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SHEEP BLOOD SERUM CONSTITUENTS FOLLOWING TREATMENT OF GASTROINTESTINAL PARASITISM WITH SOME ANTHELMINTICS

(With 3 Tables)

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مكونات مصل الدم للأغنام التابعه لعلاج الديدان المعدى معويه ببعض طاردات الديدان

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تمت هذه الدراسه على عدد (٢٥) من الأغنام البلديه تراوحت أعمارها بين ١ – ٢ سنه ، حيث قسمت إلى خمسة مجاميع تكونت كل مجموعة من خمسة أغنام ، مجموعة ضابطة وأربعة مجموعات معالجه بالهيلمونيل ، الأيفوميك ف ، فيمرميزول والرينتال . وقد لوحظت هذه الأغنام اكلينيكيا ، وتم تجميع عينات من الدم على فترات ٧ ، ١٤ ، ٢١ و٣٠ يوم بعد العلاج لفصل مصل الدم وقياس بعض مكوناتة المختارة حتى يتسنى لنا تقدير تاثير هذه الادوية على الحيوانات المعالجة .

اظهرت النتائج البيوكيميائية ان العلاج عن طريق الفم بكل من الرينتال والفيرميزول ادى الى زيادة الألبيومين وفى نفس الاتجاة ادى العلاج عن طريق الحقن تحت الجلد بكل من الهيلمونيل والأيفوميثك الى زيادة كل من الالبيومين والجلوبيولين .

كما اتضح من النتائج وجود تاثير ضار طفيف بعد العلاج بالهيلمونيل وذلك بزيادة نسبه الكرياتينين ، اما باقى الادوية لم تثبت لها اضرار بعد العلاج .

SUMMARY

A comparative study was carried out to evaluate the effect of anthelmintics Helmonil, Ivomec F, Vermisole and Rintal on some selected sheep blood serum constituents (total proteins, albumin, globulins A/G ratio, total seurm cholesterol, total bilirubin and creatinine). It was found that the oral treatment with rintal and Vermisole increased the serum albumin. In the same side the increase of both albumin and globulins following S/C injection with Helmonil and Ivomec F was recorded. On the other hand there was a slight harmfull effect of Helmonil represented by increasing the level of blood creatinine. Ivomec F, Rintal as well as Vermisole had no harmfull effects.

INTRODUCTION

Infestation of sheep by gastrointestinal parasites still constitutes one of the major economic and health problems affecting sheep in Egypt. In a previous study *(ZAGHAWA et al 1992)*, it was proved that S/C injection of Ivomec (F) and oral drenching with Vermisole were the superior in the treatment of sheep gastrointestinal nematodes while the case was not so after treatment with Rintal and Helmonil. Details on clinical sings of experimental animals, causative parasites as well as severity of infestation were previously stated by *ZAGHAWA et al (1992)*. In addition, parasitic gastroenteritis is usually associated with alterations in either absorption and metabolism of protein ending to hypoproteinamia of infested animals (*SALEM et al 1990)*.

The persent work was carried out to investigat the effect of commericallly available anthelmintics (Helmonil, Ivomec F, Rintal and Vermisole) On some Selected blood serum constituents of naturally infested sheep with gastrointestinal nematodes and following treatment with the above mentioned anthelmintics. Studies blood serum parameters included total proteins, albumin, globulins, A/G ratio, total serum cholesterol, total bilirubin and creatinine.

MATERIALS AND METHODS

1- Animals and anthelmintics.

Twenty five balady sheep (1-2 years old) were found naturaly infested with gastrointestinal nematodes *(Haemonchus*

contortus, Strogyloides papillosus, Chabertia ovina and Trichostringylus species).
Infested animals were classified into 5 group (a,b.c.d,e,) each group was of five animals.
-Group (a) control non treated
-Group (b) treated with Helmonil (Alved Products, India) injected S/C (1 ml/ 50 kg B.W).
-Group (c) treated with Ivomec (F) as nematocide and fasciolicide produced by *MSD*,USA injected S/C (1 ml/50kg B.W).
-Group (d) treated with Vermisole orally (1 g/10 kg. B.W).
-Group (e) treated with Rintal orally (2.5% suspension). (Bayer Leverkusen Germany) The dose was (1 ml/5 kg B.W.).

