THE EFFECT OF ROYAL JELLY ON SPERMATOGENESIS IN RATS WITH ACUTE HEAT STRESS

Krylov V.N., Sokolsky S.S., Krylova E.V.

The use of bees Royal jelly, for the treatment and prevention of men´s sexual dysfunctions, is commonly known in the literature. However, in general, single, phenomenological effects of its use are described for this purpose is usually considered as a biostimulating. The literature is not detected experimental confirmation, the giver of scientific substantiation of this application. In connection with the above, we conducted a study on the effects of Royal jelly on rats spermatogenesis. For the extreme expression functions spermatogenesis violations, we've chosen a situation which certain causes of these violations - acute thermal stress. Literature data indicate the role of the local and general temperature increasing in spermatogenesis. It´s connected the damaging effect of heat with the violation of the young germ cells in the process of division and change in the parenchyma of the testes, up to its degeneration. Excessive temperature impacts can be the result of anatomical pathology, working conditions, feverish conditions that accompany many of infectious processes. In all these states the violation of blood circulation and hypoxia develops inevitably, that is the trigger for the development of pathology at all levels of a spermatogenesis regulation.

Experiments conducted at the Department of physiology and biochemistry of human and animals Nizhny Novgorod State University to them. N.I. Lobachevsky. The study was conducted on 80 mongrel mature rats in the age from 4 months to 1 year, with similar parameters of ejaculate, relevant normal for the species. Scheme of the experiment included groups: the intact animals (1), the control (monitoring) groups with acute heat stress (2) and with feeding of Royal jelly in physiological conditions (3), as well as the group's experience with preventive (4) and therapeutic (5) feeding Royal jelly rats, subjected to thermal stress. We are used the model of acute heat stress created by putting rats in a thermostat with the temperature of +40°C for 30 minutes. Animals of the control (3) and experience (4, 5) groups received native Royal jelly daily by oral for 10 days at a dose of 100 mg/kg. Ejaculate examination was conducted after 1, 7, 14, 30 days after acute heat stress. Ejaculate for the research was obtained by the method of stimulation ejaculation by 2% oxytocin solution administered to male rats intramuscularly in a dose of 0,2 ml. Method is comfortable, emission of semen is very fast through 2-4 minutes, animals behave calmly, that allows to receive

ejaculate without fixation of animals. The number and motility of sperm were studied in a drop of native ejaculate on glass by light microscopy. Sperm with an active forward movement performing oscillatory movements (hypokinesis) and non-motile sperm (akinesis) were treated separately. The obtained data were statistically processed using the Student t-criterion.

In result of studies it was shown that in the intact animals (group 1) during the entire time of the experiment sperm count remained statistically constant, the total number of cells in the average totaled 3,40±0,093million, of them motile gametes - 1,63±0,176 million (47,94%), oscillating - 0,67±0,033 million (19,7%). This testifies to the adequacy of the chosen method of obtaining ejaculate. Feeding Royal jelly to animals (group 3) caused the increase of the number of cells in the ejaculate to 6,38±0,020 million, with the number of motile gametes increased significantly important to 4,17±0,090 million (65,36% of the total), which significantly exceeded the intact animals indicators.In the period 7-30 days of the study observed a further increase in the quantitative indication of the ejaculate to 6,93±0,060 million cells. Therefore, our results confirm the powerful bio-stimulating effect of the native Royal jelly on the reproductive system in physiological conditions.

The effect of high temperature on rats (group 2), which led to a short-term release of gametes with its subsequent oppression (slide 2). During the first day of the study, the number of ejaculate cells increased in comparison with the intact group (slide 2). Total sperm count amounted to 5,20±0,027 million, of them motile gametes - 2,10±0,046 million. However, 7 days later quantitative and qualitative indicators of ejaculate decreased more than in 2 times in rats subjected to heat. The total number of cells decreased to 2,35±0,095 million of them, motile gametes - 0,92±0,326 million and oscillating - 0,67±0,240 million. In the future 14-30 days the number of sperm cells had significantly reduced (slide). Therefore, even a single thermal exposure resulted in a significant inhibition of spermatogenesis animals, after a brief stimulation in the first day (stress response), the restoration of which has not occurred a month after the impact. It was watched a strong protective effect on spermatogenesis in the group of animals who were feed the Royal jelly before the heat stress (group 4). After 1 day after acute heat stress, the total number of ejaculate cells increased significantly to averaged 11,92±0,039 million, of which mobile forms - 2,23±0,045 million, banging - 4,37±0,130 million, or 18,70% and 36.66% respectively. In the period of 7-14 days this protective effect of Royal jelly declined, but remained higher than in

