

SOME STUDIES ON INTERNAL PARASITES OF CATTLE

EL SAYED, M.M.

Department of Medicine, Infectious and Fish diseases , Fac. of Vet. Med. Cairo University.

SUMMARY

In the present study, 116 cattle calves aged between 6-12 m. old showed clinical signs varied from anorexia, to weight loss, diarrhea, anaemia and submandibular oedema were investigated for helminthiasis. Only 13.7% of the faecal samples were positive for strongyle eggs with a mean EPG of 240. Mixed infection with *Fasciola* was observed in 8.6% of cases (10 out of 116). Most of the recovered larvae from faecal culture were *Ostertagia* spp., followed by *Trichostrongylus* spp. and *Cooperia* spp.

Estimation of pepsinogen level of 26 animals including the infested one showed significant increase.

* Anthelmintic treatment using Ivermectin plus clorsulon or Albendazole revealed that both drugs were highly effective against adult and developing stages of parasitic gastro-enteritis as well as *Fasciola* infestation.

INTRODUCTION

Although gastrointestinal parasitism in cattle may be due to several species, the abomasal nematodes *Ostertagia ostertagi*, *Haemonchus placei* and *Trichostrongylus axei* are undoubtedly the most pathogenic and economically important helminths (Fahmy, 1980; Chaudhry et al., 1984).

Clinical and Subclinical diseases caused by parasitic affections of domestic livestock remain one of the biggest causes of economic loss in animal production throughout the world (Ezzat et al., 1994).

Changes in the abomasal physiology and pathology including significant increase of serum pepsinogen level were produced by massive infection of adult or inhibited larvae of *Ostertagia* spp. and *Haemonchus* spp. (Armour, 1970 and Chiejina 1977).

Mixed infections of gastrointestinal nematodes and the major trematodes *Fasciola hepatica* or *F. gigantica* were commonly seen in many field cases. Reid et al. (1967) and Armour (1970) reported outbreaks of type II *Ostertagiosis* where a fulke is a complicating factor. These observations promote the production of many modern broad spectrum anthelmintics most of them are effective against all the developing larval stages and adult of strongylidae species besides its fasciolicidal effect. Albendazole and Ivermectin plus clorsulon are newly introduced fasciolicidal drugs which have been reported effective against liver fluke, lung worms and gastro intestinal nematodes of calves (Theodorides et al., 1976, Abdel-Rahman et al. 1992 and Hamoda et al., 1994).

The present study records the prevalence of some internal parasites in cattle using the conventional methods as well as estimation of serum pepsinogen level and a comparative trial on the

anthelmintic effect of albendazole and Ivermectin plus clorsulon.

MATERIAL AND METHODS

* Animals:

In this study 116 cattle calves aged between 6-12 months were investigated for helminthiosis. Animals were examined clinically and the observed signs were recorded.

* Parasitological examination:

Faecal samples were collected and examined microscopically using the concentration flotation and sedimentation techniques according to Soulsby (1968). The degree of infestation was recorded by counting the parasitic eggs using the modified Mc Master technique according to Burger and Stoye (1968).

Identification of Fasciola eggs was based on the morphological characteres as described by Yamaguti (1975) and Fasciola egg count by using the quantitative fecal sedimentation technique of Dennis et al. (1954).

Faecal culture and larval differentiation were carried out according to the methods developed by Eckert (1960) and Okpala et al. (1977).

* Estimation of plasma pepsinogen level:

Was done according to the method described by Jennings et al. (1966), using bovine serum albumin as a substrate.

*Anthelmintics:

- Albendazole: Spanish Co. 5% drench.
- Ivomec super: MSD Agvet, division of Merek-Sharp, 1% w/v ivermectin and 10% w/v

clorsulon in a sterile solution of s/c injection.

* Therapeutic regimes:

Animals used in this trial were divided into two groups as follows:

Group I : Consisted of 116 cattle calves which have been proved to be infected with parasitic gastro enteritis.

These animals were divided into two subgroups, each of eight animals and given Albendazole as a single oral dose of 3 mg/kg b.w. and ivermectin (200 ug) clorsulon (2 mg), once at a dose rate of 1 ml/50 kg.b.w.

Group II: Comprised 10 cattle calves naturally infected with fascioliasis and showing significant increase in serum pepsinogen level. These animals were also divided into two subgroups 5 each and given the two anthelmintics by the same manner as in group 1.

