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د راسة بعض القياسات البيوكيميائية والد موية تحت تأثير

العلاج التجريبي بمادة الباناكيور

في الحمير

ثروت نافع ، أحمد عامر ، ثروت عبد العال ، محمد كرام

اختير عدد ١٦ حمار متوسط اعمارها من ٣٦ الى ٤٦ سنة . ثبت من الفحص الاكلينيكي والمعملي انها مصابة بالديدان الاسطوانية . جرى تقييم لبعض المكونات الد موية والبيوكيميائية قبل وبعد علاجها بمادة (باناكيور) كمضاد للديدان المعوية . اختيرت الجرعة لتكون ٥ مجم من المادة الفعالة / كجم وزن حي واعطيت عن طريق الفم لمرة واحدة .

سجلت الصورة البيوكيميائية ارتفاعا معنويا جدا في نسبة سكر الدم (الجلوكوز) وكذلك البروتين بعد العلاج بخمسة أيام للأول وعشرة أيام للثاني على التوالي وسجلت الصورة الد موية انخفاضا وقتيا في العدد الكلي للخلايا الحمراء في اليوم الخامس بعد العلاج ، بينما عادت الى النسبة المسجلة قبل العلاج في اليوم العاشر بعد العلاج وسجل الهيموجلوبين تحسنا معنويا في اليوم الخامس عشر بعد العلاج .

أما متوسط حجم الخلايا الحمراء فقد سجل زيادة معنوية بينما حدث انخفاضا معنويا في عدد الخلايا البيضاء وكذلك نسبة الخلايا الغير ناضجة . وسجلت نسبة الخلايا المتعادلة والخلايا الاكولة زيادة معنوية . ولقد ثبت أن مادة (باناكيور) المستخدمة في العلاج ذات فاعلية اكيدة حيث تخلصت الحيوانات من الديدان وانقطع نزول البويضات الخاصة بتلك الديدان في اليوم الخامس بعد العلاج تماما ولمدة ستة شهور بعد العلاج .

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**SOME BIOCHEMICAL AND HAEMATOLOGICAL
INDICES UNDER THE EFFECT OF PANACUR IN DONKEYS**
(With 3 Tables & 1 Fig.)

By
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SUMMARY

A group of 16 Donkeys aged 3.5-4.5 years were proved to be heavily infested with Trichostrongylidae (1971. 9 ± 1297.2 Egg/gm faeces). Evaluation of some biochemical and haematological parameters was carried out before and after treatment by Panacur* as an anthelmintic. The used dose was 5 mg Fenbendazole (Panacur) /1 kg B.W. orally for one time, The biochemical picture recorded highly significant elevation in serum glucose and in total protein levels 5 and 10 days after treatment.

A temporal significant oligocythaemia was evident 5 days post treatment that returned to the normal levels 10 days post treatment. There was a marked improvement in the haemoglobin levels 15 days post treatment. A highly significant increase was recorded in the Mean Corpuscular Volume (M.C.V) while a highly significant leucopenia, lowered immature reticulocytes with highly significant Neutrophilia and Monocytosis. Panacur** has proved to be a highly effective anthelmintic for donkeys as the total egg count/gm faeces has been dropped sharply after dosing. All donkeys proved to be free from the parasitic infestation 5 days after treatment and no parasitic eggs detected in their faeces.

INTRODUCTION

Intestinal parasitic infestation especially naematodes have been proved to induce serious troubles in equines in Egypt (EZZAT, 1960). These troubles may be due to the parasitic effects on the biochemical constituents of blood (EL-REFAI and SOLIMAN, 1965). On the other hand, the subclinical infestation by naematodes can adversely affect the weight gain and skeletal development of growing animals (SYKES, *et al.* 1975 & SYKES and COOP, 1976). HORTON (1977) indicated that some serum constituents returned to their normal levels after full recovery which may take several weeks post anthelmintic treatment.

* Fenbendazole: Developed by the research Dept. of Hoechst AG.

