Dynamics of morphometric indicators of laboratory rats under experimental BLV infection

Authors:
E S Krasnikova, A V Krasnikov, R V Radionov and A Yu Svetozarova
The purpose of our research was to study the dynamics of body weight and the internal organs relative weight under experimental BLV infection in laboratory rats.

The object of the study was Wistar line laboratory rats (n = 60). The rats were divided into 3 equal groups, kept on a full diet including fresh cow's milk. The first group rats (I) were fed milk from intact cows, the second (II) - milk from BLV-infected cows, and the third (III) - milk from cows with leukemia. Rats of groups I, II and III were divided into 2 subgroups: in subgroup "a" there were adult rats, subgroup "b" included their offspring.
Materials and methods

BLV infection in experimental rats was confirmed by the polymerase chain reaction method. Morphometric studies were performed in animals with proviral DNA in the blood at 3, 6, 9 and 12 months from the beginning of the experiment.

Quarterly, five rats of each group were euthanized by cervical dislocation with preliminary aerosol anesthesia with diethyl ether followed by dissection. The material for morphometric studies was the parenchymal organs of rats: kidneys, liver, heart, spleen, and lungs. Weighing of rats and their internal organs was carried out on a JW-1 balance, e = 0.02 g (South Korea).
Figure 1. Dynamics of rats body weight.

Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Figure 2. Dynamics of rats average daily gain.

Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Figure 3. Dynamics of rats relative gain.

Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Results

Figure 4. Experimental rats’ liver relative mass dynamics. Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Results

Figure 5. Experimental rats’ spleen relative mass dynamics.
Results

Figure 6. Experimental rats’ kidneys relative mass dynamics. 
Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Results

Figure 7. Experimental rats’ lungs relative mass dynamics. Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Results

Figure 8. Experimental rats’ heart relative mass dynamics.

Note: Ia - milk from intact cows, Ib - their offspring; IIa - milk from BLV-infected cows IIb - their offspring; IIIa - milk from cows clinically ill with leukemia, IIIb - their offspring.
Conclusion:
Our data indicate that changes in morphometric parameters in BLV-infected rats correlate with changes in internal organs of the pathogen specific hosts, described in the literature. It may be due to the disease pathogenesis peculiarities.
Thus, we can conclude that experimental BLV infection in rats is accompanied by regular trends and changes in animals body weight and their internal organs relative mass, probably due to metabolic disorders and the development of various kinds of pathological processes: inflammatory, dystrophic, atrophic and proliferative. It allows us to recommend using of Wistar rats for modeling BLV infection in laboratory conditions in vivo.