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EFFECT OF DOVENIX-DEXAMETHASONE COMPINATION ON THE CLINICAL AND LABORATORY FINDINGS OF BOVINE FASCIOLASIS

BY

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INTRODUCTION

Corticosteroids are known to suppress development of local inflammatory reactions, inhibit microscopic changes characteristic of inflammation and later on capillary and fibroblastic prliferation, collagen deposition and still later cicatrization (Copeman, 1970).

Corticosteroid therapy was tried in different human hepatopathies as infectious hepatitis and primary and secondary liver cirrhosis. The results were improvement of the clinical signs, increase body weight, regression of jaundice as well as return of liver function tests to normality (Shoeb et al., 1971).

In veterinary Medicine, liver damage due to fascioliasis is one of the major diseases among ruminants. It results in heavy economic losses either in productivity or reproductivity of the diseased animals. The disease has been subjected to much investigations with development of tremendous number of effective antifasciolal agents. In most cases complete freedom of the flukes can be reached. Unfortunately complete regeneration of the damaged liver does not occur and the previously affected animal remains economically unprofitable for breeding (Bennett, 1980).

In the present work, an antifascilal agent was used with and without a corticosteroid therapy for the treatment of cases of bovine fascioliasis. The aim was to study the effect of such combination on the recovery rate, subsequent clinical picture as well as on the results of liver function tests.

MATERIAL AND METHODS

Fourteen cows infected naturally with liver flukes were used. Their ages ranged from 5 to 8 years. They were suffering from pronounced emaciation, attacks of diarrhoea, pale to icteric mucous membranes and some had oedematous swellings in the dependent parts of the body. The fasciolal nature of the cases was approved by faecal examination where the characteristic eggs were seen. Liver function tests including estimation of serum glucose, albumin, cholesterol, bilirubin, glutamic oxalacetic transaminase activity (S-GOT) and alkaline phosphatase activity (S-AP) were carried out for all cases using reagent test kits*. The animals were then divided into two groups: the first (8 animals), was treated with Dovenix® ** and the other (6 animals, with both Dovinex® and Dexamethasone® ***. The used dose of Dovenix® was 10 mg/kg body weight S/C as one injection and that of Dexamethasone® was 1 mg/ 10 kg body weight I/M every other day for 30 days. After ending of the treatment schedule, the clinical picture of all animals in both groups was assessed, faecal examination was made and the same liver function tests were carried out again. The results were analysed statistically and presented in Table 1.

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RESULTS AND DISCUSSION

The problem of fascioliasis is not the mere presence of the adult flukes in the bile ducts or its premature stages in liver parenchyma of the affected host animal. These can be treated quite effectively by a number of antifasciolal drugs. The real problem lies in the fact that the flukes destroys the hepatic cells and produce autoimmune reactions with setting up of connective tissue formation to replace the acting paranchymal cells. The flukes may also obstruct the major bile ducts causing the eggs to pass proximally to block the smaller bile canaliculi, resulting in inflammation and hyperplasis of thir lining epithelia. Marked hepatic cirrhosis may be associated with fibrosis of the tracts left by migration of the immature flukes, fibrosis of the hyperplastic bile ducts and fibrosis of the entire lobes of the liver (Soulsby, 1968; Baker, 1970; Anmour, 1975; Bennett, 1980). After death of the flukes naturally or artificially, the clinical signs remain simply because the damaged liver is not simultaneously treated.

With regard to the role of dexamsthasone therapy on the recovery rate of the treated cases, it was found that such combination has no determinant effect as all animals after 30 days post-therapy has given negative results with faecal examination.

The clinical picture of the recovered animals in both groups gave unequal results. In the first group where only Dovenix® was used, most animals remained anaemic and showed no improvement of body condition. The bottle jaw which was seen in some animals persisted. From the parasitological point of view, the cows in this group were fasciola free but the clinical picture was not satisfactory. In the second group where Dovenix® and Dexamethasone® were simultaneously used, the clinical picture was much more satisfactory. Signs of anaemia subsides, body condition improved and dropsical swellings disappeared.

The observed improvement of the clinical signs in the second group was simultaneously accompanied with improvement of the results of liver function tests. In the first group, such improvement could also be traced. It was, however, less remarkable as compared with those of the second group (Table 1).

Biochemical analysis of serum samples of both treated groups revealed that the observed hypoglycaemia in the fasciola infected group was not influenced by Dovenix®, while combination of Dovenix® and Dexamethasone resulted in elevation of serum glucose level. This may be due to the effect of Dexamethasone® in stimulating the rate of glyconeogenesis (Martin et al. 1985). With such combination the serum albumin values showed increased tendency towards normalization. The anabolic effect of Dexamethasone® on protein metabolism and the accompanying positive nitrogen balance may be the cause of such an effect (Mullin 1976). The observed hyperbilirubinaemia in fasciola infected cows may be attributed to obstruction of the bile ducts (Soulsby, 1968, Abdou, 1976). Dexamethasone® appears probably to inhibit the release of more bilirubin into the circulation making its value to return to normality. IT was also found that administration of Dexamethasone® decreases the activities of the hepatic enzymes SGOT and SAP. A finding which reflects the healing properties of Dexamethasone® heapatic cells.