2- Samples and Methods:

Blood samples were collected from jugular vein at 7, 14, 21 and 30 days post treatment to obtain serum.
Seperated serum samples were analysed for total protien, *WEICHSEBAUM 1964)*, albumin *(Bartholoimer and Delancy, 1966)*, globulins *(Coles, 1974)*, total serum cholesterol *(Zak et al., 1954)*, total surum bilirubin *(Cantarow and Trumper 1962)*, and Creatinine *(Seeling and Wust 1969)*.
-Statistical Analysis was performed on personal computer system *(SAS, 1986)*.
-Testkits supplied by Egyptian American company for laboratory services were selected for analysis.

RESULTS

-Table (1): reveals the mean values of selected blood serum constituents in the anthelmintics treated sheep as well as the control non treated one.
-Table (2): illustrates L.S.D.
-Table (3): Shows the correlation coefficient.

DISCUSSION

The efficacy of Helmonil, Ivomec F, Rintal and Vermisole against gastrrointestinal nematodes of sheep under field conditions in Egypt was studied by *ZAGHAWA et al (1992)*. The criteria for judging the efficacy were the faecal examination,anaemia, eosinophilia, diarrhoea and body gain. It was found that the S/C injection of Ivomec-F and Vermisole adminestrated orally were suprior in treatment of

gastrointestinal nematodes in sheep, while Rintal orally and Helmonil S/C were quite equal in their incomplete nematocidal effect.

In continuation to the abovementioned work a comparative study was carried out here to evaluate the effect of these anthelmintics on some selected sheep blood serum constituents (total serum proteins, serum albumin and serum globulins) to judge other criteria for the drug efficacy as well as the harmfull effect of the anthilmintics (total serum cholesterol, serum bilirubin and blood creatinine) under field condition.

Concerning the criteria of total serum proteins, the results are presented in table (1), which declairs a significant ($P<0.05$) decrease in total serum proteins in non treated group (a). These results are in agreement with *BLOOD and RADOSTITIS (1989),* who recorded that the total serum proteins decrease in naturally worm infested sheep.

Among the treated groups, group b&c exhibited highly maximum significant ($P< 0,01$) variation in total serum protein level as compared with control group (a) while non signifcant ($P> 0.05$) increase in group d&e was evident. Similar results were reported by *ABD-EL-ALL.* et al., *(1990), SALEM* et al., *(1990)* and *MAGDA (1993).* This explains that Helmonil and Ivomec (F) caused an obvious improvment of the total serum proteins level more quiker than the other used anthelmintics (Vermisole and Rintal).

Results of F test revealed that the treatments programme significantly ($P< 0,05$) improved blood serum total protiens (table 2), without regarding to time after treatment. Meanvalues total serum protiens levels were negatively correlated with Albumin, A/G ratio, and Bilirubin and positively correlated with Globulins, total serum cholesterol and creatinine (table 3).

In table (1) the mean value of Albumin in groups d&e showed highily significant ($P< 0,1$) increase in contrast to the non treated group (a). These results are supported by *ABD-EL-ALL* et al., *(1990), and SALEM* et al., *(1990),* as well as *ROSS and TOOD (1965)* who reported that the infestaion with nematodes, in particular caused lowered blood serum protein specially albumin fraction.

Our results proved that serum globulins in group (d) was highly significant ($P< 0.01$) decreased but it was only significantly decreased ($P< 0,05$) in groups (b&c) and (e) when compared with group (a) which showed significant ($P< o,05$)

increase in serum globulins. Such an increase in the last group is a result of decreaced albumin level due to the infestaion (table 1). These results are in agreement with *SHAWKAT* et al., *(1991)* who explained that the serum total proteins and serum albumin levels showed a significant drop in infested sheep compared with normal resulting in significant rise in serum globulins. These values returned to the normal level after medication with anthelmintics.

In a trial to illucidate the harmfull effect of such anthelmintics, estimation of total serum cholesterol, total bilirubin and blood creatinine levels were carried out (table 1).

