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Cytorich: A novel anti-inflammatory/catabolic and regenerative autologous blood-derived product for osteoarthritis treatment

Statement of the Problem: Osteoarthritis (OA) is degenerative joint disease characterized by cartilage damage and synovial inflammation. Autologous blood-derived products target special inflammatory molecular pathways and have a beneficial therapeutic effect for inflammatory pathologies. The purpose of this study was to assess the *in vitro* and *in vivo* anti-inflammatory/ catabolic and regenerative potential of a novel autologous blood product (Cytorich).

Materials and Methods: Blood samples from healthy donors were incubated using different techniques for 24h and analyzed for the presence of anti-inflammatory (IL-1ra), anti-catabolic (tissue inhibitors of metalloproteinases, TIMPs), regenerative, pro-inflammatory (TNF- α , IL-1) and catabolic (matrix metalloproteinases, MMPs) molecules. Double-blinded controlled clinical study was conducted to evaluate clinical effectiveness and safety of the final product using VAS (Visual Analog Scale) and WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) scales.

Results: The highest concentration of therapeutic molecules targeting inflammatory and degeneration pathways in OA, as well as platelet-derived growth factor, was found in 24h 37°C incubated blood. However, the increased production of catabolic MMP9 and TNF- α and IL-1 was detected in the product. We have found that this negative effect could be blocked by adding citric acid making future OA treatment safer and more effective. Double-blinded controlled clinical study has shown a safety and efficiency of this new product. The analysis of WOMAC and VAS scores revealed improvement in pain and daily activities parameters.

Conclusion and Significance: Cytorich is an efficient and safe autologous product for OA treatment since it has been reported as a source of human bioactive molecules playing a key role in the fundamental processes stimulating tissue repair and regeneration.

Biography

Anthony Galea practices sport medicine in Toronto and is considered one of the pioneers in the uses and applications of platelet rich plasma in musculoskeletal disorders. He has functioned as a sport physician for many professional and Olympic competitions and his clients includes some of the world's best athletes. He is also an author and researcher; his current research focuses on autologous cytokines for the treatment of osteoarthritis. He is married with seven children.

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