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Mini Review

Development of Methods for the Treatment and Prevention of Disorders of Reproductive Function of Animals because of the Use of Modern Insecticides in Animal Husbandry

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Abstract

The article provides methods of therapy and prevention of reproductive dysfunctions in animals due to the irrational use of modern insectoacaricides.

Keywords: Synthetic peritroid, Esfenvalerate, Reproductive function, Immunomodulator, Antioxidant

Introduction

At present, a number of insecticides are used in Uzbekistan to protect farm animals and poultry from various ectoparasites - carriers of causative agents of dangerous infections and invasions, and more than 80% of them are represented by drugs from the group of synthetic pyrethroids (SP).

Synthetic pyrethroids are distinguished by a wide spectrum of activity against pests, lack of phytotoxicity, a high safety index for humans and warm-blooded animals, low persistence and danger of recommended dosages for the environment and beneficial organisms [1-3,5,10-12,14].

The main advantage of the substances of this group is their high insecticidal and acaricidal activity with a pronounced selectivity of action, which is many times higher than the selectivity of FOS. Therefore, pyrethroids are used in very small quantities - hundreds of grams per hectare. These compounds are unstable, however, when used in agriculture and veterinary medicine, they can get into the environment and cause poisoning of people and animals [1,5,8,16].

This indicates the need for continuous improvement of systems and principles for studying the interaction of ecotoxicants with the body of productive animals during the reproductive cycle, clarifying the molecular nature of violations of the generative function in general, predicting and early diagnosis of their disorders, searching for rational ways and systems of prevention, effective detoxification (pharmacological correction), especially in the direction of increasing immunobiological resistance to chemical anthropogenic impact [21,23,28].

At the same time, it should be noted that there are no effective methods of corrective therapy for these disorders.

In this regard, the main goal of our research was to develop methods of therapy and prevention of violations of the reproductive function of animals due to the irrational use of

modern insectoacaricides in the practice of animal husbandry in Uzbekistan.

Materials and Research Methods

Laboratory animals, rabbits, were used for the study. A synthetic pyrethroid "esfenvalerat" in the form of a 0.03% insecticidal powder (dust) recommended for chemoprophylactic treatment of agricultural animals against ectoparasites was used as a means that has a possible negative effect on the reproductive function of animals.

On the basis of known information about the mechanisms of the toxic effect of pyrethroids on the animal organism, the drugs "Gamavit", "Fosprenil" and "Mexidol" were used as possible means of pharmacological correction of reproductive disorders in animals under the influence of esfenvalerate.

When assessing the possible negative effect of esfenvalerate dust on the reproductive function of rabbits, we were guided by the methodological recommendations developed by I V Sanotsky, V N Fomenko and others; O N Elizarova; N I Zhavoronkov; A A Dinerman; SD Zagolnikov and others [8-10,17,25,29].

The experiments were carried out in 12 sexually mature rabbits (6-7 months, 9 females and 3 males) were divided into three identical groups, 3 females and 1 male in each. For 7 days of mating, all experimental rabbits were injected with Gamavit and Mexidolad repeatedly, intramuscularly at doses of 0.1 ml / kg of live weight, respectively.

Rabbits of the first group (females) during mating and pregnancy were weekly exposed to skin exposure to 0.031% esfenvalerate dust in an amount of 20 g / head. In addition, 0.1 mg / kg of Gamovit and 10 mg / kg of Mexidol were administered intramuscularly to them on a weekly basis.

The use of dust was discontinued after childbirth, and drugs were discontinued after the resulting offspring reached the age of 1 month.

Rabbits of the second group also during the mating period and throughout pregnancy were exposed to cutaneous exposure to peritroid dust at a dose of 20 g / head, but did not receive prophylactic treatment. The experimental rabbits of the third group served as a control, they were not exposed to dust and medicinal preparations for the resulting offspring for a month, observations were made: its number, growth and development, as well as death at different stages of postnatal ontogenesis were taken into account.

Results and discussion

All experimental animals were fertilized, no pathological disorders were observed during pregnancy; the gestation period in rabbits averaged 30-31 days (Table 1, 2, 3), after which they gave the corresponding offspring, some of its quantitative and qualitative indicators are also presented in these tables.

Table 1: Indicators of reproductive function of rabbits in the control group.

