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COMPARATIVE STUDY ON THE EFFICACY OF ALBENDAZOLE AND MIRAZID ON FASCIOLIASIS IN CATTLE

(With 6 Tables and 2 Figures)

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دراسة مقارنة عن كفاءة الالبندازول والميرازيد في علاج الديدان الكبدية في الأبقار

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أجريت هذه الدراسة فى محافظة بنى سويف على عدد 32 من الأبقار المصابة بديدان الفاشيولا وتتراوح أعمارهم من 2 – 5 سنوات وقد تم العلاج باستخدام عقار الالبندازول جرعة واحدة ومعدل 15 مج / كجم من وزن الحيوان وكذلك دواء الميرازيد (عشب المر) بمعدل 10 مج / كجم من وزن الحيوان وكررت الجرعات على ثلاثة أيام متتالية وكررت نصف الجرعة السابقة على ستة أيام في مجموعة أخرى ، وأثبتت النتائج أن عقار الالبندازول له تأثير جيد على الديدان البالغة فقط بدليل ظهور بويضات الفاشيولا في براز الحيوانات المعالجة بعد شهر تقريباً وهو أحد الاحتمالات لذلك. أما العلاج بالميرازيد فقد أثبت كفاءة أطول حتى الأسبوع الثاني عشر بعد العلاج ، وقد أظهر كذلك أمان في الاستعمال ، وقد أظهرت النتائج عدم ظهورای اعراض جانبية عند الاستعمال واثبتت زيادة كفاءة الدواء عند تكراره 6 أيام متتالية على الرغم أن هذا التكرار يمثل عقبة في استعمال هذا العقار الجديد في الحقل البيطري.

SUMMARY

The present investigation was carried out to clearify the efficacy of Albendazole at dose rate 15 mg/kg b.wt. and Mirazid (*Commiphora Mol-Mol or Myrrh)* at dose rate 10 mg/kg b.wt in treatment of fascioliasis in cattle. The results revealed that Albendazole resulted in efficacy 100% but in the 5th week post-treatment, reshedding of eggs in the faecees occurred, meaning that Albendazole is effective against mature flukes only. However Mirazid revealed that it is effective at 5th week until 12th week and its efficacy was 90% and 85% in 3 successive days or 6 successive days doses of treatment, respectively. It is concluded that Mirazid proved to be effective anti-fascioliasis drug but need development to prolonged times of administration of the drug.

Key words: *Albendazole, mirazid, fascioliasis, cattle.*

INTRODUCTION

Fascioliasis is still an important disease in farm animals specially localities near stagnant water. Examination of the animal faeces for *Fasciola* eggs showed prevalence rates of 30% in North Sinae Governorate up to 59.5% in Dakahlia Governorate for both cattle and buffaloes, an 7.0% in North-Sinai Governorate to 78.0% in Dakahlia Governorate for sheep (Soliman, 1998) as to *Fasciola* sp. in Egypt. In *Fasciola* infected animals, the economic losses due to metabolic disorders were 30 times higher than losses due to mortalities or condemunated parts in abattoirs (Ribbeck and Witzel, 1979). Nowadays, it is an important increasing zoontic disease not only in Egypt (Haridy *et al.,* 1999) but worldwide (Mas-Coma *et al.,* 1997). Concerning the effect of many fasciolicides drugs, Moll *et al.* (2000) in Holland and Thomas *et al.* (2000) in South Western Wales, reported the Triclabendazole resistantance to *Fasciola hepatica* in sheep and cattle. Precautions and warnings must be taken in using this drug as: ❶ animals, should not be slaughtered for human consumption within 30 days after treatment, ❷ do not using milk of treated animal for month ❸ keep out of reach of children, ❹ washing hands after use (Boary *et al.,* 1983). These indicate difficultsies in using the drug. Albendazole is effective against mature fluk (Min *et al.,* 1983) but less effective for immature flukes in sheep (Jones and Dickeson, 1979).

The present investigation aimed to evaluate the efficacy of Mirazid (*Comminphora Mol Mol or Myrrh)* as herbal drug used recently as fasciolicide. It is included in list of plants which are acceptable for use in foods in the Council of Europe (1981) and consideded safe natural substance approved by FDA for foods use (Ford *et al.,* 1992).

