



## Comparative Analysis of the Indicators Recorded in White Rats in the Morris Maze After Mild and Moderate Traumatic Brain Injury

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**Abstract:** The experiment was conducted on 46 three-month-old white breedless rats. After the animals were placed in a wheeled vehicle device, the rats in the experiment with the car moving received a head injury by hitting a tusik made of Chup with the front of the head. The speed of the motor vehicle was 6-7km per hour. All the animals involved in the experiment were transferred from the Morris labyrinth to test their ability to remember after taking a jar.

**Keywords:** Experiment, motor transport, injury, rat, Morris labyrinth.

**Significance.** The development of modern technology and science, in turn, leads to an increase in automation, mechanization and the number of car miles, as well as an increase in injuries and damage. This, in turn, requires a better study of the social and medical aspects of this issue. Special attention is paid to providing more quality and comprehensive medical services to the victims [2,7].

Currently, the increase in the number of deaths and disabilities, the diseases that appear with brain injuries, as well as the several times increase in the number of general injuries, also the problem of neurotraumas bring the above-mentioned direction to the top of the list of priorities. [1,3,9].

The causes of injury in the brain system are a multifaceted process, and these indicators mainly depend on sex, age, profession, alcohol consumption and other similar conditions. The numbers of head injuries vary significantly. [4, 6, 10]. It is worth mentioning another issue, in the general structure of injuries, central nervous system injuries make up 30-40% and take the first place among the causes of permanent and temporary disability of people, and are ahead of cardiovascular and oncological diseases among the causes of death of people of active age. [5, 11]. Under the influence of factors affecting the body from the outside, such as mechanical, chemical or biological factors, the proliferation and transformation of cells, changes in the blood circulation in the organs of the body, changes in the number of lymph nodes in some parts of the organs, or the intertwining of these nodes are manifested [8,13]. The changes noted in these cases provide another opportunity to prevent the aggravating autoimmune stress, which occurs in the body under the influence of biological or chemical agents. The above-mentioned research allows to study and understand the mechanisms taking place in the spleen in more depth, and differentiation operations are considered to be one of the most important indicators of multifaceted and diverse processes in the tissues [12,14].

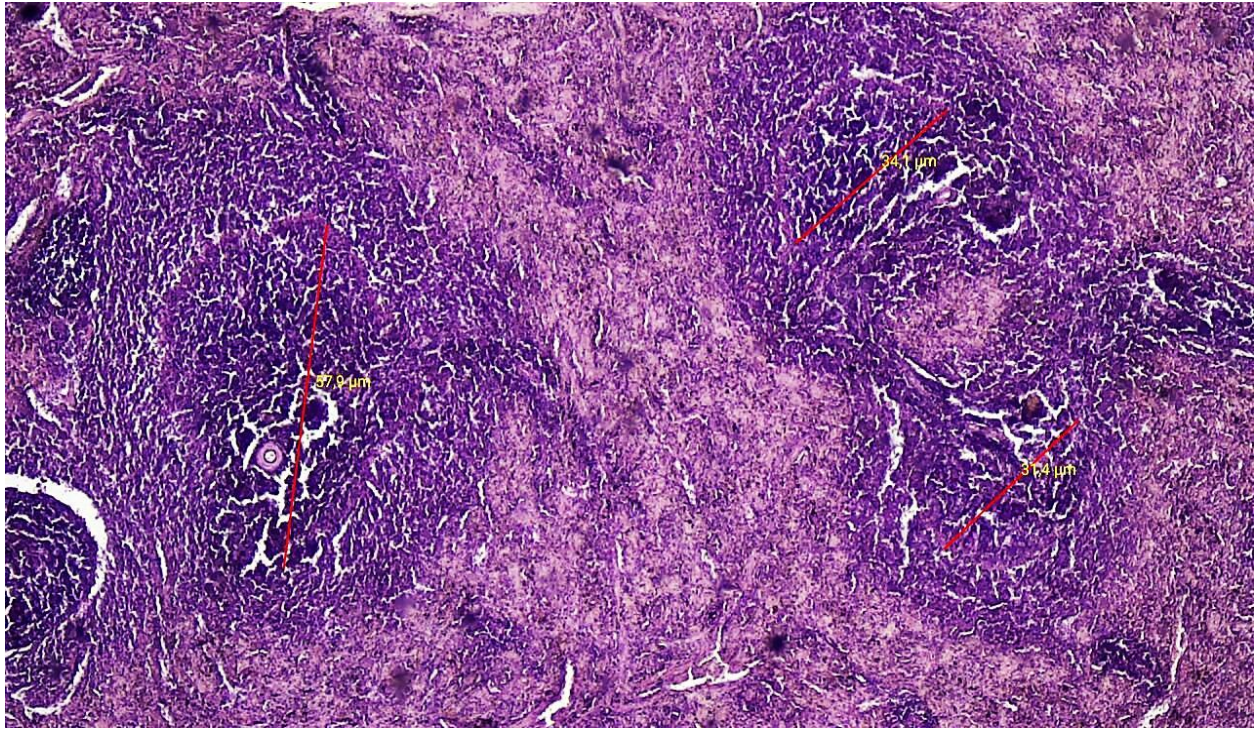
**Materials and methods.** The experiment was performed on 46 3-month-old white rats. The test animals were placed immovably on a wheeled vehicle, and the vehicle moved at a speed of 6-7 km/h and hit a wooden barrier with its forehead. At the end of this experiment, 2 white rats died on the spot, but the rest survived. Before injury, all rats were trained in the Morris water maze for four days to acquire cognitive memory and self-preservation skills in water, and this experience was evaluated

based on time and locomotion performance (Figure 1). After the brain injury, the animals were re-tested to determine the movement criteria based on the same indicators, as a result of which the experimental animals were divided into three subgroups based on the last indicators and taking into account the degree of the injury. The article describes the results of rats with mild and moderate traumatic brain injuries. After receiving the injury, the rats showed a variety of signs depending on the degree. All the animals involved in the test were measured for the time to find the platform in the water and the time they remembered the area, and the analysis was carried out accordingly.



**Picture. 1. Experimental tests in the Morris maze.**

Research results. During the experiment, when the lymphoid apparatus of the spleen was examined seven days after the brain injury, it was found that the lymphatic follicles were mostly medium in size (75-80%), there was a small amount of lymph nodes that were mixed with each other (10-15%), and there were a few irregularly shaped lymph nodes and number (7-10%) was also determined. Although signs of hyperplasia were not found in places, the location of the reactive centers was partially unchanged. In the reactive zone, no inclusions and local zonal changes were hardly detected. Additional tissues and other changes were not observed in the peritrabecular and periarterial zones. Splenic trabeculae have a normal configuration, almost no changes were detected in the tissues, follicles were mostly average in size (60-70%), there was a small number of lymph nodes that had merged with each other (20-22%), and a small number of irregularly shaped lymph nodes (10-15%). (Fig. 2).



**Picture. 2. 3-month-old rat. Intermediate BMJ.**

1. Lymphoid node. 2- Periarterial zone. 3- germinative center.
- 4- mantle zone. 5 – marginal zone.

**Conclusions.** Studies have shown that in cases of traumatic brain injury in animals, that is, some changes in the structure of the spleen, that is, morphometric changes of the lymphoid apparatus, mean an increase of 5-10% compared to the level of severity. Shrinkage of white pulp lymph nodes, germinal centers, PALM, marginal zones and further expansion of the mantle zone were noted. Macroscopic dimensions of the spleen remained unchanged in both cases compared to control rats.

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