

## Abstract

Spinal cord injury (SCI) causes a number of pathophysiological processes, such as a local ischemia and inflammation. In the focus of inflammation, the main function of polymorphonuclear leukocytes is the phagocytosis of dying cells. The active oxygen radicals generated by neutrophils and other phagocytic cells are an important protective mechanism of inflammatory processes that underlie nonspecific immunity. The aim of the work was to study of the phagocytic activity of polymorphonuclear leukocytes of peripheral blood in rats with SCI using local hypothermia as a neuroprotective effect.

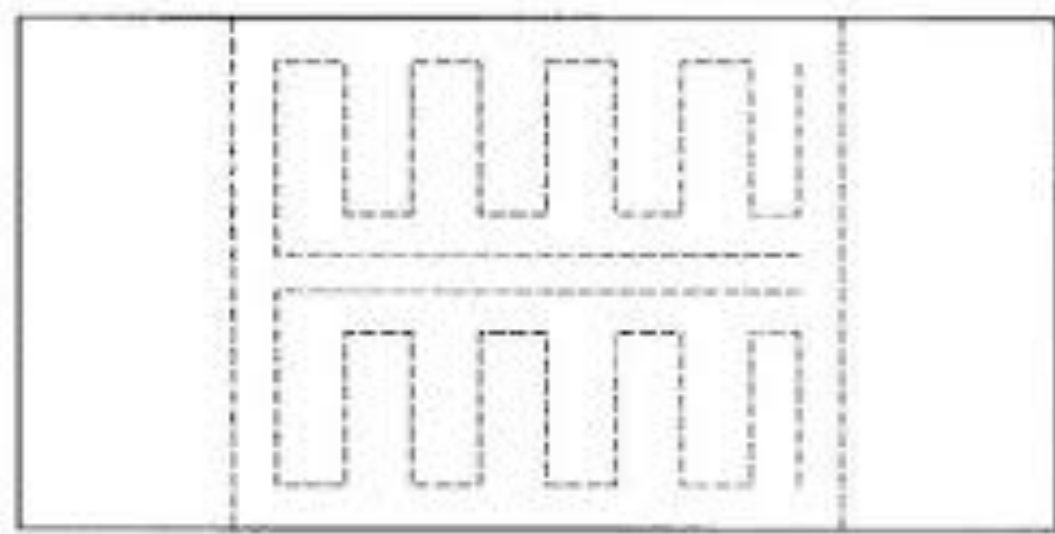


Figure 1. Schilling Meandering method of examining a blood smear for a differential cell count [Laboratory Practicals in Physiology ]

## Results

Activation of the inflammatory reaction in the acute and early stages of SCI was characterized by a decrease in a number of the neutrophilic leukocyte in the second group of animals ( $31.2 \pm 2.746\%$ ,  $p < 0.05$ ) as compared with intact animals ( $40 \pm 1.8\%$ ), at that there was a shift the formula of leukocyte to the left. This process was observed in the situation of the lack of cell production from bone marrow and the situation of the cell death in the presence of heavy inflammation.

