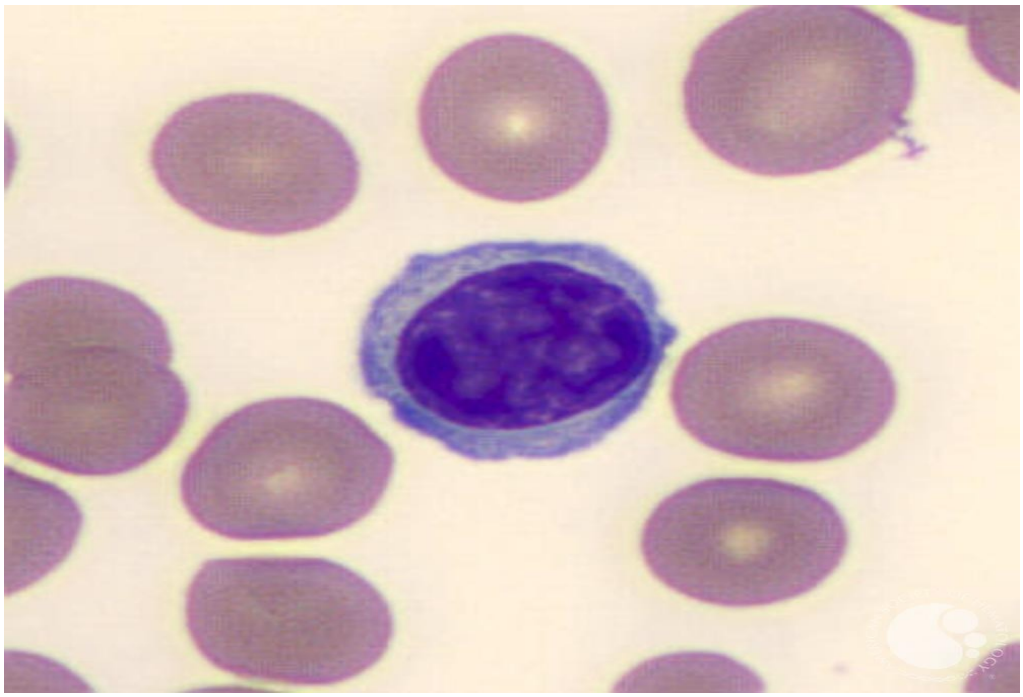
Medical PEMF Studies

L Y M P H O C Y T E S

Changes in cell death of peripheral blood lymphocytes isolated from children with acute lymphoblastic leukemia upon stimulation with 7 Hz, 30 mT pulsed electromagnetic field.



1. Cell Mol Biol Lett. 2015 Mar;20(1):130-42. doi: 10.1515/cmble-2015-0006.

Kaszuba-Zwoińska J, Ćwiklińska M, Balwierz W, Chorobik P, Nowak B, Wójcik-Piotrowicz K, Ziomber A, Malina-Novak K, Zaraska W, Thor PJ.

Pulsed electromagnetic field (PEMF) influenced the viability of proliferating in vitro peripheral blood mononuclear cells (PBMCs) isolated from Crohn's disease patients as well as acute myeloblastic leukemia (AML) patients by induction of cell death, but did not cause any vital changes in cells from healthy donors. Experiments with lymphoid U937 and monocytic MonoMac6 cell lines have shown a protective effect of PEMF on the death process in cells treated with death inducers. The aim of the current study was to investigate the influence of PEMF on native proliferating leukocytes originating from newly diagnosed acute

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lymphoblastic leukemia (ALL) patients. The effects of exposure to PEMF were studied in PBMCs from 20 children with ALL. PBMCs were stimulated with three doses of PEMF (7 Hz, 30 mT) for 4 h each with 24 h intervals. After the last stimulation, the cells were double stained with annexin V and propidium iodide dye to estimate viability by flow cytometric analysis. The results indicated an increase of annexin V positive as well as double stained annexin V and propidium iodide positive cells after exposure to threefold PEMF stimulation. A low-frequency pulsed electromagnetic field induces cell death in native proliferating cells isolated from ALL patients. The increased vulnerability of proliferating PBMCs to PEMF-induced interactions may be potentially applied in the therapy of ALL. The analysis of expression of apoptosis-related genes revealed changes in mRNA of some genes engaged in the intrinsic apoptotic pathway belonging to the Bcl-2 family and the pathway with apoptosis-inducing factor (AIF) abundance upon PEMF stimulation of PBMCs.

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