CLINICO-BIOCHEMICAL EFFECTS OF DIFFERENT ANTHELMINTIC COMBINATION AGAINST COMMON FLUKE INFESTATION IN BUFFALOES

Ranveer Kumar Sinha, Bibha Kumari and Bipin Kumar
Department of Veterinary Medicine
Bihar Veterinary College, Patna – 800014 (Bihar)
Bihar Agricultural University, Sabour, Bhagalpur-813210, India
Corresponding author : ranveervet@rediffmail.com
Received 9-6-2012 Accepted 24-09-2012

ABSTRACT

A study was undertaken on clinico-biochemical status in healthy and naturally infected buffaloes with fasciolosis and its therapeutic management through different anthelmintic combination. TSP, albumin, globulin and A/G ratio were found to be reduced as compared to healthy, whereas SGOT and SGPT were found to be significantly higher in infected buffaloes. Recovery was observed in different clinico-biochemical parameters on treatment with combination of oxyclozanide and albendazole @ 15 mg/kg.b.wt., followed by oxyclozanide + tetramisole and oxyclozanide alone. It is also revealed that apart from chemotherapy, supportive therapy helped in speedy recovery of different biochemical parameters and in gaining normal health after elimination of parasite.

KEYWORDS: Anthelmintic, Flukicidal, Metabolic Activity, Oxyclozanide.

INTRODUCTION

Fasciola gigantica cause extensive damage to hepatobiliary system as well as gastrointestinal disturbances in buffaloes (Soulsby, 1982). Heavy infection also leads to portal cirrhosis and obstructive jaundice. Present communication deals with clinico-biochemical alteration during diseased condition and its therapeutic management with different anthelmintic combination along with supportive drug.

MATERIALS AND METHODS

The trial was conducted on ten healthy buffaloes as control group and 30 naturally infected buffaloes of either sex, affected with fasciolosis as treatment group. Animals were randomly divided into three groups (T_1, T_2 and T_3). After blood collection serum was separated and total serum protein (TSP), albumin, globulin and albumin-globulin ratio (A/G) were estimated by Biuret's method as described by Coles (1974). Aspartate amino transferase (SGOT) and alanine amino transferase (SGPT) were carried out as per method described by Reitman and Frankel (1970). Rectal temperature, pulse rate and respiration rate were also recorded in both healthy and infected buffaloes before treatment. Animals of group T_1, T_2 and T_3 were treated with Oxyclozanide @ 10 mg/kg.b.wt., Oxyclozanide + Tetramisole (1:1) @ 20 mg/kg. b.wt. and Oxyclozanide + Albendazole (1:0.5) @ 15 mg/kg. b. wt. orally in respective groups. All the animals treated with single dose of anthelmintic were also treated with 5% DNS, Nutriliv Inj., Imferon Inj. and Neblon powder @ 1-3 bottle i/v (depending upon the severity), 10ml i/m, 10ml i/m and 50 gms orally respectively. Subsequently on 12th day of post treatment the efficacy of drug was evaluated for improvement in terms of clinical and biochemical parameters as it were estimated before treatment.

RESULTS AND DISCUSSION

In the present study the most obvious clinical sign observed in affected animals were dullness, weakness, inappetance to anorexia, bottle jaw, pale appearance of conjunctiva, anaemia and persistent diarrhoea.

. Table : Mean ± S.E. and percentage recovery of different clinico-biochemical parameters studied in different treatment group of buffaloes suffering from Fascioliasis.

Parameters	Healthy control groups	Group T_1 (Oxyclozanide)			Group T_2 (Oxyclozanide + Tetramisole)			Group T_3 (Oxyclozanide + Albendazole)		
		BT	AT	% recovery	BT	AT	% recovery	BT	At	% recovery
Rectal Temp. (^{0}F)	100.48 ? 0.116	100.38 ? 0.062	100.52 ? 0.095	0.139	100.40 ? 0.021	100.49 ? 0.043	0.089	100.39 ? 0.027	100.49 ? 0.027	0.099
Pulse rate (per min)	52.20^{a} ? 0.359	54.9^{b} ? 0.378	51.70^{a} ? 0.334	5.82	55.20^{b} ? 0.388	51.80^{a} ? 0.359	6.15	55.10^{b} ? 0.378	51.70^{a} ? 0.300	6.17
Respiration rate/min.	24.40^{a} ? 0.266	26.40^{b} ? 0.339	23.80^{a} ? 0.359	9.84	26.30^{b} ? 0.422	23.80^{a} ? 0.359	9.50	26.30^{b} ? 0.422	23.90^{a} ? 0.378	9.12
Total serum protein (g/dl)	7.314^{cd} ? 0.050	5.787^{a} ? 0.028	6.839^{b} ? 0.035	18.17	5.816^{a} ? 0.040	7.079^{c} ? 0.058	21.71	5.875^{a} ? 0.064	7.221^{c} ? 0.044	22.91
Albumin (g/dl)	3.415^{de} ? 0.029	2.418^{e} ? 0.030	3.105^{c} ? 0.035	28.41	2.53^{a} ? 0.040	3.230^{c} ? 0.038	27.66	2.576^{ab} ? 0.043	3.361^{cd} ? 0.031	30.47
Globulin (g/dl)	3.894^{d} ? 0.023	3.370^{b} ? 0.003	3.734^{c} ? 0.006	10.80	3.284^{a} ? 0.005	3.850^{d} ? 0.020	17.23	3.30^{a} ? 0.022	3.861^{d} ? 0.012	17.00
A/G ratio	0.876^{d} ? 0.002	0.717^{a} ? 0.009	0.831^{c} ? 0.009	15.89	0.770^{b} ? 0.012	0.838^{c} ? 0.316	8.83	0.780^{b} ? 0.008	0.870^{d} ? 0.316	11.53
AST (SGOT) (I.U/L)	62.10^{a} ? 0.355	69.91^{b} ? 0.387	63.07^{a} ? 0.299	9.78	70.38^{b} ? 0.324	62.87^{a} ? 0.281	10.67	69.59^{b} ? 0.338	62.34^{a} ? 0.170	10.41
ALT (SGPT) (I.U/L)	18.01^{a} ? 0.072	18.51^{c} ? 0.055	18.23^{ab} ? 0.058	1.51	18.53^{c} ? 0.055	18.16^{a} ? 0.048	1.99	18.59^{c} ? 0.053	18.07^{a} ? 0.057	2.79