the control group (slide). It was found protective effect of Royal jelly to be more significant in existing violation of spermatogenesis, compared to the prevention. It was showed a significant increase in both the total number of cells in the ejaculate, and the number of mobile and varying forms in the group of animals who Royal jelly fed in the face forward heat stress. In the period from 1 to 7 days after heat stress count increased to 9,34±0,310 million. From them, mobile forms - from 21,08 % to 29,33%, and the wavering from 12,12% to 31,69%. It is important to note that it is the significant increase in the number of sperm in the ejaculate, unlike experience with prevention, was observed throughout the experiment, and 30 day was of 6,74+0,190 million is attributable, that is much higher not only compared to the control, but also to the level of intact animals.
We can conclude on the basis of carried out researches and obtained results that Royal jelly, positively manifested itself in the conditions of such severe stress, as hyperthermia, as a means to stimulate spermatogenesis. Thus, the unique properties of bee Royal jelly confirmed as a universal biological stimulator functions of the animal body.

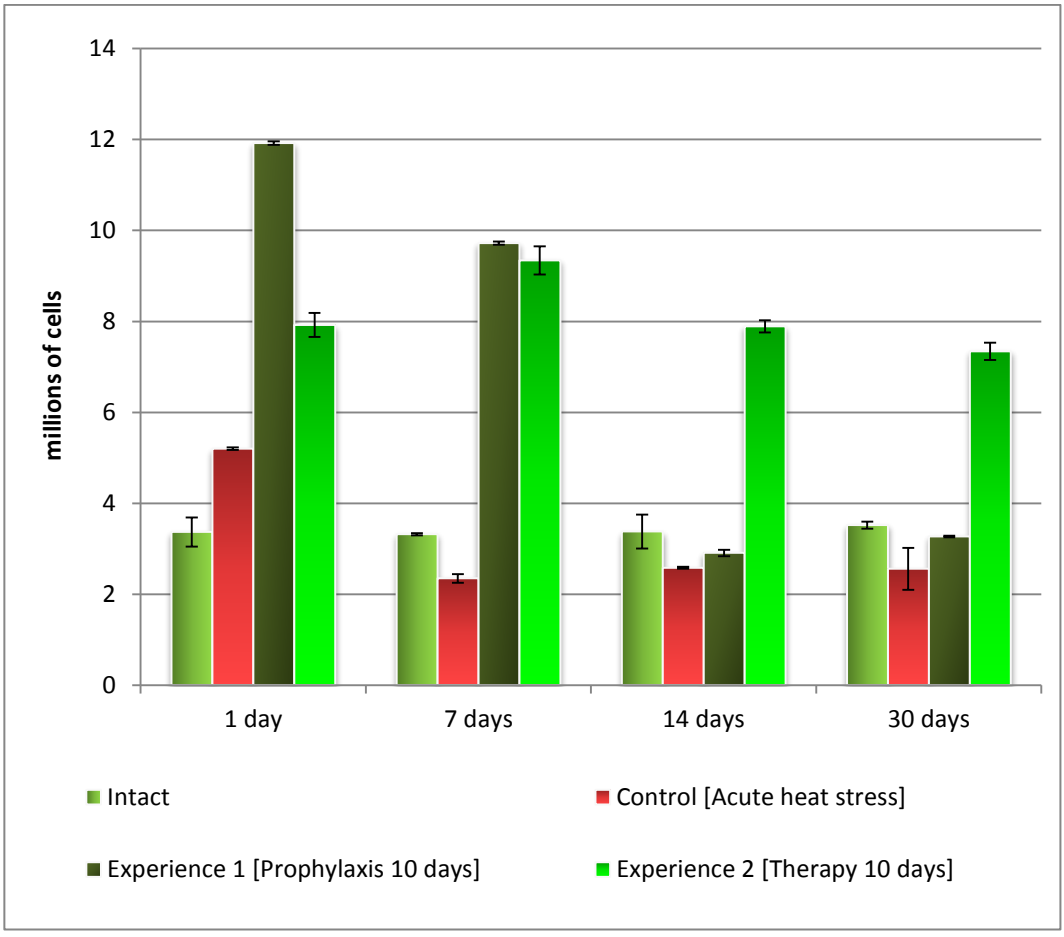

Fig. 1 Dynamics of rats semen in acute thermal exposure, prevention and correction of its consequences by Royal jelly