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THE EFFICACY OF THE DRUG EXPRESSTABS® IN CASE OF SARCOPTOSIS OF DOGS

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Abstract. *The aim of the study was to study the efficacy of the drug ExpressTabs® in treating canine sarcoptosis. The studies were conducted on spontaneously infected dogs admitted to the clinic in parallel groups: Group 1 – experimental, the animals were prescribed the test drug ExpressTabs®, Group 2 – control, the animals were prescribed the comparison drug Simparica (Simparica) tablets. The drugs were prescribed according to the instructions for use.*

Results of sarcoptosis treatment: the average percentage reduction in the number of live mites in the experimental and control groups (comparison drug) were 90 and 85. The frequency of successful treatment based on the results of mite elimination in the experimental and control groups were 0.7 and 0.6. The restoration of the coat (average score) in the experimental and control groups was 2.4.

As a result of the conducted clinical and experimental studies, it was found that both drugs ExpressTabs® and Simparica demonstrated high acaricidal efficacy in canine sarcoptosis.

Keywords: *drug, ExpressTabs®, efficacy, sarcoptosis, acaricidal action, dogs.*

Introduction

Among the diseases of small domestic animals, one of the leading positions is occupied by various skin diseases, for example, of invasive etiology. [1].

Sarcoptosis or scabies is a zoonosis caused by mites of the species Sarcoptes scabei var canis. It manifests itself as itching, local skin lesions, and general intoxication. Dogs without clinical signs can be carriers of the pathogen and cause pseudosarcoptosis in humans [2].

Timely preventive measures, competent treatment with modern multicomponent drugs can achieve a positive result in defeating invasive diseases of small domestic animals.

The medicinal product ExpressTabs® (AVZ Ltd, Russia) is complex and multicomponent. It is produced in three modifications, containing as active substances in 1 tablet:

"for dogs weighing 5 kg" - spinosad - 150 mg, praziquantel - 25 mg and moxidectin - 1 mg;

"for dogs weighing 10 kg" - spinosad - 300 mg, praziquantel - 50 mg and moxidectin - 2 mg;

"for dogs weighing 30 kg" - spinosad - 900 mg, praziquantel - 150 mg and moxidectin - 6 mg. Also contains excipients.

Moxidectin belongs to the group of macrocyclic lactones, is active against insects and ticks, as well as larvae and adults of many nematodes. The main target of moxidectin is glutamate-sensitive chloride channels, as well as gamma-aminobutyric acid (GABA) receptors [3-6].

Praziquantel is a pyrazinoisoquinoline derivative and has a pronounced effect against cestodes and trematodes. It increases the permeability of the parasite's cell membranes for calcium ions (Ca2+), causes membrane depolarization, causes the death of the parasite and promotes its elimination from the animal's body [7,8].

Spinosad is a systemic insecticide and contains two main components: spinosyn A and spinosyn D, obtained from Saccharopolyspora spinosa bacteria. It activates nicotinic acetylcholine receptors (n-cholinergic receptors) of the ectoparasite, which causes the death of the insect [9-11].

Objective of the study: to study the effectiveness of the drug ExpressTabs® in canine sarcoptosis. Materials and methods

The studies were carried out in accordance with the Order of the Ministry of Agriculture of the Russian Federation dated March 6, 2018 N 101 "On approval of

the rules for conducting a preclinical study of a medicinal product for veterinary use, a clinical study of a medicinal product for veterinary use, a study of the bioequivalence of a medicinal product for veterinary use".

The studies were conducted on spontaneously infected dogs admitted to the clinic. The experiment included 20 dogs (10 males, 10 females, aged 1 to 6 years, weighing from 3 to 40 kg), which were diagnosed with the presence of the Sarcoptes scabei var canis tick. The animals were divided into parallel groups: Group 1 - experimental, the animals were prescribed the test drug ExpressTabs®, Group 2 - control, the animals were prescribed the comparison drug Simparica tablets. The drugs were used according to the instructions for use.

Ticks were counted and the affected areas were recorded on days: -1/0, 2, 7/10, 14, 28 (±2 days). Skin scrapings were made for further microscopic examination and detection of live ticks.

The following parameters were assessed for each animal:

- Body areas with erythematous papules;
- Body areas with follicular casts, crusts and scales (c – crusts, s – casts, h – scales);
- Body areas with hair loss (1 – slight sparseness of hair, 2 – significant hair loss, 3 – no hair).

The presence or absence of itching was recorded over a 5-minute period.