MATERIALS and METHODS

The present study was performed in endemic area in Beni Suief Governrate with high *Fasciolia gigantica* infection. This area was near the River Nile banks with chance of stagnention of water after increasing water flow in Summer.

In this experiment 32 *Fasciola* infected 2-5 years old cattle were employed, these animals were divided into 4 groups: Group (1): consisted of 10 cattles treated orally with 15 mg/kg. bwt. of Albendazole in single dose according to Min *et al.* (1983) and Misra *et al.* (1989)**.**

This drug was purchased from prepared Delta Farm Company. Group (2): consisted of 10 cattle treated with Mirazid at dose rate 10 mg/kg b. wt for 3 successive days orally on empty stomach, one hour before breakfast according to Haridy *et al.* (2003). Group (3): consisted of 7 cattle treated with Mirazid at dose rate 5 mg/kg b. wt for 6 successive days orally on empty stomach, one hour before breakfast according to Morsy *et al.* (2005). This drug was purchased from prepared Farco Company. Group (4): consisted of 5 cattle kept as control (non treated animals).

Detection and counting of *Fasciola* eggs in faeces of all examined animals was carried out according to Parffit and Banks (1970) for 2 successive days before treatment and at the 1st, 3rd, 5th, 8th and 12th week after treatment. Animals showing no eggs in their faeces in 2 successive examinations were considered free beside the progressive recovery of the symptoms of disease.

Evaluation of the efficacy of the drugs was assessed by the reduction of mean eggs excretion of each measurement point according to Foreyt formula (1998) as follows:

$$\text{Efficacy \%} = \frac{\text{mean number of eggs in control group - mean number of eggs in treated group}}{\text{mean number of eggs in control group}} \times 100$$

RESULTS

The results of the present study are shown in Tables 1,2,3 and 4 and revealed that Albendazole is more effective drug as proved by complete disappearance of the eggs from faeces in the 1st and 3rd week post treatment, but eggs reappear eggs again in 50% of treated animals. However, Mirazid gave 90% disappearing of the eggs from faeces of treated animals at dose rate 10 mg/kg b. wt for 3 successive days starting from the 5th week and until 12th week and also when it was given at dose rate 5 mg/kg b. wt for 6 successive days disappearance of eggs from faeces in 85% of treated animals at 5th week until 12th week.

Tables 5 & 6 and Figs. 1 & 2 illustrate that Mirazid efficacy in both 2 doses rate is higher than Albendazole for long time and that Mirazid is more effective when given for 6 days but prolonged times of administration resembles a difficulty for using that drug. Mirazid caused more disappearence of symptoms of the disease without side effects and saf to be used.

Table 1: Results of faecal egg count in *Fasciola* infected cattle before and after treatment with Albendazole at dose rate 15 mg/kg b. wt orally for single dose.

Animals No.	Eggs/gm faeces before treatment			Eggs/gm faeces after treatment				
	1st days	2nd day	Mean	1st week	3rd week	5th week	8th week	12th week
No.1	50	60	55	-ve	-ve	-ve	-ve	-ve
No.2	35	25	30	-ve	-ve	-ve	-ve	-ve
No.3	25	25	25	-ve	-ve	-ve	45	20
No.4	30	40	35	-ve	-ve	-ve	-ve	-ve
No.5	45	45	45	-ve	-ve	20	30	15
No.6	46	30	38	-ve	-ve	-ve	-ve	-ve
No.7	10	30	20	-ve	-ve	15	55	15
No.8	55	65	60	-ve	-ve	-ve	40	20
No.9	50	40	45	-ve	-ve	15	30	10
No.10	10	20	15	-ve	-ve	-ve	-ve	-ve

Table 2: Results of faecal egg count in *Fasciola* infected cattle before and after treatment with Mirazid capsules (300 mg) at dose rate 10 mg/kg b. wt orally for 3 consecutive days.

