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EPIDEMIOLOGY & CHEMOTHERAPY OF FASCIOLIASIS IN BUFFALOES

(With 3 Tables & 2 Fig.)

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وبائية وعلاج العدوى بالعدوه الكبديه فى الجاموس

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أجريت الدراسة الوبائية فى عينات الجاموس المذبوح وكذلك الجاموس المصاب اكلينيكيًا بلغت نسبة الاصابه ٦ ر ١٤ % ، ٤ ، و ١٠ % على التوالى . بالنسبه للجاموس المذبوح وجد أن قمة الاصابه كانت فى شهر سبتمبر (٤ ر ٢٥ %) وشهر فبراير (٢ ر ٢٤ %) بينما وصلت نسبة الاصابه الى أدناها (١ ر ٣٥ %) فى شهر مايو فى حين أن أعلى نسبة أصابه فى الجاموس المريض اكلينيكيًا قد سجلت فى شهر يونيه (١ ر ٧٩ %) . سجل الجاموس البالغ أعلى اصابه (٩ ر ٢٠ %) بالمقارنه بالحيوانات صغيرة السن (٤ ر ١٣ %) كما وسجلت الحيوانات الحلابه نسبة اصابه بلغت ٧٠ ر ١٢ % بالمقارنه بغير الحلابه (٢٩ ر ١٨ %) . أظهرت نتائج العلاج أن عقارى ترى كلابندازول والاكسى كلوزانيد كانا ذا كفاءة علاجيه متساويه .

SUMMARY

The epidemiology and chemotherapy of fascioliasis in buffaloes was studied. The epidemiological studies were undertaken in slaughtered and clinically affected buffaloes. The infection rate was 14.6 and 16.04% in slaughtered and clinically affected buffaloes. In slaughtered animals two seasonal peaks were recorded in the months of September and February (25.4% and 24.2%) while the lowest (1.35) being recorded in the month of May. In clinically affected buffaloes, the highest infection rate was recorded in February and October (29.16 30%) while lowest incidence was recorded in June (1.79%). The higher incidence of fascioliasis was recorded in adult buffaloes (20.9%) than youngsters (13.4%) and non lactating (18.29%) than lactating buffaloes (12.70%). The results of therapeutic trials by using triclabendazole and oxclozanide indicated that both these compounds were equally effective in the treatment of fascioliasis.

INTRODUCTION

Fascioliasis is a problem of ruminants which has been encountered throughout the world. Among ruminants, buffalo is the very susceptible animal to this disease by virtue of its habitat, behaviour and physiology (BALASINGAM, 1962) and generally causing chronic and sub-clinical disease. Although acute fascioliasis has been reported in cattle and buffaloes (ROSS et al., 1968) it is rare and thus the need for fasciolicidal drugs effective against immature parenchymal stages of *F.gigantica* and *F. hepatica* has not been considered a clinical necessity. Nonetheless, the immature stages of this parasite can cause liver damage which results in subclinical disease and associated losses of production, such as loss of milk yield and poor weight gain (CHICK, 1980).

Keeping in view the economic importance of fascioliasis, the present study was conducted to determine the epidemiology of infection in an efficient manner under local climatic conditions and thus to treat the affected animals with triclabendazole and oxclozanide at their recommended dose rate. Comparison was also made so as to select the most suitable, effective and economical drug against fascioliasis in Pakistan.

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MATERIAL and METHODS

To record the incidence of fascioliasis, a survey of local slaughter houses was carried out daily during the period from January-December, 1991. The post mortem examination of slaughtered animals was carried out. Livers and bile ducts were examined for the presence of liver flukes. The date of visit, the number of total animals slaughtered, the number found positive for fascioliasis and the age of such animals was furnished.

The seasonal incidence of clinically affected buffaloes was recorded by the routine analysis of faecal samples brought to veterinary hospitals of Raja, Tatlawali and Kamoke (District Gujranwala). Incidence of fascioliasis in relation to age and physiological status was also observed.

Chemotherapeutic trials

Drugs used

The following anthelmintics were used in these studies:

1. Triclabendazole (Fasinex) product of Ciba Geigy Ltd. was administered orally at the rate of 10 mg per Kg. body weight.
2. Oxcyclozanide (Zanil) product of ICI was administered orally at the rate of 10 mg. per Kg. body weight.

A total of 45 buffaloes (age ranged from 1-8 years) were used in these studies. These animals were randomly divided into three groups i.e A, B & C each having 15 animals. Animals in group A & B were given triclabendazole and oxcyclozanide at their recommended dose rate, while no treatment was given in animals of group C. All these animals were kept under similar feeding and managerial conditions throughout the course of study. Faeces were examined on the zero, 3th and 18th day post treatment while the animals which remained positive for fascioliasis were given a second dose of respective drug on 18th day and their faecal egg counts were made on 21st & 28th day post treatment. The effect of anthelmintic on milk yield was determined in each case by measuring the volume of milk before and after treatment. Side-effects of drugs, if any, were also recorded.

