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Evaluation of apoptosis induction in human peripheral blood mononuclear cells and synovial cells in patients with rheumatoid arthritis

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Rheumatoid arthritis (RA) is a chronic inflammatory destructive disease involving the joint and characterized by T-lymphocyte accumulation within the synovial compartment. It is dominated by the presence of macrophages, plasma cells and synovial fibroblasts which are the main pathogenic factors leading to the destruction of bone and cartilage. The survival of these cells may be promoted by inadequate apoptosis leading to synovial hyperplasia. So, the aim of the present study was to evaluate the apoptosis levels before and after induction of apoptosis using anti-Fas mAb, both in peripheral blood (PB) and synovial fluid (SF) infiltrating mononuclear cells (MCs) of patients with RA. CD4+ T cell subsets and cell survival assays were also done to investigate correlations between these parameters. The study was conducted on 15 patients with RA, 10 individual volunteers as a control group and 10 patients with osteoarthritis (OA) as a control group for SF evaluations (have defective Fas expression on their cells). Results of this work revealed that in vitro induction of apoptosis by anti-Fas mAb resulted in increase of: percent (%) reduction of cell viability in PBMCs and SFMCs, % reduction of CD4+ T cell subsets and apoptotic cell % in all studied groups than before induction. The increase in the three parameters is only significant in SF of RA group compared to PB while it is non significant in OA group due to the defective Fas expression on OA cells. Our results also showed a significant positive correlation between CD4+ T cell and viability percentages before induction of apoptosis in SF of RA and between apoptosis levels and CD4+ T cell percentage after induction of apoptosis in the SF of RA group. In conclusion, activated T cells infiltrating SF of RA patients have functional Fas antigen which enable them to undergo in vitro apoptosis using anti-Fas mAb. The cytotoxicity of which is more specific to local lesion such as SF of RA patients suggesting that local administration of this anti-Fas mAb may represent a promising new therapy for RA patients.