The total serum cholesterol revealed a significant ($P< 0.05$) increase in its level in groups (b&e) in comparision to the control group (a)

With regard to serum total bilirubin, results (table 2) proved highly significant ($P< 0.01$) decrease in group b&c, only significant ($P< 0.05$) decrease in group (d), while there was highly significant ($P< 0.01$) increase in group (e). Available literature lackes information about the effect of Helmonil, Ivomec (F) Vermisole and Rintal on the blood serum total cholesterol and blood serum total bilirubin levels.

Blood serum creatinine values revealed a significant ($P< 0.05$) increase in group (b) in comparrision to the non treated group (a). Meanwhile there was no noticable variation in blood serum creatinione level in groups (c,d&e) in comparision to the non treated control group (a). This indicates a slight harmfull effect of Helmonil on the treated sheep. Similar results were reported by *MAHMOUD* et al., *(1986)*.

It can be concluded that, the oral treatment with Vermisole and Rintal increase the serum albumin. In the same side the increase of both serum albumin and globulins following S/C injection with Helmonil and Ivimec-F was recorded. Helmonil and Ivomic-F caused an obvious improvement of the total proteins level more quicker than Vermisole and Rintal. On the other hand there was a slight harmfull effect of Helmonil as represented by increased level of blood serum creatinine and total cholesterol. Ivomec F, Rintal as well as Vermisole showed no harmfull effect.

REFERENCES

Abd-El-All.T.H.S.; Ali, H.S; Karram, M.H.; Ahmed, S.M; Laila and Ismail, M.N. (1990): Effect of systamex in sheep, 4th. Sci. Cong. Fac. Vet. Med. Assut Univ.

Bartholomer, R.J. and Delancy A (1966): Serum albumin proc. Aust. Associ Clin. Biochemist. Cited in Varley H., (1979) parctical Clinical Biochemistry 4th. Ed. anold heineman pouls. Pres New Delhi.

Blood, D.C. and Radostitis O.M (1989): Veterinary Medicine. a text book of the diseases of cattle, sheep, pigs, goats and horses. 7 th. Ed. The University Printing house Oxford.

Cantarow A, and Truumper M. (1962): Clinical Biochemistery. 6th. Ed. London and Philadelphia. W.B. Saunders Co.

Coles, E.H. (1974): Veterinary clinical Pathology. 1st.Ed.Saunders Co. Philadelphia and London.

Magda, S. El-Sayed (1993): Serum protien pattern of parasitic gastro entritis in sheep. J. Vet. Med. Res. Beni Suef Vol. 111. No. 1 (62-68).

Mahmoud, A.A.; Taha, N.M. and Otify, Y.Z. (1986): Studies on Febantel (Rintal R) on gastro intestinal nematodes in Calves. Alex. J. Vet. Sci. Vol. 2 No. 1 (393-4030

Ross, J.G. and Tood J.R. (1965): Biochemical, serological and haematological changes in association with infections of Calves with nematodes parasite Ostertagia Ostertagia 2. Brit. Vet. J. 121, 6, (55-64).

Salem, A.A.; Ghanem, F.M. and Hosein, H.I. (1990): Effict of some anthelmintic on parasitic gastroentetis and blood serum parameters of Buffalo Calves. J. Egypt Vet. Med. Ass., 50, 1, (47-55)

Seeling, H. and Wust, S. (1969): Atztl, 15-34. Cited in pamphelet of biochemical kits.

Shawkat E.M; Abdel-Halim M.M.; Kubesy, A.A.; Rakha G.M. and El-Fauomu, M.M. (1991): Clinical and therapeutic studies on parasitic gastroententis in sheep. Vet. Med. J. Giza 39, (2): (255-266).

Statistical analysis system (SAS) (1986): User,s Guide statistics. SAS institute cany North Carolina.

Weichselbaum, T.E. (1964): An accurate and Rapid method for determination of protine in small amount of blood serum and plasma. Amer. J. Clin. Path. 16-40.

Zaghawa, A.A; Abu-Elwafa. and Magda S. Elsayed (1992): Efficacy of Helmonil, Ivomec (f), Rintal and Vermisole against gastrointestinal Nematodes of sheep under fielld condition

in Egypt. Proc. 5th cong.Fac.Vet. Med. Ass. Uni. Nov. 8-10, 1992.