Parasitological techniques:

Flukes from each of the infected animals were recorded by the methods described by ROSS *et al.* (1966) and SOULSBY (1982). the faecal samples were examined by direct smear and sedimentation technique and the eggs were identified on the basis of morphology (YAMAGUTI, 1975). Eggs per gram of faeces

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of individual animal was made by McMASTER egg counting technique (KELLEY, 1974).

RESULTS

During the one year study period (i.e from January-December, 1991) 1838 slaughtered and 2088 clinically affected buffaloes were examined, of which 14.6% and 16.04% slaughtered and clinically affected animals were harbouring *F. gigantica* and *F. hepatica*. The overall infection rate in both the groups of animals was 15.36% (Table 1).

Monthwise Incidence:

Monthwise incidence of fascioliasis in buffaloes is shown in Table 1. During the period under study, the highest incidence of fascioliasis in slaughtered animals was recorded in the month of September and February with the infection rate of 25.4 and 24.2% respectively. The lowest incidence was recorded during the month of May being 1.35%. In clinically affected buffaloes, the incidence of fascioliasis increased gradually from the month of July to October. The highest incidence of fascioliasis (30%) was recorded in October while lowest 1.79% was recorded in June (Table 1). Next to highest, the incidence was also recorded in the month of February (29.16%) (Table 1).

Seasonwise incidence:

The highest infection in both the slaughtered and clinically affected buffaloes were noted in Autumn season i.e 20.6 and 24.7%. While the lowest in summer i.e. 4.2% and 7.4%. It was also established that chronic form of disease is found in spring. The level of disease remained very low in spring (Fig.1).

Incidence/in relation to physiological status:

In clinically affected buffaloes the incidence is more in adult buffaloes (20.9%) than youngsters (13.4%) below two year of age. The incidence of infection is more in non-lactating (18.29%) than lactating buffaloes (12.70%) (Table I)I.

Chemotherapeutic trials:

The results of therapeutic trials are given in table III. The efficacy of the drug was calculated on the basis of reduction in faecal egg count.

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After the first treatment, the efficacy increased with the passage of time and on the 18th day it was 87 and 86.2% in the case of triclabendazole and oxclozanide respectively. The efficacy further increased after the second treatment and on 28th day it was 100% in the case of both the drugs i.e. triclabendazole and oxclozanide.

For a few days after treatment, there was some reduction in milk production. However milk yield increased continuously until the end of trials. An increase of 25 and 30% was observed in the case of triclabendazole and oxclozanide respectively (Fig. 2).

None of the drugs used showed any untoward effects on tested buffaloes. The whole general body condition of the animals improved gradually after treatment.

DISCUSSION

In the present study, epidemiological data on fascioliasis were collected in the slaughtered and clinically affected buffaloes. It was observed that highest incidence i.e. 24.4 and 30% was observed in the months of September and October in slaughtered and clinically affected buffaloes respectively. OLLERENSHAW (1958) reported that there are two most important factors influencing the incidence of fascioliasis i.e. temperature and moisture for they affect the hatching of fluke ova, the viability of encysting cercariae and the population of snails. In Pakistan the rainy season starts in the month of July and changes the environmental temperature and humidity so as to favour the emergence of cercariae from snails. Due to this, metacercariae may show their existence in July after the ingestion which produces the fascioliasis in animals. This assumption appears to be the reason for the high incidence of fascioliasis in September and October (Autumn season). Although rains were recorded during the months of December and January, the incidence of fascioliasis was also recorded during the month of January-February (Post winter months). The results of present study are in line with those of OSBORNE (1958); ANWAR & CHAUDHRY (1984) and HAYAT et al. (1986).

The incidence of the disease in respect to the physiological status of buffaloes revealed a higher infection rate in older buffaloes than youngsters. These findings are in line with those of SOESETYA (1975) and AL-BARWARI (1977). The reason might be relaxation of resistance in faulty management environmental factors at parturition.

A higher infection was observed in non lactating buffaloes than lactating ones, the reason for which seems to be related more to the social practice of keeping lactating animals under

better management and feeding conditions in comparison to non lactating animals which are generally being let loose to graze freely in pastures.

The therapeutic efficacy of Triclabendazole and Oxcyclozanide was compared on the basis of reduction in egg counts after treatment. Triclabendazole and Oxcyclozanide were 100% effective in the 28th day post treatment, Similar results have been recorded by other workers.

RICHARDS et al. (1990), RAPIE et al. (1988), QUIROZ et al. (1988) found that triclabendazole was 100% effective when given in two dosage at an interval of 18 day. MAQBOOL and IRFAN (1983), CHOWARIEC et al. (1970) observed that Oxcyclozanide was 100% effective.

There was 30% increase in milk yield in case of Oxcyclozanide and 25% in the case of Triclabendazole in these studies. MAQBOOL and IRFAN (1983), FOREYT and TODD (1974) also recorded similar results.

These drugs were safe to administer even to pregnant animals as was also observed by JONES (1966), MAQBOOL and IRFAN (1983) in the case Of Oxcyclozanide and QUIROZ et al. (1988) in the case Triclobendazole. However, the general body condition gradually improved in all the cases, as the animals became free of parasitic burden.