No Females	Duration of Pregnancy (days)	Received a Rabbit			From the Obtained Offspring, there are h / w (days)	
		Total	Including:			
			Alive	Dead	20	30
1	30	6	6	-	6	6
2	31	5	5	-	5	5
3	31	3	3	-	3	3
Total	-	**14**	**14**	-	**14**	**14**

Table 2: Indicators of the reproductive function of rabbits with weekly cutaneous exposure and 0.03% dust-esfenvalerate at a dose of 20g / bird.

No Females	Duration of Pregnancy (days)	Received a Rabbit			From the Obtained Offspring, there are h / w (days)	
		Total	Including:			
			Alive	Dead	20	30
4	31	7	6	1	4	4
5	30	5	5	-	5	5
6	31	4	3	1	2	2
Total	-	**16**	**14**	**2**	**11**	**11**

Table 3: Indicators of the reproductive function of rabbits with weekly cutaneous exposure and 0.03% dust-esfenvalerate at a dose of 20g / head and treated with the drugs "Gamavit" and "Mexidol".

No Females	Duration of Pregnancy (days)	Received a Rabbit			From the Obtained Offspring, there are h / w (days)	
		Total	Including:			
			Alive	Dead	20	30
7	31	3	3	-	3	3
8	31	3	3	-	3	3
9	30	6	6	-	6	6
Total	-	**12**	**12**	-	**12**	**12**

As can be seen from the materials of these tables, females exposed during pregnancy to cutaneous exposure to 0.03% dust based on synthetic pyrethroid esfenvalerate at a dose of 20 g / head gave a slightly larger offspring compared to the control and the group of similar females exposed to exposure to dust and treated with "Gamavit" and "Mexidol". However, among the born rabbits from the above-mentioned females, there were two cases of stillbirth (Table 1).

In addition, in the first week after birth, three more rabbits died from the offspring of females not treated with these drugs, which indicates the unfavorable effect of esfenvalerate dust on their reproductive function and the inexpediency of carrying out chemoprophylactic treatments of animals during pregnancy.

The results presented in table 6. indicate a high protective effect of the drugs "Gamavit" and Mexidol "for the reproductive function of females treated with esfenvalerat dust during pregnancy. There was also no negative effect on the growth and viability of the offspring in the early period of postnatal ontogenesis.

Thus, the treatment of animals (rabbits) from various ectoparasites with the use of synthetic pyrethroids during pregnancy has a negative effect, manifested by the appearance of stillborn offspring, a decrease in its survival and low growth dynamics in the early periods of postnatal ontogenesis.

Analyzing the results of the studies, it can be concluded that the chemoprophylactic treatment of animals against parasitic arthropods (ticks, fleas, lice) with pyrethroid esfenvalerate, in dosages and concentrations that do not cause the manifestation of visible clinical symptoms of intoxication, have a negative effect on the pregnant body. The negative effect is manifested in an increase in the incidence of stillbirth and postnatal death of the newly born young, low dynamics of its growth and development.

For the successful correction of these disorders, it is necessary to use T-type immunomodulatory agents (gamavit, polyoxidonium, dimephosphon, etc.) during pregnancy of animals, as well as drugs with antihypoxic, antioxidant, and membrane-protective properties (mexidol, mexidol-vet).

Conclusions

a. Stillbirth among offspring (mice) from females, when exposed during pregnancy to 0.03% dostomesfenvalerate, is 33%, and postnatal death reaches 23%.

b. Stillbirth among offspring (rabbits) from females treated during pregnancy with 0.03% dust based on pyrethroid esfenvalerate averages 12%, and their survival rate in the first 2 weeks of the postnatal period is 78-79% (postnatal death - 21-22%, respectively).

c. To prevent cases of stillbirth and death of offspring in the early periods of postnatal ontogenesis, the use of a natural immunomodulator "Gamavit" and an antioxidant, membrane protector - "Mexidol" is shown. At the same time, "Gamavit" is used during pregnancy weekly, intramuscularly, at doses from 0.05 to 0.1 ml / kg, and "Mexidol" - once every 10-14 days, intramuscularly at a dose of 5 mg / kg of animal weight.

d. The greatest protective effect on the body of pregnant rabbits.

e. During chemoprophylactic treatments with pyrethroids from various ectoparasites (ticks, lice, fleas) the immunomodulator "Gamavit" is provided.

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