All animals were kept under similar management condition throughout the course of the study. Faeces were examined on zero, and 21st day post treatment for the presence of nematodes and fasciola eggs as mentioned before.

Plasma pepsinogen level was also estimated in all calves in both groups before and after treatment. Also, disappearance of signs and clinical improvement were recorded.

RESULTS

Data presented in Table (1) show that 13.7% of cattle calves harboured strongyle eggs with an average of 240 E.P.G. while only 8.6% of cases were passing Fasciola eggs in their faeces.

The clinical signs recorded varied from weight loss, profuse watery diarrhea which has a characteristic bright green colour in calves with strongyle eggs.

In *Fasciola* infected group, anaemia, submandibular oedema besides diarrhea were the main observed clinical signs.

Culture of eggs revealed the presence of different species of *Ostertagia*, *Trichostrongylus* and *Cooperia* larvae reaching a percentage of 68.75%, 18/75% and 12/5% respectively (Table 2). Mixed infection with one or more species was generally noticed in almost all instances.

Estimation of plasma pepsinogen level in both groups before treatment demonstrated a slight

increase in group 1 with a range of 2400-2800 mu. of tyrosine while in calves with fascioliasis a marked rise reaching a range of 3650-4000 mu. was noticed.

Albendazole drench suspension as well as Ivermectin plus clorsulon by s/c injection reduced mean fasciola burden as well as adult and inhibited larvae of strongyle species by 4.2% and 0% and 6.0% and 0% at the dose level of 10 mg/kg and 200ug/kg respectively.

The same drugs at the same doses also reduced the faecal egg counts of *Ostertagia*, *Trichostrongylus* and *Cooperia* species by 21 days post treatment, plasma pepsinogen level decreased in both groups 21 days post anthelmintic treatment (Table 3 and Table 4).

Table (1): Prevalence of internal parasites in cattle calves using fecal egg count:

Number of examined animals	P G E			Fasciola		
	No. of infested	%	E P G	No. of infested	%	E P G
116	16	13.7	240	10	8.6	20.1

Table (2) :

Results of fecal culture and larval differentiation :

Number of cultured samples	Ostertagia spp.		Trichostrongylus + Ostertagia spp		Cooperia + Ostertagia spp.	
	11	68.75	3	18.75	2	12.5
16						

Table (3) :

Efficacy of Albendazole and Ivermectin plus closurolon

for treatment of PGE in cattle calves

Drug Used	Fecal Egg Count		Plasma Pepsinogen Level (mu)	
	before treat.	after treat.	before treat.	after treat.
Albendazol	240	0	2800	1500
Ivermectin plus Closurlon	240	0	2400	1600

Table (4) :

Efficacy of Albendazole and Ivermectin plus closurolon

for treatment of Fasciolosis & developing Larvae of P G E

Drug Used	Fecal Egg Count		Plasma Pepsinogen Level (mu)	
	before treat.	after treat.	before treat.	after treat.
Albendazol	20.1	4.2	4000	860
Ivermectin plus Closurlon	20.1	6.0	3650	800

DISCUSSION

Parasitic infestations are considered as a serious problem of animal industries in many countries of the world as they are only a direct cause of certain diseases but also adversely affect the general condition of infected animals and predispose them to other diseases.

In this study 116 cattle aged 6 months up to 12 months were used to study the prevalence of parasitic infestation not only by the conventional methods but also, with a new diagnostic technique. Data presented in Table (1) show that 16 cattle calves out of 116 harboured helminths eggs with a prevalence rate of 13.7%.

Comparable results were recorded by Hassan (1985) in Benisuef and Salem (1988) in Sharkia who reported that cattle are more susceptible to nematode infestation.

It was noticed that eggs of members of trichostrongylidae were the common types passed from the investigated animals (13.7%) followed by Fasciola eggs (8.6%).

Nearly similar findings have been reported by Hassan (1985) who mentioned that parasitic gastroenteritis is primarily a disease of young stock due to lack of previous exposure and subsequently no acquired resistance has been developed.

On the other hand, the lowest infection rate by Fasciola spp. among cattle at the same age group has been recorded by many authors in Egypt (Ayoub, 1983 and Salem et al., 1990) who found that cattle are less susceptible to fascioliasis than sheep and buffaloe and attributed this to its habitat and little exposure to intermediate snail hosts.

