THE ACTIVITY OF SELECTED LYSOSONAL HYDROLASES IN THE MOUSE LIVER AFTER PACLITAXEL AND MORPHINE ADMINISTRATION

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Over the last few years, a diterpene alkaloid, taxol, has become significant in chemotherapy. A nitrogen compound of unique structure based on the skeleton of taxan, taxol shows a specific mechanism of antineoplastic activity, stabilizing tubulins in microtubules and inhibiting their secondary depolymerization. These unique properties of taxol have been related to its influence on microtubules. Numerous works suggest that the potential antineoplasts used in chemotherapy, such as taxol, simultaneously act as medicine and cause side effects similar to those caused by toxins. As a result of their action, damaged structures may accumulate in the cell. Because of this, finding the answer to the question of how taxol and morphine influence the lysosomal system is very important.

This paper is aimed at investigating the activity of selected hydrolases in the lysosomal compartment of the mouse liver encumbered with paclitaxel, as well as with both paclitaxel and morphine. The animals were divided into 5 experimental groups; control 0.2 ml PBS (0.9% NaCl); paclitaxel 0.75 mg/kg b.c. for 3 days; for 12 days; paclitaxel 0.75 mg/kg b.c. and morphine 1.25 mg/kg b.c. for 3 days; for 12 days. After treatment, the lysosomal fraction was isolated from the livers, in the obtained lysosomal fractions the protein level and the activity of β-glucosidase (β-GLD, EC. 3.2.1.21), beta-galactosidase (β-GAL EC.3.2.1.23), and beta-glucuronidase (β-Gr EC.3.2.1.31) were determined by published methods.

The data obtained here show that multiple administration of small doses of paclitaxel results in a differentiated increase in the activity of β-GLD, β-Gr and β-GAL. The combined effect of paclitaxel and morphine caused a statistically significant increase in the activities of these enzymes. The picture obtained here is closely correlated with the tendency to change the hepatocyte ultrastructure (an increase in the activity of the lysosomal system and an intense development of the Golgi apparatus) and can be considered an adaptative response of the cell to the combined action of paclitaxel and morphine.