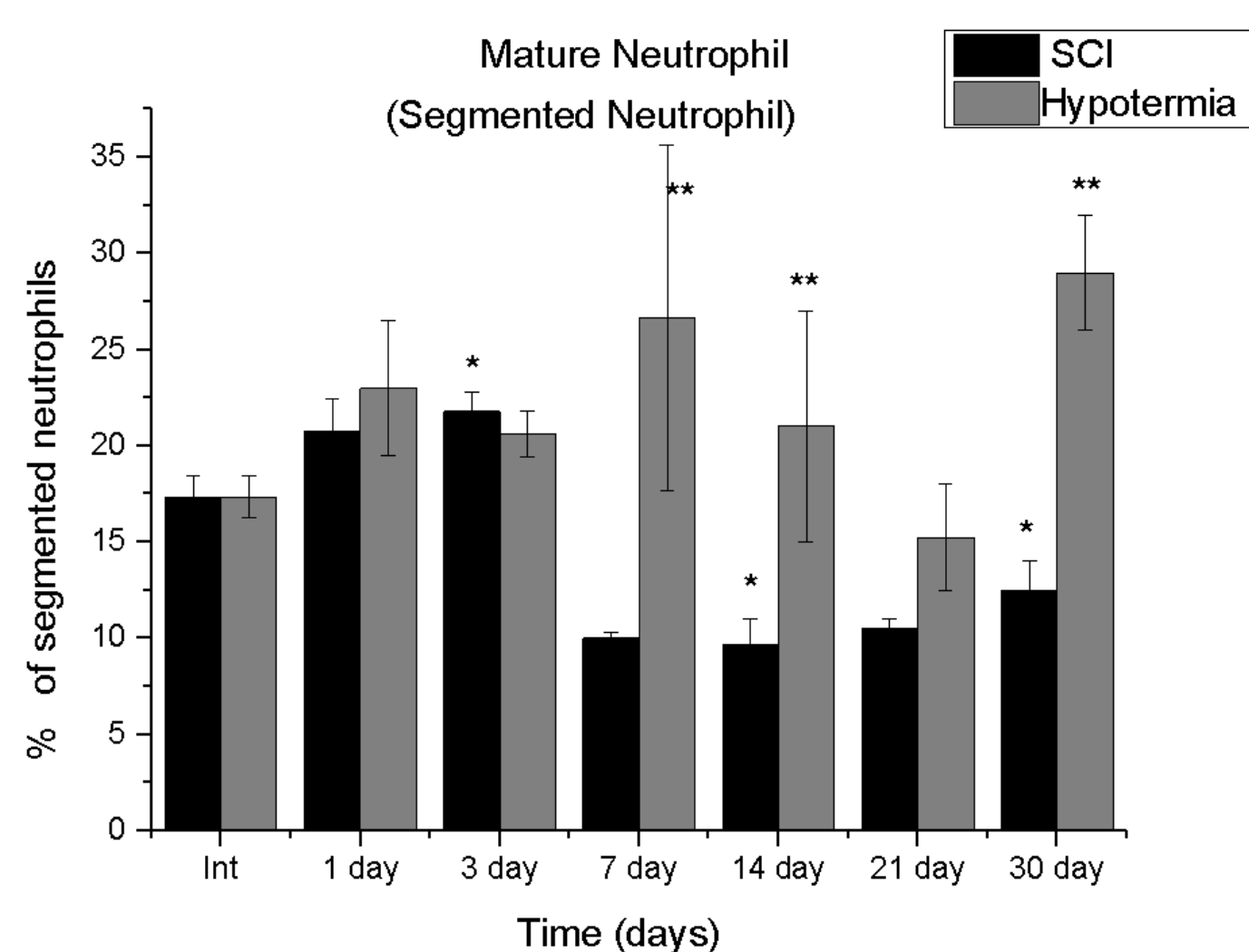


Figure 3. Mature segmented neutrophils

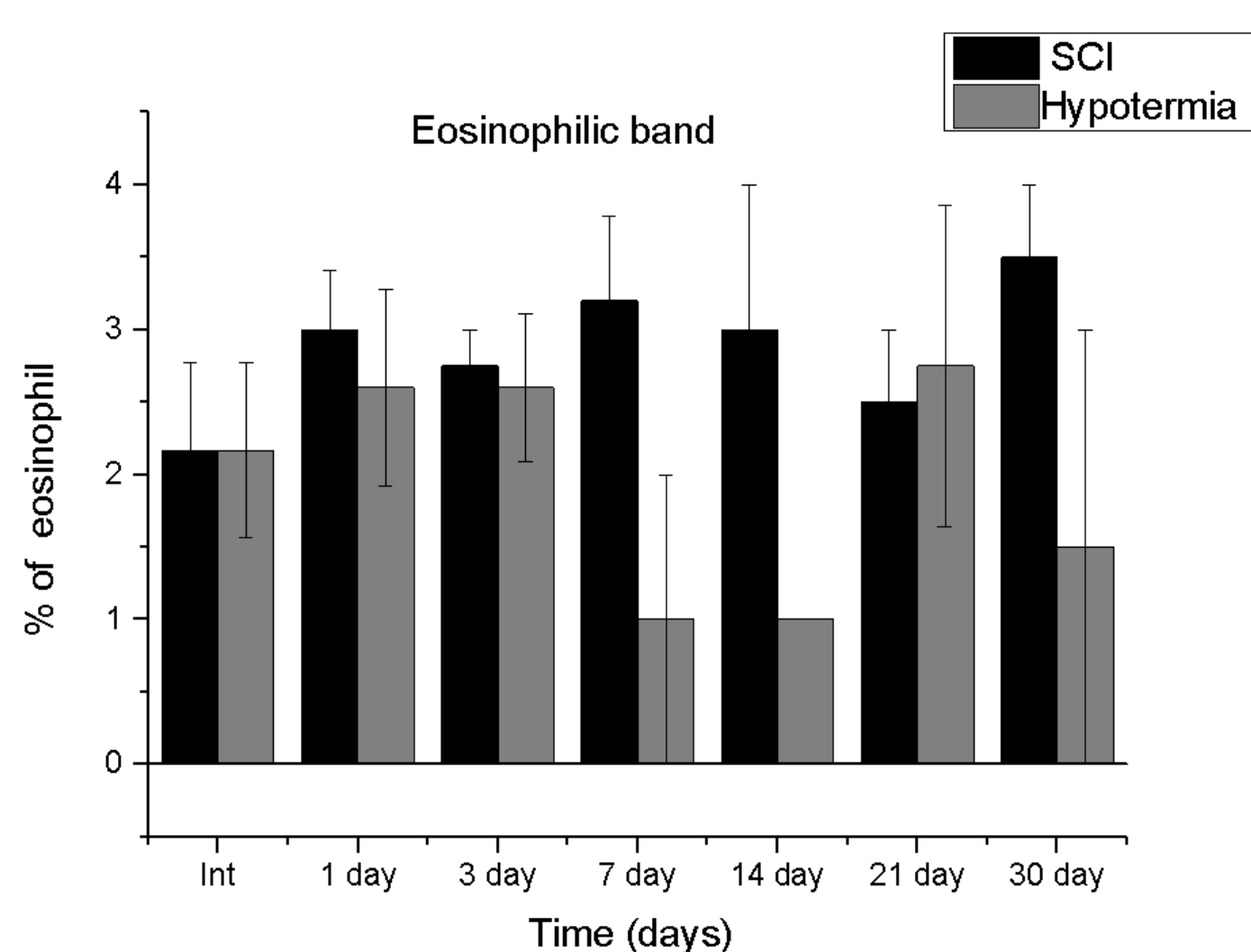


Figure 5. Eosinophilic band

## Materials and Methods

The non-linear laboratory rats were divided into two groups. The SCI was performing at the level of Th8-9 by the A. Allen's method. The first group did not receive the further treatment; the second group received procedure of local hypothermia for 20 minutes after SCI. The blood sampling was collected prior to SCI and on 1, 3, 7, 14, 21 and 30 days after SCI from the caudal vein. The blood smears were stained by method of Romanovsky - Giemsa, the counting of leukocytes was made by the "meander method".

