0.61*	25.95± 0.90	29.96± 0.96*	29.08± 0.55*	25.75± 0.84

*Significant at P<0.05

Table 5. Serum protein picture of healthy and diseased camel calves (n=5)

Parameter	Healthy camels (n=5)	coccidiosis			cryptosporidiosis			Mixed infestation		
		Pre treatment	Post treatment		Pre treatment	Post treatment		Pre treatment	Post treatment	
			1stday	10thday		1stday	10thday		1stday	10thday
T.protein (g/dl)	7.57± 0.53	5.49± 0.47*	6.24± 0.25*	6.95± 0.59	5.20± 0.58*	5.40± 0.52*	7.32± 0.89	5.06± 0.66*	5.30± 0.60*	7.40± 0.47
Albumin (g/dl)	3.89± 0.49	2.23± 0.27*	2.79± 0.14*	3.43± 0.34	2.17± 0.29*	2.30± 0.21*	3.65± 0.82	2.05± 0.40*	2.35± 0.20*	3.69± 0.68
Globulin (g/dl)	3.68± 0.10	3.26± 0.15*	3.45± 0.02*	3.52± 0.15	3.03± 0.25*	3.10± 0.17*	3.67± 0.94	3.01± 0.21*	3.05± 0.25*	3.71± 0.49
A/G ratio	1.06± 0.25	0.68± 0.16	0.81± 0.21	0.97± 0.24	0.71± 0.12	0.74± 0.15	0.99± 0.23	0.68± 0.16	0.77± 0.14	0.98± 0.26

*Significant at P< 0.05

Table 6. Liver function of healthy and diseased camel calves (n=5)

Parameter	Healthy camels (n=5)	coccidiosis			cryptosporidiosis			Mixed infestation		
		Pre treated	Post treatment		Pre treated	Post treatment		Pre treated	Post treatment	
			1st day	10thday		1stday	10thday		1stday	10thday
AST (U/L)	24.18± 1.41	32.79± 1.51**	29.39± 1.63*	27.17± 1.93	31.27± 1.98*	30.71± 1.85*	25.14± 1.58	32.93± 2.43*	29.53± 1.48*	24.07± 1.80
ALT (U/L)	10.42± 1.08	17.72± 1.23**	15.17± 1.50*	12.05± 1.57	17.98± 2.09*	15.09± 1.43*	10.41± 1.24	18.59± 2.65*	16.15± 1.60*	10.27± 1.08
AlP (I.U/ml)	72.93± 1.12	80.20± 1.49**	77.39± 1.39*	74.03± 1.58	79.05± 1.80*	78.17± 1.46*	73.19± 1.89	80.09± 2.47*	79.21± 1.78*	71.98± 1.54

*Significant at P<0.05

Table 7. kidney function of healthy and diseased camel calves (n=5)

Parameter	Healthy camels (n=5)	coccidiosis			cryptosporidiosis			Mixed infestation		
		Pre treated	Post treatment		Pre treated	Post treatment		Pre treated	Post treatment	
			1st day	10th day		1stday	10thday		1stday	10thday
Urea (mg/dL)	25.83± 0.81	31.79± 1.94*	29.12± 0.73*	27.10± 0.79	30.85± 1.67*	28.27± 0.53*	25.16± 0.60	29.48± 1.06*	28.05± 0.35*	25.97± 0.94
Creat. (mg/dL)	1.41± 0.30	2.89± 0.50*	2.39± 0.21*	2.02± 0.41	2.70± 0.46*	2.64± 0.41*	1.50± 0.21	2.65± 0.33*	2.40± 0.22*	1.48± 0.25
Sodium mg/dl	127.25± 2.89	119.09± 2.48*	115.38± 2.94*	121.04± 2.91	117.12± 2.52*	120.8± 0.93*	125.03± 2.95	118.09± 2.35*	121.05± 0.38*	128.39± 2.48
Potassium (mg/dl)	4.74 ± 0.62	2.58± 0.55*	3.28± 0.20*	3.97± 0.65	2.70± 0.63*	2.97± 0.43*	4.13± 0.70	2.86± 0.50*	3.30± 0.17*	4.90± 0.89
Calcium (mg/dl)	9.15± 0.82	6.39± 0.32*	7.33± 0.14*	8.34± 0.39	6.08± 0.69*	6.79± 0.57*	8.89± 0.83	6.17± 0.55*	6.97± 0.45*	9.59± 0.99
Phosphorus (mg/d	4.30± 0.49	2.78± 0.29*	3.10± 0.19*	3.79± 0.32	2.90± 0.30*	3.05± 0.20*	4.18± 0.73	3.08± 0.16*	3.18± 0.12*	4.46± 0.83