Animals No.	Eggs/gm faeces before treatment			Eggs/gm faeces after treatment				
	1st days	2nd day	Mean	1st week	3rd week	5th week	8th week	12th week
No.1	60	50	55	-ve	-ve	-ve	-ve	-ve
No.2	33	31	32	-ve	-ve	-ve	-ve	-ve
No.3	30	50	40	25	15	-ve	-ve	-ve
No.4	12	72	42	30	-ve	-ve	-ve	-ve
No.5	15	35	25	10	-ve	-ve	-ve	-ve
No.6	60	20	40	25	30	-ve	-ve	-ve
No.7	15	25	20	-ve	20	20	30	30
No.8	30	60	45	-ve	-ve	-ve	-ve	-ve
No.9	30	60	45	-ve	-ve	-ve	-ve	-ve
No.10	45	65	55	-ve	-ve	-ve	-ve	-ve

Table 3: Results of feacal egg count in *Fasciol*a infected cattle before and after treatment with Mirazid capsules (300 mg) at dose rate 5 mg/kg b. wt orally for 6 consecutive days.

Animals No.	Eggs/gm faeces before treatment			Eggs/gm faeces after treatment				
	1st days	2nd day	Mean	1st week	3rd week	5th week	8th week	12th week
No.1	10	30	20	-ve	-ve	-ve	-ve	-ve
No.2	60	44	52	30	30	10	20	20
No.3	40	50	45	-ve	-ve	-ve	-ve	-ve
No.4	25	25	25	-ve	-ve	-ve	-ve	-ve
No.5	10	30	20	-ve	-ve	-ve	-ve	-ve
No.6	15	25	20	-ve	-ve	-ve	-ve	-ve
No.7	40	20	30	-ve	-ve	-ve	-ve	-ve

Table 4: Results of feacal egg count of control untreated fasciola infested cattle

Animals No.	Eggs/gm faeces before treatment			Eggs/gm faeces after treatment				
	1st days	2nd day	Mean	1st week	3rd week	5th week	8th week	12th week
No.1	30	40	35	40	25	20	25	30
No.2	26	30	28	30	35	60	N.D.	N.D.
No.3	15	25	20	35	40	20	30	30
No.4	14	30	22	20	35	-ve	25	20
No.5	30	20	25	10	30	20	40	30

N.D. = Not done because it was lost.

Table 5: Comparative results between efficacy of Albendazole and Mirazid in treatment of *Fasciola* infected cattle during the same period of the experiment

D rug used	No. of Animals	Average number of eggs / gm of faeces of non- treated animals							
		1st day	2nd day	Mean	1st week	3rd week	5th week	8th week	12th week
Albendazole (one obese)	10 cattle	35.6	37.0	36.8	0.0	0.0	5.0	20.0	8.0
Mirazid (3 dose daily)	10 cattle	33.0	47.9	39.9	9.0	6.5	2.0	3.0	3.0
Mirazid (6 dose daily)	7 cattle	28.6	32.0	30.3	4.3	4.3	1.4	2.9	2.9
Control Non-treated	5 cattle	23.0	29.0	26.0	27.0	33.0	24.0	30.0	27.5

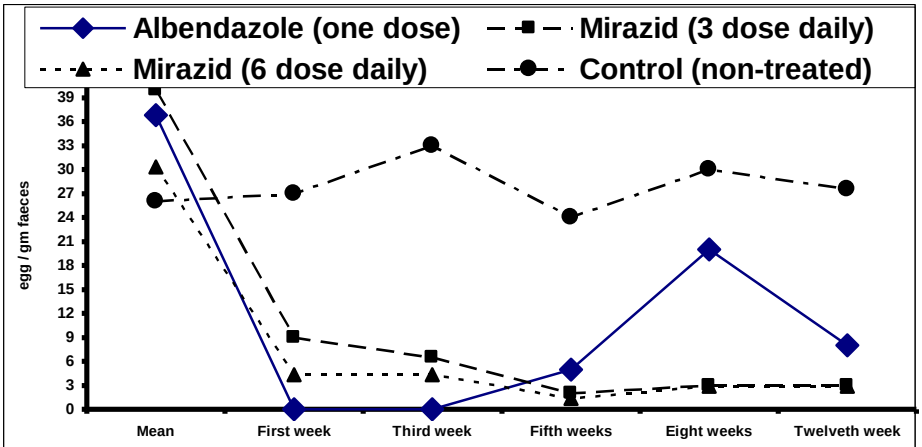

Fig. 1: Demonstration of comparative results between efficacy of Albendazole and Mirazid in treatment of *Fasciola* infected cattle

Table 6: The efficacy of Albendazole and Mirazid after treatment of fascioliasis in cattle