The absence of live mites was considered a successful treatment result. The decrease in the number of live mites for animals of all groups on each day of assessment was also calculated in accordance with standard formulas.

$$\textbf{Percentage reduction} = 100 \times \frac{Mc - Mo}{Mc}$$

where Mc – the average number of live ticks in animals of the control group at a given point;

M_O – average number of live ticks in animals in the experimental groups.

The proportion of the total number of animals in each of the three groups (frequency of successful treatment) was calculated as follows:

$$\textbf{Success rate of treatment } (A) = \frac{\text{number of animals without live ticks}}{\text{total number of animals}}$$

Efficacy in the groups was calculated by calculating the failure rate in each treatment group:

Failure Rate (B) = 1 – A.

$$\textbf{Efficacy (\%)} = (1 - BO \div BC) \times 100$$

where BO is the failure rate in the experimental group;

BC is the failure rate in the control group.

A semi-quantitative assessment of hair regrowth was performed, and each animal was assigned a score on different days of the post-treatment assessment. The

groups were compared using descriptive methods using frequencies and percentages: 1 point – hair restoration on 0–50% of skin damage sites noted during the pre-treatment assessment; 2 points – hair restoration on >50% – ≤90% of skin damage sites noted during the pre-treatment assessment; 3 points – hair restoration on >90% of skin damage sites noted during the pre-treatment assessment.

Statistical processing of the results was performed using standard methods.

Results and discussion

Evaluation of the effectiveness of treatment of dogs with sarcoptosis

The symptoms revealed during the visit to the clinic and the results of the doctor's examination of animals of the experimental group 1 (ExpressTabs®) and the control group 2 (comparative drug Simparica) are presented in Tables 1-2.

Table 1.

The presence of clinical symptoms before treatment and after taking the drug in the experimental group 1 (ExpressTabs®)

Animal		Inspection days	Symptoms after treatment						
№	Nickname		itching	erythematous papules	casts	crusts	scales	hair loss	number of mites in scraping
1	Tera	0	+	+	+	+	+	+	10
		2	+	+	+	+	+	+	11
		7/10	+	-	+	-	-	+	6
		14	-	-	-	-	-	+	5
		28	-	-	-	-	-	-	0
2	Loki	0	+	+	+	+	-	+	9
		2	+	+	+	+	+	+	5
		7/10	+	-	-	-	-	+	5
		14	-	-	-	-	-	+	0
		28	-	-	-	-	-	-	0
3	Hans	0	+	+	+	+	+	+	10
		2	+	+	+	+	+	+	11
		7/10	-	-	+	-	-	+	6
		14	-	-	-	-	-	+	5
		28	-	-	-	-	-	-	0
4	Patrick	0	+	+	+	-	-	+	6
		2	+	+	-	+	+	+	5
		7/10	-	-	-	-	-	+	0
		14	-	-	-	-	-	+	0
		28	-	-	-	-	-	-	0

5	Tina	0	+	+	+	+	+	+	14
		2	+	+	+	+	+	+	10
		7/10	-	+	+	-	-	+	5
		14	-	-	-	-	-	+	0
		28	-	-	-	-	-	-	0
6	Chara	0	+	+	+	+	+	+	16
		2	+	+	+	+	+	+	8
		7/10	-	-	-	-	-	+	2
		14	-	-	-	-	-	+	0
		28	-	-	-	-	-	-	0
7	Shin-gen	0	+	+	+	-	-	+	5
		2	+	+	-	+	-	+	2
		7/10	-	-	-	-	-	+	0
		14	-	-	-	-	-	-	0
		28	-	-	-	-	-	-	0
8	Dima	0	+	+	+	+	+	+	13
		2	+	+	+	+	+	+	10
		7/10	-	+	+	+	-	+	4
		14	-	-	-	-	-	+	2
		28	-	-	-	-	-	-	0
9	Belka	0	+	+	+	+	+	+	14
		2	+	+	+	+	+	+	9
		7/10	-	+	+	+	-	+	3
		14	-	-	-	-	-	+	1
		28	-	-	-	-	-	-	0
10	Vita	0	+	+	+	+	+	+	10
		2	+	+	+	+	+	+	10
		7/10	-	+	+	+	+	+	3
		14	-	-	-	-	-	+	1
		28	-	-	-	-	-	-	0

(c – crusts, s – casts, h – scales); areas of the body with hair loss (1 – slight sparseness of hair, 2 – severe hair loss, 3 – no hair)

Table 2.