** The above mentioned data is not to be used by any dealer for marketing the drug.

TH. NAFIE, *et al.*

COOP, *et al.* (1984) recorded that a great improvement in serum phosphorus and serum albumin in lambs treated with Panacur. The Enzyme activities of alkaline phosphatase and glutamic pyruvic transaminase showed a great improvement in horses post anthelmintic treatment (REFUERZO, *et al.* 1952; ERSHOV, 1956 and EL-ABDIN, *et al.* 1983), however the serum urea and creatinine values showed no significant variations.

Efficacy of Fenbendazole (Panacur) on naematodes causing parasitic gastro-enteritis in sheep, Goats and cattle had been studied by ROSS (1974); BECKER (1975); BALI & SINGH (1977); KALITA, *et al.* (1978); GUPTA, *et al.* (1981); KATHIRIA and AVSATHI (1983) and COOP, *et al.* (1984). In equines panacur proved to be highly effective CORBA, *et al.* (1980) and NIKANDER, *et al.* (1984).

The present study aimed firstly to evaluate some biochemical and haematological variations after treatment of a group of donkeys by Panacur, Secondly to evaluate the efficacy of Panacur in treatment of gastro-intestinal parasites in naturally infested donkeys under experimental conditions.

MATERIAL and METHODS

Sixteen donkeys aged between 3.5-4.5 years and having a body weight between 60 and 80 kg. were clinically suffering from emaciation, easily detached hair, loss of condition and poor appetite. The faecal examination revealed that they were highly infested with naematodes. *Strongylus* and *parascaris* eggs were the main detected intestinal parasites. These animals were chosen to be given a therapeutic dose of panacur under experimental conditions. The experimental animals were kept under complete hygienic conditions at the Veterinary Clinic of the Faculty of Veterinary Medicine, Assiut University. The animals were treated by Panacur powder (Suspension form) orally at a dose of 5 mg Fenbendazole /kg Body weight for one dose.

Daily clinical examination and daily faecal samples were quantitatively examined using McMaster Technique. Egg count per gram faeces was recorded.

Blood samples were collected from jugular vein. Serum was separated and subjected to biochemical assays. Unclotted blood samples—using Ethylene Diamine Tetra Acetic Acid (E.D.T. A) - were obtained for haematology. Blood samples were collected before treatment and at 5, 10, 15 days post treatment. The haematological findings including total red Blood cells count (TRBCS), Total white Blood Cells count (TWBCS), Haematocrit Value (P.C.V. %) Haemoglobin (Hb gm/dl), Mean corpuscular Haemoglobin (M.C.H. μ g), Mean corpuscular Haemoglobin content (MCHC %) and Mean corpuscular volume (MCV μ^3) were estimated according to SCHALM (1979). Differential leukocytic count was performed according to COLES (1980).

The Biochemical determination of serum total protein, Serum Iron and serum glucose was performed using test kits* (WEICHELBAUM, 1946; PICCARDI, *et al.* 1972 and WERNER, *et al.* 1970). Statistical analysis of data was carried out using T-test (SNDECOR, 1956).

* Bio Merieux Laboratory reagent & product/Bains/France.

EFFECT OF PANACUR IN DONKEYS

RESULTS

No side effects were observed following the treatment of the experimental animals using Panacur at the given doses. *Strongylus* and *Parascaris* eggs were the main detected intestinal parasites.

The Faecal examination revealed that the mean egg count before treatment was (1971,875 \pm 1297.18 Eggs/gm faeces) and the range was 350 - 4850 egg/gm faeces. The mean egg count was decreased to (950.31 egg/gm) one day post treatment. It reached the minimum level (100 egg/gm) 4 days post treatment. At the 5th day no eggs were discharged through faeces (Fig. 1).

It was noticed that great numbers of dead adult nematodes were discharged in the faeces one and two days post treatment. In some animals the dead worms were discharged mixed with faeces and in others discharged as balls of parasites. Negative Faecal examination was recorded for six months post treatment. The biochemical analysis revealed a highly significant elevation in serum glucose level and in total protein level 5 & 10 days post treatment respectively.