*Significant at P<0.05

REFERENCES

1. Abou-Eleil, M. 2003. Compositional quality and microbiological evaluation of camels milk at Matrouh Governorate. M.V.Sc.ThesisFac.Vet.Med.Alex. Univ.

2. Ahmad, Nagwa, S. 2002. Serum protein profile in cattle calves infested with cryptosporidia species. Egypt J.Comp.and Clinical Path.15 (1)149-155.

3. Arafa, M.; Gehan, H. and Nagwa A. 2007. Biochemical and pathological studies on sheep suffering from besnoltosisZag. Vet. J. 35, (1) 32-45.

4. Ashfaq,R. 1991. Study of coccidiosis in different age groups & estimation of Hb, PCV & total proteins in camels slaughtered in Lahore abattoir during the hot & humid months. J. Camel Pract. Res. 2: 241-252.

5. Babcock,O.andCushing,E. 2004. Goat lice :In :Diseases and parasites of sheep and goats, edited by Gove Hambidge.Delhi,BiotechBook,Vedams Book (p) Ltd. VardhamanCharve Plaza.Bulding9K.P.lock.New Delhi110088 India

6. Blaxter, K. and wood, W. 1953. Some observation on the biochemical and physiological events associated with diarrhoea in lambs.Vet.Rec 65,889-893.

7. Blood, D. and Radostitis, O. 1989. Vet. Medicine.Atext book of the diseases of cattle, sheep, goats and horses.7thEd.Bailliere London, Sydney, Tokyo, Toronto.

8. Boid, R.; Jones, T. and Luckins.A. 1986. The camel in health and disease.3. Protozoal diseases of camels. Br. Vet. J. 141:87-105.

9. Byron L. Blagburn, Jennifer A. and Heather D. 2007. Cryptosporidium and Cryptosporidiosis, 2nd Ed. Edited by Lihua Xiao and Ronald Fayer Pages 255–287

10. Chhabra, M.; Sangwan, A. 2006. Parasitic diseases of camels and update. 1. Protozoal diseases. Journal of Camel Practice and Research. 13(1): 7-14.

11. Chineme, C. 1980. A case report of coccidiosis caused by Eimeriacameli in a camel (Camelusdromedarius) in Nigeria. J. Wildlife Dis. 16: 377-380.

12. Coles, E. 1986. Veterinary Clinical Pathology.4thEd. W.B.Saunders Company Philadelphia, London, Teronto, Mexicocity, Sydney Tokyo, Hong Knog.

13. Daugschies, A. , Agneessens, J., Goossens, L., Mengel, H. and Veys, P. (2007): The effect of a metaphylactic treatment with diclazuril (Vecoxan®) on the oocyst excretion and growth performance of calves exposed to a natural Eimeria infection, Veterinary Parasitology 149, pp. 199-206.

14. Doumas, B , Carter, R , Peers, T and Schaffer, R. 1981. Method for estimation of total protein in serum.Clin.Chem.27.1642

15. Drupt,F. 1974. Colorimetrcmethed for determination of albumin.Phar. Bio. 9

16. El-Gaml, A, Hashem-ME and Hatab, M. 2001. Diarrhea in kids attributed to E.coli and cryptosporidium.Assiut-Vet.Med.J.45:89,132-143

17. El Salahy, M. and Arafa, I. 2000. Parasitological studies on some gastroint-estinal parasite of camels in Assiut Governorate with special reference to zenotic nematodes. Assiut Vet.Med.J.43 (87)280-290

18. Fayer, R; Speer, C and Dubey, J. 1997. General biology of Cryptosporidium, p.2-41.In:R.Fayer (ed.), Cryptosporidium and Cryptosporidiosis.CR Press, Boca

19. Fouda, T and Al Mujalii, A. 2007. Enteritis in Arabian camel-calves: clinical and laboratory investigations. J. of Camel Pract. and Res.; 14(2): 119-124.

