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Liberation of the interleukin-1 beta in macrophages stimulated using galvanic current

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Abstract

Introduction and Aims Percutaneous needle electrolysis (PNE) is a therapeutic tool which has demonstrated its effectiveness for the treatment of tendinopathies and muscle problems. However, there is a scarcity of basic and fundamental information directed at getting to know the effects of the same on the molecular level. The aim of the present study was to confirm whether, after the use of galvanic current on macrophages in culture, there is a liberation of pro-inflammatory cytokines.

Material and Methods Using a special device designed for cellular cultures (Physio Invasiva® device, PRIM), two impacts were applied with a current intensity of 3 mA during two seconds to differentiated cell macrophage cell cultures of C57/BL6 mice of the bone marrow and previously stimulated with bacterial lipopolysaccharides (1 µg/ml, 4h). Once the currents were applied, the macrophages were incubated 16h and subsequently, the amount of interleukin-1 beta (IL-1b) was determined in the supernatant of lactate dehydrogenase.

Results The application of the galvanic current resulted in the liberation of IL-1b, without an increase in cell death. The Western blot study demonstrated that the IL-1b that is liberated corresponds with the mature form of 17 kDa of this cytokine, therefore we speculate that the galvanic current may induce the activation of the inflammatory caspase, caspase-1, via the formation of inflammasomes.

Conclusions The data obtained suggest that the liberation of IL-1b may regulate the inflammatory and therapeutic effects of the galvanic current.

Keywords
- percutaneous needle electrolysis
- galvanic current
- inflammation
- cytokines

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