The Influence of Resveratrol on the Synovial Expression of Matrix Metalloproteinases and Receptor Activator of NF-κB Ligand in Rheumatoid Arthritis Fibroblast-Like Synoviocytes

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Medication of rheumatoid arthritis (RA) remains challenging and often controversial concerning side effects or long-term complications. We investigated the effect of resveratrol, a phytoalexin discussed for its chondro-protective and anti-inflammatory qualities, on the synovial expression of matrix-degrading enzymes like matrix metalloproteinases (MMPs) and bone-remodelling proteins in RA fibroblast-like synoviocytes (FLS). Interleukin-1β-stimulated RA-FLS were treated with 100 \(\mu\text{m}\) resveratrol for 24 h. To evaluate the effect of resveratrol on the amount of bound/combined MMPs, a Luminex\textsuperscript{®} xMAP multiplexing technology was used. The alteration in expression of receptor activator of nuclear factor-κB ligand (RANKL) and osteoprotegrin (OPG) was measured by quantitative real-time polymerase chain reaction (qRT-PCR). Resveratrol reduced the expression of MMP-1 \((p = 0.022)\), MMP-3 \((p = 0.021)\), and MMP-9 \((p = 0.047)\). qRT-PCR showed a significant reduction in the relative abundance of the transcripts of OPG \((p = 0.012)\) and RANKL \((p = 0.018)\).

Our \textit{in vitro} findings indicate that resveratrol could be a new target for further pharmacological studies in the field of RA. In the future it could play a role as a possible substitute or supplement to currently used drugs against RA to prevent cartilage matrix degradation and pathological bone resorption due to inhibition of MMPs and RANKL.

\textit{Key words:} Resveratrol, Rheumatoid Arthritis, Matrix Metalloproteinases