20. Gindler, E. 1972. Determintion of serum calcium level.Am.J.Clin, Path (58) 37

21. Goldenberg, H. 1966. Estimation of serum inorganic phosphorus. Clin. Chem 12

22. Henriksen, S. and Pohlenz, J. 1981. Staining of cryptosporidia by a modified Zieh-Nelsoen technique. Acta Vet Scand, 22(3-4):594-596.

23. Henry, R. 1974. Colorimetric detrmination of creatinine. Clin. Chem. Prinicip.

24. Jain N. 1986. SchalmsVetHaematology 4th Ed., Lea&Fibiger, Philadelphia, USA

25. Janoff, E.N and Reller L. 1987. Cryptosporidium species, a Protean Protozoan. J. Clin. Microbiol. 25: 967-975

26. John, D. 1982. Laboratory Mothed for Determination of Alkaline Phosphates. 9th Ed. 580-581.

27. Jones, T and Hunt, R. 1983. Vet Pathology5thed.Lea and Fibiger Philladephia.

28. Kaneko J. 1989. Clinical Biochemistry of Domestic Animals. Acad. Sci. Press. Inc. N.Y. London. 4th Ed 365 - 391.

29. Kirkpatrick, C. 1985. Cryptosporidium infection as a cause of calf diarrhea. Vet. Clin. North Am. Food Anim. Pract. 1:515:528.

30. Kinne, J. and Wernery, U. 1997. Severe outbreak of camel coccidiosis in the United Arab Emirates. J. Camel Pract. Res. 4: 261-265.

31. Kumar, B and Hafeez, M. 1999. Efficacy of monensin and amprolium against subclinical coccidiosis in lambs.Indian-Vet.J.76(11): 965-967

32. Levine, M. 1987. A guide to laboratory techniques used in the study and diagnosis of avaincoccidiosis.Folia Vet. Iatina 6:10-17.

33. Long, P.; Joyner, L.and Millard, B. 1979. E.coli the cause diarrhea, enterotoxigenic, enteropathogenic, enteroinvasive, enterohemarhagic and enteroadherent. J. inf. Dis., 155:377-38.

34. Maes, L.; Cousement, W. and Verhyen, F. 1989. Species- specificity action of diclazuril (clinacox)R against different Eimeria species in the chickens. Proced of 5th international Coccidiosis Conference. Tours (France), 1989, 259-264.

35. Mahran, O. 2006. Epidemiological and parasitological studies on prevalence of gastrointestinal parasites of dromedary camels at Shalatin Region, Red Sea Governorate, Egypt and trials of treatment. Assiut Vet. Med. J. 52(111):149-162.

36. McDougald, L.; Seibert, B; Mathis, G. and Quarles C. 1990. Anticoccidial efficacy of diclazuril in broilers under simulated natural conditions in floor pens, Avian Diseases 34, pp. 905–910.

37. Omran, H.; Anwaar, M.A.andNagwa, A. 2005. Haemato-biochemical studies on buffalo-calves suffering from cryptosporidiosis with trials of treatment.4th Conf. of Faculty of Vet. Med. Mansoura University 565-574

38. Oser, B. 1979. Hawk's physiological chemistry.14thEd. McGraw Hill comp. Ltd., London

39. Osman, T and Busadah, K. 2000. Effects of age and lactation on some Biochemical constituents of camel in Saudi Arabia. J. Camel Pract& Res.7 (2)49– 52

40. Ozmen, O.; Sahinduran, S. and Yukari, B. 2004. Comparative evaluation on clinicopathological findings and treatment in acute and chronic coccidiosis of lambs and kids.Indian Vet.J.1206-1209.

41. Patton, C. and Crouch, S. 1977. Colorimetric determinat of urea in blood. Anal. Ch.Chem.49:464-469.

42. Pohlenz, J.; Mann, H. and Bemrick, W. 1978. Cryptosporidiosis as a probable factor in neonatal diarrhoea of calves.J.Am.Vet. Med. Ass.172:52 -57

43. Pugh, D. 2002. Sheep and goat medicine.W.B.Saunders Company USA1st Ed.

44. Radostitis, O.; Blood, D. and Gay, C. 2002. Veterinary Medicine, 10thEd, 1343, BaillereTindall, London, Tokyo, Philadelphia

45. Razawi S, Oryan A and Gowhari M. 2009. Prevalence of Cryptosporidium infection in camels in a slaughterhouse in Iran. Trop Biomed. 26(3):267-73.

