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EFFICACY OF TOLTRAZURIL /BAYCOX^{R}/ IN THE PREVENTION OF HEPATIC COCCIDIOSIS IN RABBITS

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I N T R O D U C T I O N

Hepatic coccidiosis caused by Eimeria stiedai is one of the important diseases of rabbit. This disease rarely caused great mortality but significantly decreases weight gain and increases feed conversion ratio of growing rabbit / Barriga and Arnoni, 1981 /. Condemnation of liver at rabbit slaughterhauses is sometimes very high / Varga, 1982 /.

For prevention of liver coccidiosis several preparations have been tested. Fitzgerald / 1972 / found that monensin / 0,005 and 0,02 % in feed /, was very effective against this disease. Lämmler and Hein / 1980 / got good results with salinomycin / 25 and 45 ppm in feed / in prevention of E. stiedai infection. According to Sambeth and Kaeter / 1980 / both these two ionophorous antibiotics / 50 ppm in feed / were very effective against hepatic and intestinal coccidiosis of rabbit. Peeters et.al / 1982 / and Joyner et al. / 1983 / found that Lerbek had a very good effect against E. stiedai infection. However there have been only a few watersoluble preparation which is potent anticoccidial in rabbit. Peeters and Geeroms / 1986 / reported that a relatively new preparation, toltrazuril / Bay Vi 9142 / was very effective against hepatic and liver coccidiosis of rabbit.

In this study anticoccidial effect of toltrazuril and

its influence on performance of growing rabbit were tested.

MATERIAL AND METHODS

Efficacy of toltrazuril /Baycox^{R}/ were investigated on eighty, 38 ± 2 days old New Zealand White weaned rabbits. The individually caged animals were divided into four groups : 1. infected, medicated, 2. infected, non-medicated, 3. non-infected, medicated, 4. non-infected, non-medicated.
Animals were fed with a pelleted feed of same composition /crude protein: 16 %, crude fiber: 12,5 % and metabolizable energy: 11,7 MJ / kg.

15 ppm toltrazuril, in drinking water was administered to rabbits of medicated groups for 21 days. The first day of treatment was 7 days before the experimentally Eimeria stiedai infection.

50.000 sporulated E. stiedai oocysts / rabbit were used for infection on the 10th day of experiment.

The total length of trial was 45 days.

Oocyst output of rabbits were determined by the McMaster oocyst-counting method. 10 fecal samples from every group were weekly examined.

γ- GT and AST serum enzyme activities of 10 animals from all groups were measured before infection and 14 days after it. The activity of γ- GT was assayed using Reanal diagnostic kit by colorimetric method, the activity of AST enzyme was measured with Reanal kit in UV test.

At the end of experiment every rabbits from the groups 1 and 2, five-five animals from the other two groups were slaughtered and the relative liver weight was determined by method of Peeters and Geeroms.

Efficacy of toltrazuril was evaluated on the basis of weight gain, feed intake, feed conversion ratio, mortality, oocyst shedding, serum enzyme activities and relative liver weight of rabbits from the four groups.

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R E S U L T S

The daily weight gain of rabbits belonging to different groups were summarized in Table 1.

Between 11-31, 32-45 days and during the total period of trial average daily weight gain of rabbits of infected, non-medicated group was significantly worse than that of other three groups.

Except the first period, feed intake of animals from infected, non-medicated group was significantly lower than feed intake of rabbits of other three groups. This difference was significant for the total length of experiment / group 1: 5470 g, group 2: 4220 g, group 3: 5100 g, and group 4: 5310 g/.

Feed conversion ratio of rabbits from the infected and non-medicated group was significantly worse than that of animals of other experimental groups in the second, third and whole investigated period / Table 1 /.

Mortality of infected and non-medicated group especially in the final period of experiment, was very high compared to mortality of other three groups / table 1 /. Of 14 died animals from this group, post mortem examination showed poor condition,very severe hepatic coccidiosis, and meteorism. In two other animals there were liquid diarrhoea without lesions caused by Eimeria stiedai. There were no symptoms of hepatic coccidiosis in died animals from other three groups. More or less severe enteritis and liquid diarrhoea could be seen in these carcases.

Oocyst shedding of rabbits of different groups are summarized in Table 2. At the beginning of trial most of animals shedded only low number oocysts. Eimeria stiedai oocyst could not be observed in faeces of rabbits. Examinations on the 7^{th}, 14^{th} and 21^{st} day gave the same results. On the 28^{th} day of experiment oocyst output of animals from infected and non-medicated group increased enormously. Exclusively E. stiedai oocyst could be seen in faeces of these animals. Examinations on the 35^{th} and 42^{nd} day also revealed very high oocyst output at these animals.

At the same time faeces of rabbits from the other three groups there was no oocyst or only a few oocysts could be found. E. stiedai oocyst was not observed in faeces of rabbits from these groups.