Culture of eggs revealed the presence of different species: Ostertagia, Trichostrongylus and

Cooperia larvae reaching a percentage of 68.75%, 18.75%, and 12.5% respectively. Mixed infection with one or more species was generally noticed except in Ostertagia spp. where 68.75% of faecal samples showed pure infection. Similar species have been identified from cattle calves by Chaudhry et al. (1984) who observed that Ostertagia and Trichostrongylus were the predominant abomasal nematodes in cattle calves.

In this work the clinical signs of calves infected with either Fasciola or nematodes are in agreement with the observations of Amin (1972), Hassan and El-Bahi (1992). Anderson et al. (1965), Reid et al. (1966) attributed diarrhea, anaemia and submandibular oedema to the direct effect of the emerged parasite pest or through its cytolytic action on the gastric epithelium producing loss of parietal cells with a subsequent rise of abomasal pH and an increase in the numbers of viable bacteria and of leakage of plasma albumin into the abomasum.

In a pilot study on the estimation of pepsinogen level of infested animals, our results clearly indicate a marked correlation between clinical signs and level of plasma pepsinogen.

The high rise of pepsinogen level in group of animals infected with fasciola alone may be ascribed to type II Ostertagiosis which coincides with maturation of inhibited larval population. A finding which is in agreement with Armour (1970), Seleman et al. (1976) and Chiejina (1977) who conclude that increased plasma pepsinogen level correlates with the period of marked histological changes in the abomasum following infection with Oestertagia ostertagi and considered this as a sensitive indication of the progression of the ostertagiosis lesion.

Moreover, Reid et al. (1967) reported on the so called fascioliasis/Ostertagiosis complex where outbreaks of type II Ostertagiosis were seen

during March to May with fluke as a complicating factor.

In Egypt, similar high incidence rate of *Fasciola* infection in cattle during the same months has been mentioned by Ayoub (1983) and Salem et al. (1990).

Regarding the anthelmintic effect of Albendazole or Ivermectin plus clorsulon, results obtained from tables (3 and 4) proved the broad spectrum activity of both drugs against the adult stage of Trichostrongylidae and *Fasciola* spp. The criteria of evaluation were the disappearance of *Fasciola* and Strongyle eggs from infested animals by day 21 post treatment as well as abolished clinical signs.

Similar efficacy has been recorded by Salem et al. (1990), Ismail et al. (1990) and Hamoda et al. (1994) with Ivermectin plus clorsulon and Courtney et al. (1986) and Kumar and Pachauri (1989) with Albendazole. The efficacy of both drugs against developing and arrested larval stages was also demonstrated by return of normal abomasal function evaluated by significant decrease of pepsinogen level 21 days post treatment (Tables 3 & 4) with a concomitant return of appetite and resumption of weight gain.

Comparable results of both drugs on inhibited larval stages of abomasal nematodes were recorded by Forbes and Dagleish (1993) for Ivermectin plus clorsulon and Theodorides et al. (1976) for Albendazole.