Presence of clinical symptoms before treatment and after taking the comparison drug in the control group 2

Animal		Inspection days	Symptoms after treatment						
№	Nickname		itching	erythematous papules	casts	crusts	scales	hair loss	number of mites in scraping
1	Chika	0	+	+	+	+	+	+	12
		2	+	+	+	+	+	+	11
		7/10	+	+	+	+	+	+	7
		14	-	-	-	-	-	+	5
		28	-	-	-	-	-	-	0
2	Livon	0	+	+	+	+	-	+	10
		2	+	+	+	+	+	+	7
		7/10	+	-	+	-	-	+	5
		14	-	-	-	-	-	+	0
		28	-	-	-	-	-	-	0
3	Kazak	0	+	+	+	+	+	+	13
		2	+	+	+	+	+	+	10
		7/10	-	+	+	-	-	+	7
		14	-	-	-	-	-	+	2
		28	-	-	-	-	-	-	0
4	Yuta	0	+	+	+	-	-	+	8
		2	+	+	-	+	+	+	8
		7/10	-	-	-	-	-	+	1
		14	-	-	-	-	-	+	0
		28	-	-	-	-	-	-	0
5	Sonya	0	+	+	+	+	+	+	15
		2	+	+	+	+	+	+	12
		7/10	-	+	+	-	-	+	6
		14	-	-	-	-	-	+	2
		28	-	-	-	-	-	-	0
6	Tolya	0	+	+	+	+	+	+	12
		2	+	+	+	+	+	+	10
		7/10	-	-	-	-	-	+	5
		14	-	-	-	-	-	+	3
		28	-	-	-	-	-	-	0

7	Ba-rane-sa	0	+	+	+	-	+	+	9
		2	+	+	-	+	-	+	4
		7/10	-	-	-	-	-	+	2
		14	-	-	-	-	-	-	0
		28	-	-	-	-	-	-	0
8	Erik	0	+	+	+	+	+	+	14
		2	+	+	+	+	+	+	12
		7/10	-	+	+	+	-	+	6
		14	-	-	-	-	-	+	4
		28	-	-	-	-	-	-	0
9	Azira	0	+	+	+	+	+	+	15
		2	+	+	+	+	+	+	10
		7/10	-	+	+	+	+	+	4
		14	-	-	-	-	-	+	2
		28	-	-	-	-	-	-	0
10	Shek-el	0	+	+	+	+	+	+	11
		2	+	+	+	+	+	+	10
		7/10	-	+	+	+	+	+	5
		14	-	-	-	-	-	+	2
		28	-	-	-	-	-	-	0

(c – crusts, s – casts, h – scales); areas of the body with hair loss (1 – slight sparseness of hair, 2 – severe hair loss, 3 – no hair)

Efficacy was assessed based on the reduction in the number of live mites, elimination of live mites based on their count, and the disappearance of clinical signs and symptoms. The number of live mites before and after treatment is presented in Table 3.

Table 3.

The number of live mites before and after treatment

Groups	Before treatment			After treatment		
	average value	**error of the mean**	**reliability**	**average value**	**error of the mean**	**reliability**
Study drug ExpressTabs®	10,7	3,8	0,1	0	-	-
Comparison drug	11,9	2,6		0	-	

The drug was considered effective if a 100% reduction in the number of live ticks was recorded on the day of the final assessment (day 28) (Table 4).

Table 4.

Evaluation of treatment effectiveness

Groups	Average percentage reduction in live mites	Success rate of treatment based on tick elimination results	Effectiveness of successful treatment based on the results of tick elimination	Success rate of treatment based on clinical symptoms	Efficiency of successful treatment based on clinical symptoms	Restoration of wool cover (average score)
Study drug ExpressTabs®	90	07	100	100	1	2,4
Comparison drug	85	06	91,5	100	1	2,4

The average percentage reduction in the number of live mites in the experimental and control groups was 90 and 85. The frequency of successful treatment based on the results of mite elimination in the experimental and control groups was 0.7 and 0.6.

The restoration of the coat (average score) in the experimental and control groups was 2.4.

No adverse events or negative reactions were recorded during the experiment.

Conclusions

As a result of the clinical and experimental studies, it was established: the average percentage reduction in the number of live mites in the experimental and control groups (comparison drug) was 90 and 85. The frequency of successful treatment based on the results of mite elimination in the experimental and control groups was 0.7 and 0.6. The restoration of the coat (average score) in the experimental and control groups was 2.4. The drug ExpressTabs® showed high acaricidal efficacy in canine sarcoptosis, as well as the comparison drug Simparica. On the 28th day of treatment, the number of parasites was zero.

No adverse events or negative reactions were recorded during the studies.

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