Examinations of γ- GT and AST serum enzyme activity gave a normal, low values at all animals before infection. / Table 2 /. On the 14th day after E. stiedai infection, activity of both γ- GT and AST enzymes in rabbits of infected and non-medicated group were high. At the same time activity of these enzymes in rabbits from the other three groups remained at normal, low level.

Relative liver weight of six animals from the infected and non-medicated group was high / 34,7 $\pm$ 12,5 / at the end of experiment. Values for the other groups were as fallows: infected, medicated group 5,2 $\pm$ 0,9, non-infected, medicated group 6,7 $\pm$ 0,6, non-infected, non-medicated group 6,5 $\pm$ 0,6.

Lesions caused by E. stiedai in liver of rabbits from infected non-medicated group were very severe / mean lesion score 4,0 /. In liver of animals from the other three groups there was no any lesion.

D I S C U S S I O N

Performance of rabbits treated with 15 ppm of toltrazuril in drinking water for three weeks and infected with 50.000 sporulated E. stiedai oocyst was nearly as good as that of animals of non-infected, non-medicated group. There were only small differences between average daily weight gain, feed intake, feed conversion ratio of rabbits from infected, medicated group and non-infected, non-medicated group. This is very important because most of anticoccidial drugs decrease performance of growing rabbit.

At the same time Baycox^{R} could protected animals from severe hepatic coccidiosis. Low mortality of infected, medicated group, lack of hepatic lesions in died animals, minimal oocyst output, normal values of γ- GT and AST enzymes and low relative liver weight in rabbits of this group, high mortality of infected non-medicated group, severe hepatic lesions in died

animals, very high oocyst output, elevated values of serum enzymes, high relative liver weight in rabbits from this group proved it. These findings are very similar to results of Peeters and Geeroms who also found that toltrazuril was a potent anticoccidial drug.

Table 1

Effect of toltrazuril /Baycox^{R}/ on weight gain, feed conversion ratio and mortality of growing rabbits

Group	Average daily weight gain/g/				Feed conversion ratio				Mortality	
	between 1-1o	11-31	32-45	1 45 days	between 1-1o	11-31	32-45	1-45 days	Total	caused by hepatic coccidiosis
1. Infected, medicated	28^{a}	33^{a}	22^{a}	29^{a}	$3,o9^{a}$	$3,97^{a}$	$4,82^{b}$	$4,37^{a}$	4	0
2. Infected, non-medicated	32^{a}	21^{b}	14^{b}	22^{b}	$2,82^{a}$	$5,6o^{b}$	$7,56^{c}$	$4,82^{a}$	14	12
3. Non-infected, medicated	29^{a}	$3o^{a}$	23^{a}	27^{ab}	$2,89^{a}$	$4,39^{a}$	$5,17^{a}$	$4,33^{a}$	4	0
4. Non-infected, non-medicated	29^{a}	34^{a}	$2o^{a}$	29^{a}	$2,99^{a}$	$4,17^{a}$	$5,26^{a}$	$4,31^{a}$	6	0

a, b, c, = the different small letters mean significant differences

Tabele 2

Effect of toltrazuril /Baycox^{R}/ on oocyst output and activity of γ-GT, AST enzymes of growing rabbit

Group	Oocyst output /noxlooo /g/							Serum enzyme activity			
	on the 0	7th	14th	21th	28th	35th	42nd day	γ-GT before inf.	γ-GT 14 days after	AST before inf.	AST 14 days
1. Infected,	1,36					o,o8	1,85	4,4	5,2	15,2	8,4
	±	o,o	o,o	o,o	o,o	±	±	±	±	±	±
medicated	1,12					o,o6	1,14	2,51	3,6	1,1	1,5
2. Infected,	o,52	o,22	1,24	1,48	358o	4525	2833	2,6	75,2	15,2	11o,2
	±	±	±	±	±	±	±	±	±	±	±
non-medicated	o,94	o,35	1,87	o,9o	123o	1253	141o	o,9	42,6	6,1	62,1
3. Non-infected,	1,88	o,o5				o,76	o,7o	4,o	3,5	14,7	15,o
	±	±	o,o	o,o	o,o	±	±	±	±	±	±
medicated	2,8o	o,o5				o,99	o,83	2,1	1,7	7,2	14,6
4. Non-infected,	8,1o	o,86	1,96	o,72	1,o2	o,83	1,42	3,8	3,o	14,3	1o,o
	±	±	±	±	±	±	±	±	±	±	±
non-medicated	6,6o	1,11	3,4o	1,19	1,14	o,64	1,22	1,1	2,2	3,o	4,8

References

BARRIGA, O.C. and ARNONI, J.V. 1981. Pathophysiology of hepatic coccidiosis in rabbits. Veterinary Parasitology,8. 201-210.

CATCHPOLE, J. and NORTON,C.C. 1979. The species of Eimeria in rabbits for meat production in Britain. Parasitology, 79. 249-257.