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TABLE - I
 Monthwise incidence of Fascioliasis in buffaloes

Month	Incidence in slaughtered animals			Incidence in clinically affected animals			Over all incidence
	No. of animals examined	No. of infected animals	%age infection	No. of animals examined	No. of animal positive for Fascioliasis	%age infection	
January	120	26	21.6	182	39	21.4	21.52
February	140	34	24.28	192	56	29.16	27.10
March	150	20	13.3	140	20	14.2	13.7
April	126	15	11.9	180	15	8.3	9.8
May	148	2	1.35	162	5	3.06	2.25
June	146	3	2.05	167	3	1.79	1.91
July	129	6	4.65	170	17	10	7.69
August	141	8	5.67	183	19	10.38	8.33
September	181	46	25.41	176	39	22.15	23.8
October	172	38	22.09	160	48	30	25.9
November	180	35	19.4	196	38	19.38	19.4
December	170	30	17.6	180	31	21.11	19.42
	1803	263	14.6	2088	335	16.04	15.36

TABLE-II
 Incidence of Fascioliasis in buffaloes in relation to physiological status

Parameters	Total number of animals	A G E		Phase of lactation	
		Young under 2 year	Adult over 2 year	Lactating buffaloes	Non lactating buffaloes
No. of animals observed	2088	816	1072	842	1246
No. of animals infected	335	110	225	107	228
Rate of infection	16.04	13.4	20.9	12.70	18.29

TABLE-III
 Comparative efficacy of Triclabendazole and Oxyclozanide against Fascioliasis

Drug used	Dose rate	Efficacy in percentage after single dose			Efficacy in percentage after second dose	
		3rd day	7th day	18th day	21st day	28th day
Triclabendazole	10mg/kg body wt.	45.8	62.6	87	94.3	100
Oxyclozanide	10mg/kg body wt.	47.8	62.8	86.2	95.7	100

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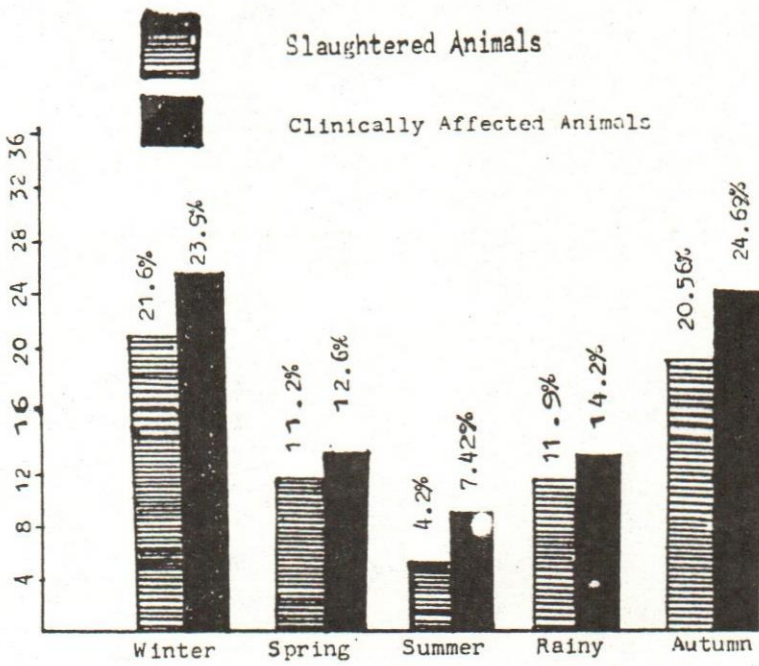


Fig-1 Seasonwise incidence of fascioliasis

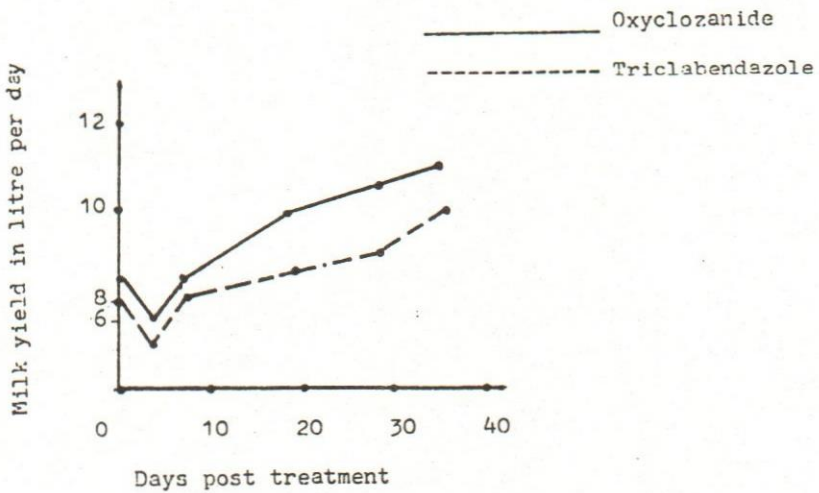


Fig-2 Milk yield of buffaloes treated with Oxyclozanide & Triclabendazole