Rejuvenation Research Volume 23, Number 5, 2020
DOI:10.1089/rej.2019.2263

Intra-Articular Injections of a Whole Blood Clot Secretome, Autologous Conditioned Serum, Have Superior Clinical and Biochemical Efficacy Over Platelet-Rich Plasma and Induce Rejuvenation-Associated Changes of Joint Metabolism: A Prospective, Controlled Open-Label Clinical Study in Chronic Knee Osteoarthritis

Larisa Shirokova,[1] Sergey Noskov,[1] Victoria Gorokhova,[1] Julio Reinecke,[2] and Ksenia Shirokova[1]

Abstract

Osteoarthritis is a frequent, age-associated disease affecting >10% of world's population over 60 years of age.This study intended to compare intra-articular whole blood clot secretome (autologous conditioned serum [ACS], recently re-named blood clot secretome [BCS]) to platelet-rich plasma (PRP) in knee osteoarthritis (OA). A clinical, nonrandomized open-label comparison of ACS versus PRP in knee OA with subclinical or moderate synovitis symptomology was performed. One hundred and twenty-three patients with knee OA, Kellgren and Lawrence grade II–III, were each treated with six i.a. injections of ACS or PRP. The clinical efficacy was measured by visual analog scale and Western Ontario and McMaster Universities Arthritis Index (WOMAC) score. The biochemical effects measured include synovial fluid (SF) viscosity, cytokines interleukin (IL)-1Ra and IL-1b, radical footprint NO_3, and conjugated dienes (CDs). At the 3-month follow-up, clinical efficacy of ACS was significant in all groups, versus PRP. PRP had significant versus baseline efficacy in subclinical, but not in moderate, synovitis cases. ACS was more effective than PRP regarding all analytical parameters. It induced endogenous IL-1Ra expression, downregulated IL-1b, and improved SF viscosity. ACS reduced—significantly stronger than PRP—the concentration of CDs—interpreted as reactive oxygen species footprints—and NO_3—interpreted as nitric oxide footprint—in SF. ACS displayed significant efficacy in all groups, which was clinically and biochemically superior to PRP. ACS appears to improve i.a. homeostasis. Strength of this open clinical study is the combination of clinical and biochemical data.

Keywords: osteoarthritis, clinical study, blood clot secretome, BCS, platelet-rich plasma, PRP, autologous conditioned serum, ACS