46. Reitman, S. and Frankel, S. 1957. Colorimetric determination of SAST, SALT enzymatic activity.An.J.Clin.Path, 28:56

47. Ronald, F. 1991. Chronic cryptosprdiosis in a bactrian camel (camelusbactrianus. Journal of Zoo and Wildlife Medicine, 22 (2), 228-232.

48. Russel, S. 2003. The effect of coccidiosis on certain biochemical constituents of calves.Vet.Parasit.II.255-260

49. Saleh, M and Mahran, O. 2007. A preliminary study on cryptosporidiosis in dromedary camels at Shalatin Area, Egypt. Assiut Vet. Med.J.;53(112)95-108.

50. Sayed, S; Sadiek; A and Ismail, M. 1998. Clinical and Laboratory Investiga-tions on diarrhoea in Camels in Assiutprovince.Assiut Vet. Med. J 40(79)31-42

51. Soltane, R; Guyot, K and Ayadi, A. 2007. Prevalence of Cryptosporidium spp. in seven species of farm animals in Tunisia. Parasite; 14(4): 335-338.

52. Soulsby E. 1986. Parasitology of Demosticated Animal.7thEd, Bailliere, London

53. Spsswin, K. 1995. Software packet for Statistical analysis under window US A.

54. Svensson, C. 1993. The survival and transmission of oocysts of Eimeria spp. Vet Parasitol 69:211–218

55. Vanparijs, O.; Marsboom, R. and Desplenter, L. (1989): Diclazuril, a new broad spectrum anticoccidial drug in sheep. Vet.Parasitol, 68:489-495.

56. Yakhchalim, M and Cheraghi, E. 2007. Eimeriosis in dromedary camels in the Miandoab region, Iran. ActaVeterinaria Beograd.; 57(5/6): 545-552Zak, B.(1958):Determination of serum cupper.Clin. Chem. Acta (3)328.

57. Yakhchalim M and Moradi T. 2012. Prevalnce of Cryptosporidium-like infection in one-humped camels of northwestern Iran. Parasite. 19(1):71-5.

58. Zhou, H; Wang, W. and Wang, C. 2010. Actin-depolymerizing factor of second generation merozoite in Eimeriatenella: clone, prokaryotic expression and http://www.sciencedirect.com.zdl.zu.edu.eg:81/science?_ob=ArticleURL&_udi=B6WFH-4YB5M7F-4&_user=4265827&_coverDate=07%2F31%2F2010&_alid=1456562146&_rdoc=1&_fmt=high&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=6795&_st=13&_docanchor=&view=c&_ct=222&_acct=C000062639&_version=1&_urlVersion=0&_userid=4265827&md5=45295ba6f419754f4e30dda6b31f52f6&searchtype=a hit47#hit47diclazurilhttp://www.sciencedirect.com.zdl.zu.edu.eg:81/science?_ob=ArticleURL&_udi=B6WFH-4YB5M7F-4&_user=4265827&_coverDate=07%2F31%2F2010&_alid=1456562146&_rdoc=1&_fmt=high&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=6795&_st=13&_docanchor=&view=c&_ct=222&_acct=C000062639&_version=1&_urlVersion=0&_userid=4265827&md5=45295ba6f419754f4e30dda6b31f52f6&searchtype=a - hit49#hit49 induced mRNA expression, Parasitology Research 106,71–76.

"دراسات عن الاعراض الاكلينيكيه والتغيرات المناعيه،الدمويه والبيوكيميائيه الناتجة عن معالجه الاسهال المسبب بالاوليات فى الابل حديثه الولاده".