Note : 1. Mean with different superscripts (row wise) differ significantly (P<0.01)

2. % Recovery = $\frac{AT - BT}{BT}$ x 100

3. BT – values before treatment, AT – values after treatment

The mean values of different clinico-biochemical parameters are depicted in Table. The values indicated non-significant decrease in rectal temperature and significant (P<0.01) increase in pulse and respiration rates in infected animal as compared to healthy control group. Decreased metabolic activity in diarrhoeic animals might be responsible for fall in rectal temperature (Chakrabarti, 1994). Whereas anaemia, increased demand of oxygen supply and degeneration of tissues by parasite might be responsible for fast pulse and respiration rate (Radostits *et al.,* 2000) The significant fall in TSP, albumin, globulin and A/G ratio in infected group as compared to control group were in accordance with the report of Prakash and Bano (2009). Radostits *et al.* (2000) and Pal and Dasgupta (2006) observed that hypoalbunaemia usually associated with fasciolosis because of reduced albumin synthesis and due to increased plasma protein leakage into the gut. Upadhay and Kumar (2003) also observed reduction in A/G ratio.

The value of SGOT and SGPT enzymes increased significantly (P<0.01) in infected animal. This might be due to extensive damage to the liver parenchyma, production of hepatotoxins and necrosis of cell (Teleb Doaa *et al*., 2007 and Adama *et al*., 2011).

Post treatment (on 12th days) observation revealed that all clinical parameters and biochemical values restored toward normalacy, but the restoration was found to be optimum in oxyclozanide + albendazole treated group followed by oxyclozanide + tetramisole and oxyclozanide alone. The reason may be attributed that, the combination of albendazole and oxyclozanide produces an additive flukicidal effect. Albendazole have a wide range of action on both larval or adult stages of worms, as it rapidly metabolized to sulphone and sulphoxide which influence mortality of the flukes (Brander *et al.,* 1991). While oxyclozanide uncoupled the oxidative phosphorylation thus depleted the energy of flukes (Booth and Mc Donald, 1982). Tetramisole has no action on flukes, but it has strong nematodicidal properties. Therefore effective fluke mortality on treatment with combination of oxyclozanide + albendazole recorded with quick restoration in all the clinico-biochemical values in present trial.

ACKNOWLEDGEMENT

Authors are thankful to principal, Bihar Veterinary College, Patna for providing necessary facilities for conducting research work.

REFERENCES :

Adama, J. Y.; Ajanusi, O.J.; Chiezey, N. and Lawal, A. (2011). Biochemical responses of yankasa sheep to experimental *Fasciola gigantica* infection in Zaria, Nigeria.*International Journal of Animal and Veterinary Advances,*3(6) :409-415

Booth, H. Nicholas, Mc Donald and E. Leslie (1982). *Veterinary Pharmacology and Therapeutics,* 5th Edition. The low state university press Lowa, U.S.A.

Brander, G.C.; Pugh, D.M.; Bywater, R.J. and Jenkins W.L. (1991). *Veterinary applied Pharmacology and Therapeutics*. Vedn. ELBS. Bailliere Tindall. London.

Chakrabarti, A. (1994). *Textbook of clinical veterinary medicine*. II edn. Kalyani Publishers, New Delhi.

Coles, E.H. (1974). *Veterinary Clinical Pathology*, 2nd Edn., W.B. Saunders Com., Philadelphia.

Pal, S. and Dasgupta, C.K. (2006). Haemato-biochemical profiles of buffalo in anthelmintics treatment against *Fasciola gigantic* infection. Buffalo Bulletin Vol.25 No-2 p.40

Prakash, Ved and Bano, Siddiqui (2009). Clinico-biochemical studies in goats infected with *Fasciola gigantica*. *The Asian Journal of Animal Science*,Vol.4 issue 1: (67-68)

Radostits, O.M.; Gay, C.C.; Blood, D.C.; Hinchcliff, K.W. (2000). *Veterinary Medicine*. 9th edn. A text book of the disease of cattle, sheep, pigs, goats and horse. W.B. Saunders Comp. Ltd., London.

Reitman, S.; Frankel, S. and Sonnewirth, A.C. (1970). *Gradwohl's clinical laboratory methods and diagnosis.* Vol. **I** C.V. Mosby, St. Louis.

Soulsby, E.J.L. (1982). *Helminths, Arthropodes and Protozoa of domestic animals*. 7th edn. The ELBS and Bailliere Tindall, London.

Teleb Doaa F.; Soliman, E. K. and AbdEl-Khalek T.M.M (2007). Effect of Fascioliasis on haemtological, serum biochemical and histopathological changes in sheep. *Egyption J. of sheep and goat science*. Vol2 (2):15-34

Upadhay, A.K. and Kumar, M. (2003). Haemato biochemical alteration in experimental bovine fascioliasis. *Indian J. Vet. Med*. Vol. **23**, No. 2, pp. 66-70.

❑