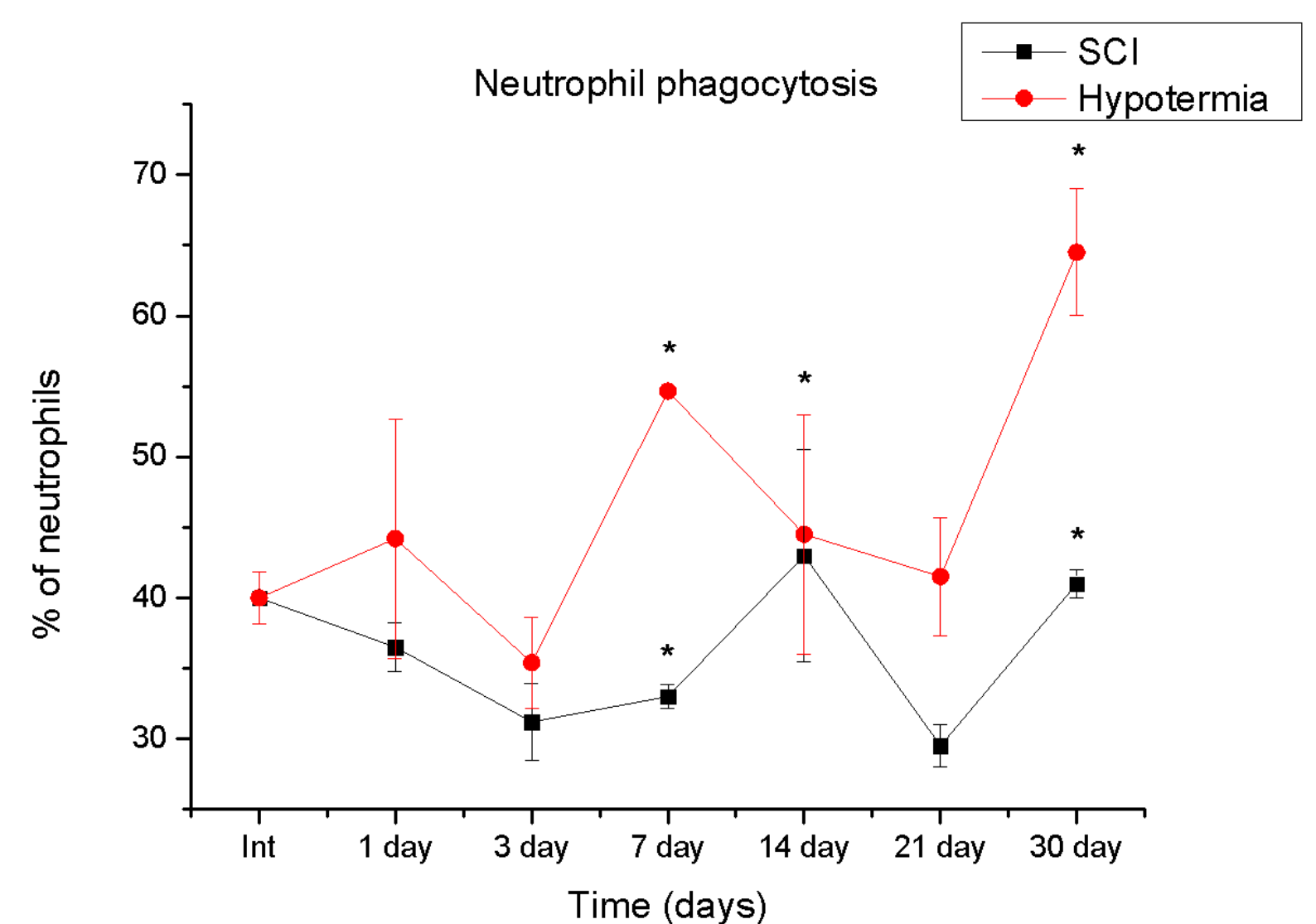


Figure 2. Phagocytic activity of neutrophils

A reliable change in a number of basophils and eosinophils in both groups was not found. A significant increase in the percentage of neutrophils in the second group was observed on the 7th, 14th and 30th days compared with the first group of animals. In the acute phase of SCI it was not found the differences in a number of neutrophils in the group with hypothermia as compared with the intact, which provides a theoretical basis for using of local hypothermia as a neuroprotective therapy for ischemia and inflammation in the early stages of SCI.