REFERENCES

- Abdel-Rahman, M.S., Omar, H.M., El-Bahi, M.M. and Ramadan, E.I. (1992): Fascioloicidal effect of Ivomec-F against immature *Fasciola gigantica* in experimentally infested buffalo calves. Proc. 2nd . cong. Fac. Vet. Med. Cairo Univ.: 23-25.
- Armour, J. (1970): bovine Ostertagiasis: A Review. Veterinary Record 184-189.
- Amin, M.M. (1972): Some studies on fascioliasis in cattle and buffaloes in Egypt. Thesis, M.V.Sc., Fac. Vet. Med., Cairo Univ.
- Anderson, A.; Amour, J.; Jarret, W.F.H.; Jenings, F.W.; and Urguhart, Q.M. (1965): A field study of parasitic gastritis in cattle. Vet. Rec., 77, 1196-1204.
- Ayoub, A.A.M. (1983): The interpretation of different tests used for estimation of parasitic state of *F. gigantica* in Gharbia Governorate. Thesis, M.V.Sc., Fac. of Vet Med., Cairo Univ.
- Burger, H.J. and Stoye, M. (1968): Parasitologische Diagnostik (Eizählung und Larven-differenzierung). Therapogen Praxisdienst, 3, 1-22.
- Chaudhry, N.I.; Durrani, M.S. and Aziz, T. (1984): The incidence of gastrointestinal parasites in buffaloes and cattle of Azad kashmir. Pakistan Vet. J., 4, 60-61.
- Chiejina, S.N. (1977): Plasma pepsinogen levels in relation to Ostertagiasis in adult cattle. The Veterinary Record, 5; 120.
- Courtney, C.H., Greiner, E.C., and Whitten, R.D. (1986): Efficacy of an Albendazole feed formulation against bovine G.I. Nem including arrested larvae of Ostertagia. Ostertagi. Am. J. Vet. Res., 47: 119-122.
- Dennis, W.R.; Stone, W.M.; and Sanson, L.E. (1954): New Laboratory and field diagnostic test for fluke ova in feces. J. Am. Vet. Med. Assoc. 124:47-50, 1954.
- Eckert, J. (1960): The diagnosis of gastro intestinal strongylosis by differentiation of the free-living third stage larvae. Z. Vet. Med., 94, 621-629.
- Ezzat, E.A., Moussa, A.A. Eid, R.S.A. ad Ashour, A.A. (1994): Control of Fascioliasis. General Veterinary Organization for Veterinary Services, Dokki, Egypt.
- Fahmy, M.A.M. (1980): Parasitic infection among calves in Egypt. Assiut Vet. Med. J. 7, 21-23.
- Forbes, A.B. and Dagleish, R. (1993): Ivomec super injection for cattle. Areview. J. Egypt. Vet. Med. Ass. 53 (1-2): 355-359.
- Hamoda, F.K.; Hassan, H.Y.; El-Komy, A.A. and Khadiga K. Gamal (1994): Comparative clinical efficacy of Ivomec Super and dovenix against chronic ovine fascioliasis. Assiut Vet. Med. Ass. (1994).

- Hassan, M.G. (1985): Epizootological examination of gastrointestinal nematodes of cattle and buffaloes in Benisuef Gov. M.V.Sc. Thesis, Cairo Univ., Benisuif.
- Hassan, M.G.; and El-Bahi, M.M. (1992): Comparative study on enteric parasites infesting farm and field cattle and buffaloes at Suez Governorate. Assiut Vet. Med. J., 1992, 27, 88-98.
- Ismail, M.; El-Sheikh, A.; Abdalla; M.A.; and Mahmoud, A.A. (1990): Clinical evaluation of the anthelmintic activities of Ivermectin against *G. nematodes* and *Fasciola* mixed infection J. Drug. Res. Egypt 19: 173-180.
- Jennings, F.W.; Armour, J.; Lawson, D.D.; and Roberts, R. (1966): Am. J. Vet. Res. 27; (1), 249.
- Kumar, P. and Pachauri, S.P. (1989): Efficacy of Albendazole against *Fasciola gigantica* infection in buffalo with Particular referece to Milk Production. J. Vet. Parasitology, 3, (1) 1989: 35-39.
- Okpala, I.; Ikeme, M.M. and Kike, S.I. (1977): The identification of the infective larvae of some Strongylate nematode parasites by faecal culture Mmehod. Bull. Anim. & Health production in Africa, 132-141.
- Reid, J.F.S., Armour, J., Jennings, F.W., Kirk Patrick, K.S., and Urquhart, G.M. (1967): Vet. Rec. 80, 371.
- Salem, G.M.M. (1988): Some studies on nematode infestation in fattening calves in Sharkia and Dakahlia governorates. M.V.Sc. Thesis, Zagazig University.
- Salem, A.A.; Shawkat, M.E.; El-Seify, M.A. and Khateib, A. (1990): Incidence and seasonal prevalence of foscioliasis in Benissuef, Egypt. Assiut Vet. Med. J., 22 (44): 62-66.
- Selman, I.E.; Reid, J.F., Armour, J. and Jennings F.W. (1976): Vet. Record. 93: 14.
- Soulsby, E.J., (1968): Helminths, Arthropods and Protozoa of Domesticated Animals. Monning's Vet. & Entomol., 6th ed., The Williams & Wilkins Co., Baltimore.
- Theodorides, V.J., Cyurik, R.J. and; Kingsbury, W.D. (1976): Anthelmintic activity of Albendazole aganst Liver Flukes, Tapeworms, lung, and gastrointestinal roundworms. Experimentia 32:702.
- Yamaguti, S. (1975): A synoptical Review of life Histories of Digenetic Trematodes of vertebrates with special Reference to the morphology of their Larvae. Keigoku publ. Co. Tokyo., pp. 410-413. .