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استهدفت هذه الدراسة معرفةكفاءة الداى كلازوريل والسلفامكسفى علاج الإصابة الطبيعية بالكوكسيديا والكربتوسبردیم فى الابل واستبيان بعض التغيرات فى صورة الدم وبعض الوظائف البيوكيميائية المصاحبةللإصابة بالكوكسيديا والكربتوسبردیم . تم عمل مسح لعدد ٧٠ من الابل (٦٥ تعاني من وجود الإسهال بصوره المختلفة –٥ بصحه جيدة) تتراوح أعمارها من ٣–٥ أسبوع فى أماكن مختلفة بمحافظة الشرقية. وبعد الفحص الباراسيتولوجى لعينات البراز الماخوذه من تلك الابل تم تقسيم عدد ٢٠ من تلك الابل الى ٤ مجموعات متساويه (كلا منها يحتوى على ٥ من الابل)،المجموعه الأولى ابل بصحة جيدة خالية من الاوليات (مجموعه ضابطه) والمجموعة الثانية ابل تعانى من الاصابه بالكوكسيديا ويتم علاجها باستخدام الداى كلازوريل والمجموعة الثالثة ابل تعانى من الاصابه بالكريتوسبوريديم ويتم علاجهم باستخدامالسلفامكس بينما المجموعة الرابعه ابل تعانى من الاصابه بالكوكسيديا والكريتوسبوريديم ويتم علاجهم باستخدام الداى كلازوريل والسلفامكس . تم اخذ عينات براز من كل الابل فى كل المجموعات قبل بدايه العلاج و ١ ،٥ ،٧ ، ١٠ يوم بعد نهايه العلاج وذلك للفحص الباراسيتولوجى لتحديد كفاءه الداى كلازوريل والسلفامكس فى القضاء على حويصلات الكوكسيديا والكريتوسبوريديم وكذلك تم أخذ عينتين دم من كل جمل قبل بدايه العلاج و ١ ،١٠يوم بعد نهايه العلاج لدراسة تأثير الاصابه بالكوكسيديا والكريتوسبوريديم والعلاج على صورة الدم وبعض الوظائف البيوكيميائية وبعض المعادن.

بالفحص الباراسيتولوجى وجد ١٨ من الابل تعانى من الاسهال خاليه من اى نوع من الاوليات بنسبه٢٧.٦٩ % وعدد ٤٧ من الابل تعانى من وجود الاسهال نتيجه للاصابه بالاوليات بنسبه ٧٢.٣١%. وقد بلغت نسبة الاصابة بطفيل الكوكسيديا ٥٣.١٩ % موزعه كالاتى : اصابه منفرده بالايميريا كاملى ١٠ (٤٠%) – اصابه منفردة بالايميريا درومدرى بنسبه٧ (٢٨%) – اصابه مشتركه من النوعين الايميريا كاملى+ ايميريا درومدرى ٨ (٣٢ %) – كما بلغت الاصابه منفرده بطفيل الكريتوسبوريديم ميرس ١٢(٢٥.٥٣%) و الاصابه مشتركه من الكوكسيديا والكريتوسبوريديم ١٠(٢١.٢٨%) .

الداى كلازوريل والسلفامكس فى علاج الكوكسيديا والكريتوسبوريدا بنسبة ١٠٠% حيث اختفت حويصلات الكوكسيديا والكريتوسبوريدا تماما .

الإصابة بالكوكسيديا والكربتوسبردیا فى الابل اديالى حدوث زياده معنويه فى عدد كرات الدم الحمراء، تركيز الهيموجلوبين، حجم خلايا الدم المرصوصة، الترانس أمينيزس(-AST

ALT)،الفوسفاتيز القاعدي،اليوريا والكرياتينين .ونقص معنوى فى البروتين الكلى، الزلال الجلوبيولين،الصوديوم،البوتاسيوم،الكالسيوم والفوسفور، ووجد أنالداى كلازوريل والسلفامكس كان لهما اثر جيد فى علاج الابل المصابه بالكوكسيديا والكربتوسبردیا وأديا إلي عودة هذه الوظائف إلي المستوى الطبيعي في مصل الابل المصابة والمعالج.

نستخلص من هذه الدراسة أن الكوكسيديا والكربتوسبردیا فى الابل احدثت بعض التاثيرات العكسية على صورة الدم وبعض الوظائف البيوكيميائية ولكن استخدام الداى كلازوريل والسلفامكس فى علاج الكوكسيديا والكربتوسبردیا أديا إلى تحسين الحالة الصحية للابل وعادت تلك الوظائف إلى وضعها الطبيعي بعد العلاج ب ١٠ يوم . لذلك ينصح باستخدم الداى كلازوريل والسلفامكس فى علاج الكوكسيديا والكربتوسبردیا فى الابل.