Serum Iron level was not significantly changed (table 1). The haematological picture recorded a significant decrease in T.R.B.Cs. count 5 days post treatment, however the count returned to its normal level 10 and 15 days post treatment. Haemoglobin value recorded a significant improvement 15 days post treatment. A highly significant increase was recorded in the Mean corpuscular Volume (M.C.V) 5 days post treatment. A highly significant decrease in total leukocytic count 15 days post treatment was observed (table 11). Highly significant decrease in the mean values of the immature reticulocytes (Band cells) was recorded on the 10th and 15th days post treatment, associated with highly increase in the percentage of mature neutrophils on the 15th day post treatment. Monocytes showed highly significant increase on the 10th and 15th days post treatment (Table III).

DISCUSSION

The biochemical analysis revealed a highly significant increase in serum total protein level (96.76 \pm 19.51 mg%) 10 days post treatment (table I). However serum glucose value was achieved a highly significant increase (81.99 \pm 13.89 mg%) 5 days post treatment and returned to approach nearly the pre-treatment levels (59.13 \pm 22.22 mg%). Regarding Iron values no significant changes were noticed. The increased total protein and glucose levels post treatment indicated that the metabolism of carbohydrates and proteins tended to be improved. The presence of mature parasites in the small intestine lead to reduction in gut motility, increase in the ratio of body water to body solids, lowering of the body pool of albumin and decreased ability to incorporate dietary methionine into plasma protein (CLAYTON, *et al.* 1980). However, REFUERZO, *et al.* (1952) attributed this improvement to the elimination of toxic metabolic substances of parasites by treatment. ERSHOV (1956) added the possibility of hepatic toxins formed as a result of decomposition of dead parasites and not to its metabolic toxins.

Total serum Iron showed no significant changes. This stabilization may be due to the body reserve of iron which utilized from storage organs under increased body needs.

The Haematological picture revealed a mild significant decrease in (T.R.B.Cs) 5 days post treatment and returned to the normal levels again 10 and 15 days post treatment. Haemoglobin concentration achieved a significant increase 15 days post treatment. Also MCV achieved

a highly significant increase 5 post treatment. These results were agreed with those obtained by STEEL and WHITLOCK (1960). The total leukocytic count achieved a highly significant decrease ($7.98 \pm 1.03 \times 10^3$) 15 days post treatment (Table II). The differential leukocytic count achieved a great improvement (Table III). Immature band cells recorded highly significant decrease 10 and 15 days post treatment, in contrast the mature neutrophils recorded highly significant increase ($46.31 \pm 3.198\%$). At the same time monocytes recorded highly significant increase 10 and 15 days after treatment. These results could be interpreted on the fact that the continuous overload on the immune system of the animal (Premunition) leads to increase band cells in circulating blood. After treatment, monocytes increased to remove dead parasites from the body.

Panacur proved to be highly effective anthelmintic against gastro-intestinal parasites. The faecal examination revealed the absence of either mature parasites or eggs 5 days post treatment, and the total egg count recorded zero value for all naematodes (Fig. 1). These results agreed with those obtained by ROSS (1974); BECKER (1975); BALI and SINGH (1977); KALITA, *et al.* (1978); GUBTA, *et al.* (1981); KATHERIA and AVSATTHI (1983) and COOP, *et al.* (1984) in sheep, Goat and cattle, and CORBA, *et al.* (1980); NIKANDER, *et al.* (1984) in equines.

It could be concluded that the treatment against gastrointestinal naematodes was very essential for the biochemical balance of these animals as it improves the metabolism of proteins and carbohydrates. From the other hand Panacur proved to be highly effective against gastro-intestinal parasites as it was completely eliminated the parasitic infestation.

