

Pulsed electromagnetic fields decrease proinflammatory cytokine secretion (IL-1 b and TNF- a) on human fibroblast-like cell culture

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Received: 24 January 2010 / Accepted: 27 March 2010 / Published online: 7 April 2010
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Abstract The clinical use of pulsed electromagnetic fields (PEMF) in osteoarticular pathology is widely extended, although the mechanisms involved are unknown. The aim of this study was to evaluate the action of a new protocol of treatment with PEMF on liquid medium cultures of fibroblast-like cells derivatives of mononuclear peripheral blood cells. Fibroblast-like cells growth was obtained in liquid medium culture from mononuclear cells (MNC) of human peripheral blood. The PEMF irradiation protocol included an intensity of 2.25 mT, a frequency of 50 Hz and an application time of 15 min on days 7, 8 and 9 of cell culture. Immunophenotype was performed with specific heterologous monoclonal antibodies for each cell receptor (Vimentin, Cytokeratin, CD34, CD41, CD61 and CD68). The cytokines' production was determined in the supernatant of the culture medium by means of the Lumindex technology. The immunophenotype did not show any statistical difference on comparing treated against non-treated cell cultures on any of the days. In the treatment cell

population, the proinflammatory cytokines, IL-1b and TNF- a showed a significant decrease on days 14 and 21 of the culture, whilst IL-10 increased significantly on day 21. It is concluded that PEMF irradiation does not alter the cell immunophenotype of the fibroblast-like cell population, but does provoke a decrease in the production of inflammatory-type cytokines (IL-1b, TNF- a) and an increase in cytokines of lymphocytic origin (IL-10). These facts coincide with the chronology of the clinical effect undergone by patients with osteoarticular pathology after PEMF irradiation.

Keywords PEMF · Mesenchymal stem cells · Fibroblast-like cells · IL-1 b · TNF- a

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