Acta Paediatrica Hungarica 29 (1–2), pp. 43 (1988–89)

Specific effect of leucine-O-methyl ester on macrophages

Ildikó Csuka*, B Szende, F Antoni*, K Lapis

1st Institute of Biochemistry* and 1st Institute of Pathology and Experimental Cancer Research Semmelweis University Medical School, Budapest

L-Leucine-O-methylester (Leu-OMe) and less extent other amino acid methyl esters have been shown to be lysosomotropic. Leu-OMe proved to be selectively toxic for peripheral blood monocytes [2].

In this study we are demonstrating the effect of in vitro Leu-OMe treatment on the caseine elicited murine peritoneal macrophage (MØ) acid phosphatase and endogenous peroxydase enzyme activities.

Peritoneal exudate cells elicited by caseine were treated in vitro with 5 mmole of Leu-OMe in suspension culture for 10–60 mins. The ultrathin sections were examined under electron microscope. Acid phosphatase and endogenous peroxidase reactions were assayed.

Ultrastructurally acid phosphatase showed positivity in the periphery of lysosomes 10 mins after Leu-OMe treatment of peritoneal exudate cells. Vacuolised phagolysosomes replace nearly the whole cytoplasm of MØ treated in vitro with Leu-OMe for 40 mins. At the same time the acid phosphatase and peroxidase enzyme activities were not dectable. Nearly total destruction of the cytoplasm was observed, but the nuclear membrane and plasma membrane being to remain. After 60 mins of Leu-OMe treatment all MØ were practically destructed.

The nuclei of MØ were apparently undamaged for a relatively long period (40 mins) of Leu-OMe treatment, even under electron microscope [1]. In some instances the cell membrane was still present and the MØ showed a characteristic "ghost image".

References

1. Csuka I, Szende B, Antoni F, Lapis K: Effect of O-methyl esters of amino acids on macrophages Proc. Sec. Int. Conf. on the Role of formaldehyde in biological systems. SOTE press 27, 1987
2. Thiele DL, Lipsky PE: Modulation of human natural killer cell function by leucine methyl ester: monocyte-dependent depletation from human peripheral blood mononuclear cells. J Immunology 134: 786, 1985