Zak, B.; Dickenman R. whiteE Burnet H, and Cherneyp (1954): Rapid estimation of free and total cholesterol. Amer J. Clin. path. 24-1307-1308.

Table (1): Mean values of some blood serum constituents in anthelmintics treated sheep.

Item	No	X ± S.E						
		Total protein gm.%	Albumin gm.%	Globulin gm.%	A/G ratio	total cholesterol mg.%	Bilirubin mg.%	Creatinine gm.%
-Treatment								
a	16	6.58 ± 0.18	3.25 ± 0.19	3.39 ± 0.17	0.96 ± 0.11	201.79±18.88	0.598 ± 0.07	1.02 ± 0.01
b	15	8.04 ± 0.34	4.69 ± 0.18	3.35 ± 0.36	1.65 ± 0.25	279.58±13.26	0.309 ± 0.05	1.50 ± 0.11
c	16	7.05 ± 0.36	4.97 ± 0.11	2.08 ± 0.34	0.41 ± 0.33	277.14±12.88	0.300 ± 0.02	1.11 ± 0.02
d	16	7.49 ± 0.23	5.41 ± 0.09	1.98 ± 0.26	0.26 ± 0.33	119.28± 6.15	0.473 ± 0.07	1.17 ± 0.04
e	14	7.11 ± 0.45	5.07 ± 0.14	2.29 ± 0.39	3.65 ± 0.89	155.71± 5.86	0.643 ± 0.12	1.15 ± 0.04
-Time (week)								
1st week	20	8.09 ± 0.31	4.60 ± 0.19	3.59 ± 0.38	1.66 ± 0.22	289.40±11.49	0.708 ± 0.09	1.21 ± 0.05
2nd week	20	8.07 ± 0.27	4.70 ± 0.22	3.48 ± 0.38	2.21 ± 0.16	287.43±13.17	0.408 ± 0.06	1.16 ± 0.03
3rd week	18	7.57 ± 0.34	4.70 ± 0.22	3.03 ± 0.46	2.09 ± 0.31	288.40±11.81	0.430 ± 0.04	1.21 ± 0.11
4th week	19	7.53 ± 0.20	4.70 ± 0.20	2.94 ± 0.43	2.68 ± 0.72	218.47±12.41	0.366 ± 0.06	1.16 ± 0.03

a- Control group
b- Helmonil treated group
c- Ivomec F treated group
d- Vermisole treated group
e- Rintal treated group
X ±S.E mean± standard error

Table (2) :
Least square analysis .

S . O . V		M . S Ttotal protein	M . S Albumin	M . S Globuline	M . S A/G ratio	M . S Total cholesterol	M . S Bilirubin	M . S Cereatinine
Treatment	4	5.268**	11.228**	38.039**	10.858**	88696.46**	0.233*	0.588**
Time	3	2.331	0.862	2.633	5.671*	81.87	0.461**	0.831**
Treatment X time	12	1.893	0.219	1.347	0.718**	449.54**	0.158**	0.144**
E . E	57	1.457	0.298	1.236	1.858	5682.94	0.843	0.025

- S . O . V Source of variance .
- D . F Degree of freedoum .
- M . S Mean square .
- E . E Expermintal error .
- A/G ratio Albumine / Globuline ratio .

Table (3) :
Pearson Correleation Coefficients / Prob > : R : under Ho : Rho = 0 / N = 77

	Total protein	Albumin	Globuline	A/G ratio	Cholesterol	Bilirubin	Cereatinine
Total protein		-0.24162*	0.79517**	-0.59222**	0.32081**	-0.06921	0.08948
Albumin			-0.78498**	0.39897**	-0.24375*	-0.03482	0.13741
Total globulins				-0.64239**	0.27952**	0.07887	-0.11438
A/G ratio					0.28257**	-0.06209	-0.04716
Total cholesterol						-0.36855**	0.23866*
Bilerubin							-0.12315
Creatinine							

- : Negative correlatio
* : Significant at P < 0.05
** : Highly significant P < 0.01