PARASITIC DISEASES

Preventative/Prophylactic activity of isometamidium against *Trypanosoma vivax* in experimentally infected cattle in Brazil

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INTRODUCTION

Bovine trypanosomosis is a disease caused by the haemoparasite *Trypanosoma vivax*, which leads to considerable financial losses in cattle herds. The losses occur due to animal mortality, reduced fertility and reduced feed conversion in the herd or the direct loss of daily income due to lower milk production.

OBJECTIVE

This study aimed to determine the preventative/prophylactic activity of a formulation containing isometamidium (Trypamizol® - MSD Saúde Animal) in cattle treated at a dose rate of 1 mg/kg body weight, against an experimentally induce *Trypanosoma (T.) vivax* infection

MATERIALS AND METHODS

- Eighteen healthy cattle, negative for the presence of *T. vivax,* using the Woo, Brener and cPCR techniques, were selected at D-130.
- Animals were divided into three groups of six animals each, based on the body weight measured on Day -121. In each group, treatment with an experimental formulation of isometamidium (Trypamizol® - MSD Saúde Animal) was carried out as follows: Groups T01 and T02 were treated respectively on Days -90 and D-60.
- All treatments were performed by deep intramuscular injection at a dose of 1mg/kg body weight. A control group of 6 animals (Group T03) was included in the study and treated with a saline solution in a way that two different animals from this group were treated on each of the days when treatment was administered to groups T01 and T02. On day 0 of the study, all animals were infected intravenously with a suspension containing 1x10 trypomastigotes of *T. vivax.*

It can be concluded that the product Trypamizol®, administered intramuscularly to cattle at a dose of 1 mg isometamidium/kg body weight, showed 100% prophylactic activity for 90 days against *Trypanosoma vivax* in experimentally infected cattle.

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RESULTS

The results demonstrated that isometamidium (Trypamizol® - MSD Saúde Animal), administered intramuscularly at a dose rate of 1 mg/kg to the calves, was effective as a prophylactic treatment against *T. vivax.* The combination of diagnostic techniques (blood smears, Woo, Brener and cPCR) made it possible to diagnose the presence of *T. vivax* in all calves in the control group. No parasites could be detected in calves from Group T01 and T02 treated with isometamidium at -90 days and -60 days by means of cPCR and the Brener diagnostic techniques **(Fig 1, 2).**

FIGURE 1. Result of PCR for *Trypanosoma vivax* treated with isometamidium at -90 days and -60 days

Parameters (unit)	Number of cattle						Average	SD (±)
	1025	1062	1073	1088	1153	1234		
Lambda_z (1/h)	*	0,06	0,04	0,09	0,29	0,06	**0,11**	0,09
t1/2 (h)	*	11,55	18,13	7,67	2,4	12,54	**10,46**	5,24
T_{max} (h)	1	1	1	1	1	1	**1**	0
C_{max} (µg/L)	229,64	363,04	868,18	552,26	578,25	340,07	**488,57**	208,59
Clast_obs/Cmax	0,24	0,15	0,08	0,1	0,12	0,27	**0,16**	0,07
AUC 0-t (µg/L*h)	399,44	2278,56	4631,8	4092,36	1855,29	4077,28	**2889,12**	1502,03
AUC 0-inf_obs (µg/L*h)	*	3208,59	6366,71	4677,34	2097,43	5750,75	**4420,16**	1580,42
AUC 0-t/0-inf_obs	*	0,71	0,73	0,87	0,88	0,71	**0,78**	0,08
AUMC 0-inf_obs (µg/L*h^2)	*	58110,57	117267,5	53892,97	7987,58	110833	**69618,3**	40366,19
MRT 0-inf_obs (h)	*	18,11	18,42	11,52	3,81	19,27	**14,23**	5,9
Vz/F_obs ((mg/kg)/(µg/L))	*	0,01	0	0	0	0	**0**	0
Cl/F_obs ((mg/kg)/(µg/L)/h)	*	0	0	0	0	0	**0**	0

FIGURE 2. *T. vivax* trypomastigote count quantified in treated calves and control by the Brener technique.

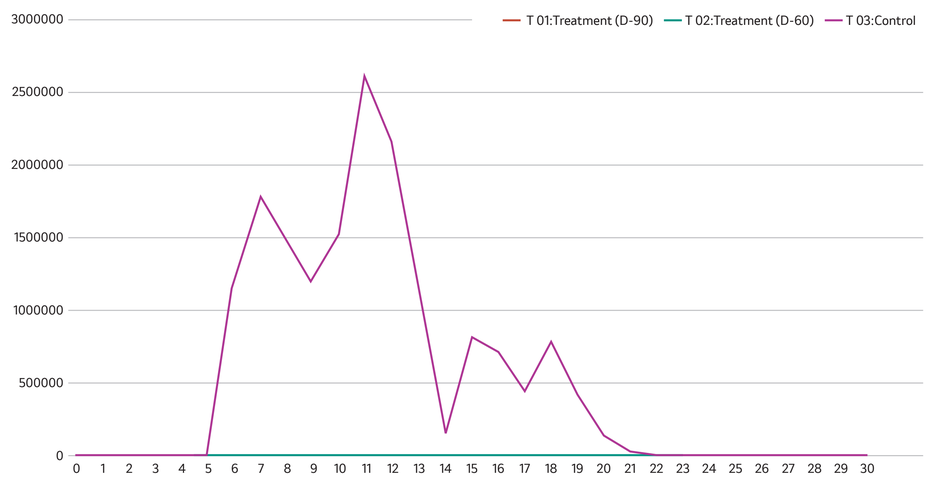

FIGURE 03. Diagnosis of the presence or absence of *T. vivax* detected in treated calves and control by the Woo technique.

Number of Cattle	Treatment	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
47	T 01: Treatment (D-90)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	T 02: Treatment (D-60)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	T 03: Control	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
107		0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
114		0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
117		0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120		0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
121		0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL		0	0	0	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

No parasites could be detected in calves from Group T01 and T02 treated with isometamidium at -90 days and -60 days by means of the Woo diagnostic technique **(Fig 3).**

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