FITZGERALD, P.R. 1972. Efficacy of Monensin or Amprolium in the prevention of hepatic coccidiosis in rabbits. J. Protozool. 19 / 2 / 332-334.

GOMEZ - BAUTISTA, M., GARZIA, M.V. and ROJO - VASQUEZ, F.A. 1986. The levels of total protein and protein fractions in the serum of rabbits infected with Eimeria stiedai. Ann. Parasitol. Hum. Comp., 61. 4. 393-400.

GOMEZ - BAUTISTA, M., ROJO - VASQUEZ, F.A. and ALUND, A.J.M. 1987. The effect of the host's age on the pathology of Eimeria infection in rabbits. Veterinary Parasitology, 24. 47-57.

JOYNER, L.P., CATCHPOLE, J. and BERRETT, S. 1983. Eimeria stiedai in rabbits: the demonstration of responses to chemotherapy. Research in Veterinary Science, 34. 64-67.

LAMMLER, G. and HEIN, B. 1980. Prophylaktische Wirksamkeit des Polyäther - Antibioticums Salinomycin bei der Gallengangscoccidiose des Kaninchens. Berl. Münch. Tierarztl. Wschr. 93. 449-454.

NORTON, C.C., CATCHPOLE, J, and ELAINE ROSE, M. 1977. Eimeria stie-

dai in rabbits: the presence of an oocyst residuum. Parasitology. 75. 1-7.

PEETERS, J.E. and GEEROMS, R. 1986. Efficacy of Toltrazuril against intestinal and hepatic coccidiosis in rabbits. Veterinary Parasitology, 22. 21-35.

PEETERS, J.E., GEEROMS, R., MOLDEREZ, J. and HALEN, P. 1982. Activity of Clopidol / Methylbenzoquate, Robenidine and Salinomycin against hepatic coccidiosis in rabbits. Zbl. Vet. Med. B, 29. 207-218.

SAMBETH, W. and RAETHER, W. 1980. Proplylaktischer Effekt von Salinomycin gegen die Coccidiose des Kaninchens. Zbl. Vet. Med. B. 27. 446-458.

VARGA. I. 1982. Large-scale management systems and parasite populations: coccidia in rabbits. Vet. Parasitology. 11. 69-84.

VOROS. G. and GIPPERT. T. 1986. A field trial with some coccidiostats in a large-scale rabbit farm. Symposia Biologica Hungarica 33. 345-349.

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The anticoccidial effect of toltrazuril / Baycox^{R}/ and influence of it on performance of growing rabbit were tested. Of eighty 38 ± 2 days old growing rabbits 4 groups were randomly formed: 1. Infected, medicated, 2. infected, non-medicated, 3. non-infected, medicated, 4. non-infected, non-medicated. Animals of 1st and 2nd group were infected by 50.000 sporulated Eimeria stiedai oocysts on the 10th day of experiment. The average daily weight gain, the feed intake and feed conversion ratio of rabbits from infected and non-medicated group were significantly inferior to the same values of other three groups. There were great differences between mortalities, oocyst outputs, γ-GT and AST serum enzyme activities, relative liver weights of rabbits from the infected, non-medicated group and other three groups. The toltrazuril given 15 mg/ l drinking water for 21 days was very effective against E.stiedai challange and at the same time it did'nt decrease the performance of growing rabbits.

UNTERSUCHUNG ÜBER DIE WIRKSAMKEIT VON TOLTRAZURIL / BAYCOX^{R} / BEI KANINCHEN

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In der vorliegenden Arbeit wurde die Wirksamkeit von Toltrazuril /Baycox^{R}/ bei der Gallengangscoccidiose und der Leistung des Jungkaninchens untersucht. Es wurde von 320 Jungkaninchen, die 38±2. Tage alt waren, 4 Gruppen ausgestaltet /80 Tier pro Gruppe /: 1. infizierte, behandelte Gruppe
2. infizierte, nicht behandelte Gruppe
3. nicht infizierte, behandelte Gruppe
4. nicht infizierte, nicht behandelte Gruppe

Die Versuchsinfizierung erledigte man mit 50.000 Sporocysten von Eimeria stiedai im 10.Tag. Die Gewichtsentwicklung, Futterverbrauch, Futterverwertung wurden bei der infizierten, nicht medikierten Gruppe im Vergleich mit den anderen Gruppen reduziert.
Die Mortalität,die pathologisch-anatomische Veränderungen, die Oocystenausscheidung, Enzymaktivitäten im Serum / γ-GT und AST/ und das relative Lebergewicht zeigten auch bedeutende Abweichungen. Aufgrund der vorliegenden Ergebnisse kann Toltrazuril in Dosen 15 mg/ l Trinkwasser als gut wirkendes Coccidistaticum gegen die Versuchsinfizierung von Eimeria stiedai eingesehen werden, gleichzeitig verringerte nicht die Leistung der behandelten Tieren.