Drugs used	Efficacy after treatment (weeks) %				
	1st week	3rd week	5th week	8th week	12th week
Albendazole (single dose)	100	100	85	33	71
Mirazid (3 dose)	67	80	92	90	91
Mirazid (6 dose)	84	87	94	90	89

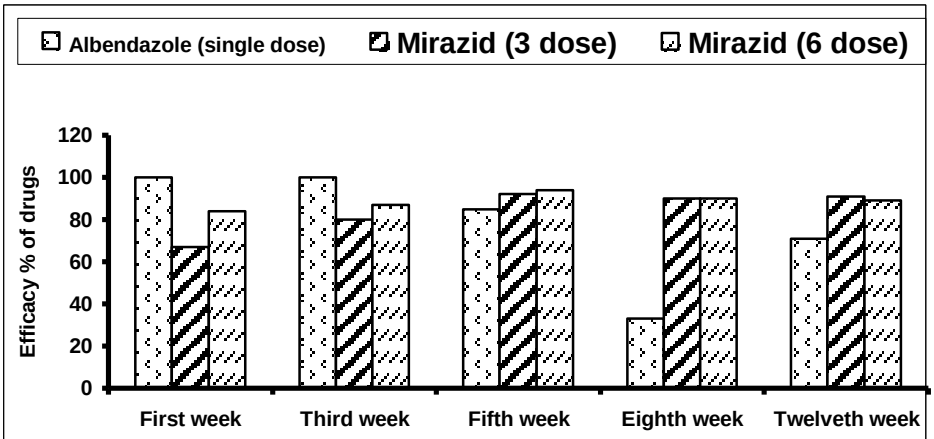

Fig. 2: Comparative results between efficacy of Albendazole and Mirazid in treatment of *Fasciola* infected cattle

DISCUSSION

The present investigation was done to study the efficacy of albendazole (chemical drug) as fasciolicidial comparatively to a new fasciolicidial herbal drug (Myrrh or *Commiphor*a Mol Mol) which is used recently in treatment of humaen fascioliasis and schistosomiasis (Haridy *et al.*, 1999).

The results (Table, 1) revealed that using Albendazole resulted in 100% efficacy after 3 weeks then begin eggs appeared in 30, 50 and 50% of treated animals in 5^{th}, 8^{th} and 12^{th} weeks respectively. This finding revealed that Albendazole efficacy at dose rate 15 mg/kg b. wt is 100% on mature flukes only. This finding is supported by Kumar and Pachauri (1989). Misra *et al.* (1989) recorded 96% efficacy; El-Sayed (1996) found that efficacy reach to 80%; Kako *et al.* (2000) reported efficacy 97% for adult flukes, at dose rate 20 mg/kg b. wt and Bulent *et al.* (2006) recorded that efficacy reach 66-76 on mature flukes as the eggs reappeat in faces of treatred animals after 4 weeks.

The results in Tables 2&3 revealed that treatment by Mirazid resulted in 90% disappearance of the eggs from the faeces at dose rate 10 mg/kg b. wt for 3 successive days at the 5^{th} week until 12^{th} week and resulted in 85% disappearence of eggs in the faeces of treated animals at dose rate 5 mg/kg b. wt for 6 successive days, these results are supported by Haridy *et al.* (2003) who found that Mirazid efficacy (cure %) was 100% in sheep naturally infected with *Fasciola* and treated at dose rate 600 mg/kg b. wt for 2 successive days or 300 mg/kg b. wt for 3 successive days watch is also supported by Morsy *et al.* (2005) who found that efficacy (cure %) was 100% in sheep naturally infected with Fasciola and treated at dose rate 600 mg/kg b. wt for 3 successive days, while efficacy was 50% and 100% at buffaloes and donkeys respectively at dose rate, 100 mg/kg b. wt daily for 3-6 successive days.

Tables 5 & 6 and Figs. 1 & 2 revealed that Mirazid efficacy is higher than Albendazole in treatment fascioliasis in cattle for duration of stop shedding eggs is faeces of treated animal until 12^{th} week, and treatment for 6 successive days more effective than 3 days, but found animal no 7 in Table 2 was not responding for treatment and this may be due to fault in prolonged administration of drug or may be due to Mirazid resistance of animal to *Fasciola gigantica*.

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