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EFFECT OF PANACUR IN DONKEYS

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Table (I)
Biochemical parameters pre-and-post treatment with panacur

Parameter	Before Treatment	Post treatment		
		5 days	10 days	15 days
Total Protein mg%	71.79±15.08	74.99±17.51	96.76±19.51**	87.33±27.43
Total Serum Iron mg%	29.91±13.38	26.59±17.12	30.62±31.89	19.74±15.14
Serum Glucose mg%	59.13±22.22	81.99±13.89**	68.37±17.78	48.04±20.51

Table (II)
Hematological picture pre-and post treatment with Panacur

TRBCs x 10 ⁶ /cmm	5.84±0.95	5.08±0.96*	6.33±1.29	6.25±0.99
TWBCs x 10 ³ /cmm	14.93±3.68	16.86±4.66	18.65±6.74	7.98±1.03**
P.C.V. %	28.94±5.12	29.44±4.94	29.38±4.03	32.13±3.56
Hb. (gm/dl)	9.83±2.38	9.84±1.96	9.13±2.20	11.55±2.07
M.C.H.	16.96±3.46	20.12±5.69	14.74±3.59	18.93±4.67
M.C.H.C. (%)	43.04±5.28	33.49±3.26	30.82±4.31	35.93±5.42
M.C.V. (f)	47.79±10.78	62.34±12.47**	48.13±9.17	52.43±8.58

Table (III)
Differential leukocytic count pre-and post treatment with panacur

Band cells	13.3 ±6.57	9.69±5.04	5.94±2.38**	6.19±1.56**
Mature Neutroph	35.10±9.57	41.38±13.26	41.69±9.34	46.31±3.198**
Eosinophil	5.75±2.82	7.63±4.53	7.13±2.19	4.4 ±1.86
Basophil	0.75±1.0	0.23±0.34	0.44±0.73	0.25±0.45
Lymphocytes	41.5 ±14.39	39.8 ±12.03	39.75±9.46	35.75±5.63
Monoeytes	1.75±2.7	1.38±1.71	5.06±2.64**	7.19±2.54**

* Significant (P/ 0.05)