A possible explanation of the obtained results is that corticosteroids inhibit leucocyte accumulation, fibroblastic proliferation and deposition of collagenous fibers at the sites of an inflammatory reaction. They also prevent development of harmful autoimmune responses produced by presence of injurious agents in the body. Corticosteroids has at the same time a sparing effect on various metabolic functions of the liver Sherlock, 1970). Fatty liver syndrome in cows was treated Dexamethason®. The postulated mechanism was that the drug induces

Table 1: Results of liver function tests of faseiola cows before and after treatment with Dovinex^{R} (Group 1) and Dovinex^{R} and Dexamethasone^{R} (Group 2).

	Before treatment	After treatment	
	All cows	Group 1	Group 2
Serum glucose (mg/100 ml)	44.38±11.30	50.35±15.09	56.37±14.84*
Serum albumin (mg/100 ml)	3.08± 0.50	3.19± 0,41	4.56± 0.56**
Serum cholesterol (mg/100 ml)	157.55±21.92	147.54±27.11	160.95±23.31
Serum bilirubin (mg/100 ml)	0.82± 0.23	0.60± 0.20	0.38± 0.12**
S - GOT (U/L)	55.15± 6.75	41.53±12.30*	35.69±10.17**
S - AP (U/L)	23.51± 6.15	19.72± 3.75	14.16± 5.28**

* $P < 0.05$ ** $P < 0.01$.

hyperglycaemia and hypolactia, thus lowering the energy demand on the liver (Whitlock, 1986).

It could concluded that combination of Dexamethasone with fasciolicidal agents is benifecial as it inhibits or at least decreases further damage of liver cells, prevent complications and connective tissue proliferation. The drug must, however, be used with caution as it may decrease body immunity and render the treated animal more susceptible to infection.

SUMMARY

Dexamethasone was given along with Dovenix^{R} to 8 Fasciola infected cows with the aim that complications of the disease might be ameliorated or prevented. The results were encroughing in that such combination led to a better return of the diseased animals to normality than those not given Dexamethasone. The finding of liver function tests were also promising as most of the estimated constituents showed increased tendency towards normalization.

The old fact that corticosteroids prevent inflammation and connective tissue proliferation along with improvement of intermediary metabolism, amy give an explantion of such an effect.

REFERENCES

1. Abdou, O.M. (1976): Clinical studies on liver function tests in buffaloes. M.V.Sc. Thesis, Fac. Vet. Med. Caior University.

2. Armour, J. (1975): The epidemiology and control of bovine Fascioliasis. Vet. Rec., 96, 198.

3. Baker, D.W. (1970): Liver fluke disease. In "Bovine Medicine and Surger". First Ed. by H.E. Amstutz. Am. Vet. Pub., Santa Parbara, Ca. 1970.

4 . Bennett, D.G. (1980): Liver fluke disease. In "Bovine Medicine and Surgery". Second Ed. by H.E. Amstutz. Am. Vet. Pub., Santa Parbara, Ca, 1980.

5 . Copeman, W.S.C. (1970): "Textbook of Rheumatic Diseases". Fourth Ed. E & S. Livingstone. London.

6 . Martin, D.W. Mays, P.A. and Rodwell, V.W. (1985): In "Atarper's Review of Biochemstry". 21th Ed. Lange Medical Publications. Los Altos, California, 245-262.

7 . Mullen, P.A. (1976): Papers and articles: The diagnosis of liver dysfunction in farm animals and horse. Vet. Rec., 99, 330-334.

8 . Sherlock, S. (1970): "Diseases of the liver and Biliary System". Fourth Ed. Blackwell Scientific Publications, Oxford, England.

9 . Shoeb, S.M., Habib, M.A., Basmay, K., Abdel-Hafeez, M. El-Nayal, N. and Mahran, Y. (1971): Effect of corticosteroid therapy on bilharzial liver fibrosis Proc. Afro-Asian Symp. Chemother. Schist., pp. 601-608.

10. Soulsby, E. JJ. L. (1968): "Helminths, Arthropodes & Protozoa of Domestic Animals". Balliere, Tindall and Cassell, London.

11. Whitlock, R.H. (1986): Liver diseases in "Current Veterinary Therapy-Food Animal Practice". Second Ed. by J.L. Howard. W.B. Saunders Co., Philadephia, USA.