

Effects on a static magnetic field on lipopolysaccharide-induced cytotoxicity of fibroblasts-an vitro investigation

李勝揚

Huang H-M;Lin C-T;Chen Y-F;Tsai C-M;Lo Y-J;Lan W-H;Lee S-Y

Abstract

Lipopolysaccharide (LPS) is one of the principal substances that initiate a hyper immune host response in microbial infection which results in soft tissue inflammation and bone destruction. It is also the main substance that causes microbial septicemia or septicemia-induced shock. Recent studies have indicated that the mechanisms of periodontal infection are similar to those of septicemia. With regard to the treatment of the hyper-immune response, numerous researches on the development of drugs that can inhibit the interaction between LPS and its receptors has regularly been conducted. In the experimental method, fibroblast cells were challenged with LPS to initiate an inflammatory reaction. Comparisons of the cell number and IL-6 level were made between the static magnetic field (SMF)-exposed group and an unexposed group. Our results showed that mortality rates of fibroblasts exposed to 1000, 2500, and 4000 G SMFs were 45.6%, 37.8% and 15.8%, respectively. The results demonstrated lower mortality rates when compared to the control group (57.4%, $p < 0.05$). Meanwhile, a linear correlation was observed between the mortality rate of LPS-induced cells and the magnetic intensity ($y = -9.829x + 57.582$, $R^2 = 0.963$, $p < 0.05$). In addition, similar tendencies were also found for IL-6 levels. These results indicate that a static magnetic field may decrease LPS-induced cytotoxicity which deserves further investigation.