** Highly significant (P/ 0.01).

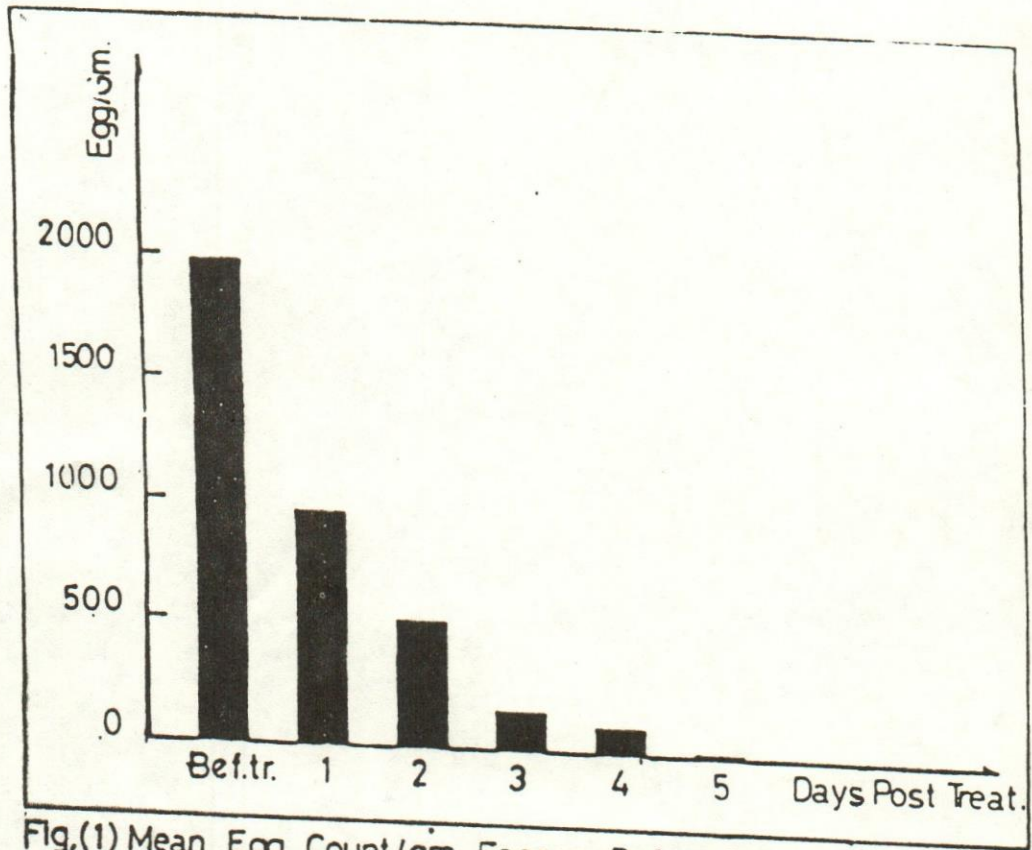


Fig.(1) Mean Egg Count/gm. Faeces Before & After Treatment.

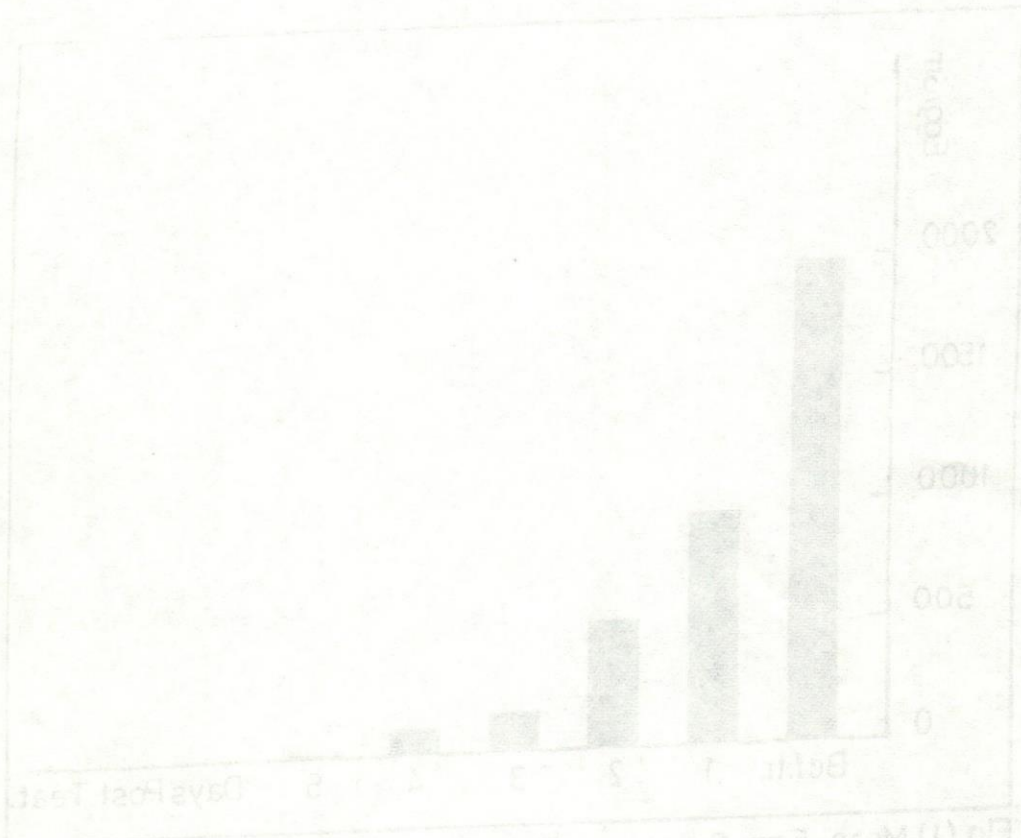


Fig. (1) Mean Egg Count (log scale) Before & After Treatment