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Platelet-rich plasma (PRP) for osteoarthritis (OA) of the knee

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Abstract:

Osteoarthritis, also called degenerative joint disease, is the most common type of joint disease and is one of the 10 most disabling conditions in developed nations. It is characterized by the progressive erosion of articular cartilage and inflammatory cells.

The promising therapeutic potential and regenerative properties of platelet-rich plasma (PRP) have rapidly led to its widespread clinical use in musculoskeletal injury and disease. Although the basic scientific rationale surrounding PRP products is compelling, the clinical application has outpaced the research. Objective. The purpose of this report is to examine the current concepts around the clinical application of PRP in OR in the knee.

Introduction:

Osteoarthritis (OA) is the most common chronic joint disorder, and it causes detrimental effects on the quality of life and functional status. These are characterized by progressively occurring cartilage destruction, osteophyte formation, and subchondral sclerosis1, 2). The histopathological findings of OA show that homeostasis between the destruction and repair mechanisms of the joint cartilage is disturbed by the increased expression of inflammatory reaction . This causes degradation of the joints along with the insufficiency in the synthesis of growth factors and anti-inflammatory cytokines leading to pain, stiffness and swelling.

Platelet-rich plasma (PRP) is an autologous concentration of a high number of platelets in a small volume of plasma, and it is prepared by centrifugation of blood. Platelets contain significant amounts of cytokines and growth factors which are capable of stimulating cellular growth, vascularization, proliferation, tissue regeneration, and collagen synthesis. Delivery of high concentrations of cytokines and GFs to damaged tissues by PRP is considered to have a beneficial effect on tendon and cartilage tissue regeneration

intra-articular PRP injections for the treatment early mild to moderate osteoarthritis (OA) have been reported to reduce pain, while also improving range of motion and quality of life.

Discussion:

1. Source number (1)

90 patients were available for the 2-year follow-up (24 patients presented a bilateral lesion, in a total of 114 knees treated). All of the patients presented a chronic knee degenerative condition and were treated with 3 intra-articular PRP injections.

All of the evaluated parameters worsened at the 24-month follow-up: these parameters were at significantly lower levels with respect to the 12-month evaluation (the IKDC objective evaluation fell from 67 to 59% of normal and nearly normal knees; the IKDC subjective score fell from 60 to 51), even if they remained higher than the basal level. Further analysis showed better results in younger patients ($P = 0.0001$) and lower degrees of cartilage degeneration ($P < 0.0005$). The median duration of the clinical improvement was 9 months. [2]

2. Source number (2)

A total of 78 patients (156 knees) with bilateral OA were divided randomly into 3 groups .Group A (52 knees) received a single injection of PRP،group B (50 knees) received 2 injections of PRP 3 weeks apart, and group C (46 knees) received a single injection of normal saline .White blood

cell (WBC)– filtered PRP with a platelet count 3 times that of baseline (PRP type 4B) was administered in all .

All the groups were homogeneous and comparable in baseline characteristics. Clinical outcome was evaluated questionnaire before treatment and at 6 weeks, 3 months, and 6 months after treatment. improvement was noted in groups A and B within 2 to 3 weeks and lasting until the final follow-up at 6 months, with slight worsening at the 6-month follow-up.The 3 groups were compared with each other, and no improvement was noted in group C as compared with groups A and B ($P < .001$). There was no difference between groups A and B, and there was no influence of age, sex, weight, or body mass index on the outcome. Knees with Ahlback grade 1 fared better than those with grade 2. Mild complications such as nausea and dizziness, which were of short duration, were observed in 6 patients (22.2%) in group A and 11 patients (44%) in group B.[3]

Source number (3)

50patients with knee OA were followed for a minimum of 12 months .All were treated with 2 intra-articular injections of autologous PRP.25 patients had undergone a previous operative intervention for cartilage lesions, whereas 25 had not Operated patients had undergone either cartilage shaving or microfracture. The differences in improvement between operated and nonoperated patients were also investigated, as were those between sexes.

All patients showed significant improvement in all scores at 6 and 12 months and returned to previous activities. No significant difference in improvement was found between the evaluated subgroups .[4]

Conclusion:

Finally, several clinical studies have reported improvements in patient-reported outcomes and a significant reduction in pain scores following PRP treatment in damaged tissue with different condition in knee**.**

References:

1) Vinay Kumar, Abul Abbas ,Nelson Fausto. Robbins and Conran's Pathologic Basis of Disease 7th ed. Philadelphia, PA: ElsevierSaunder. Available at: https://link.springer.com/article/10.1007/s00167-010-1238-6
2) Sandeep Patel, MS, Mandeep S. Dhillon, MS, FAMS†, Sameer Aggarwal. Treatment With Platelet-Rich Plasma Is More Effective Than Placebo for Knee Osteoarthritis. January 8, 2013. Available at: http://journals.sagepub.com/doi/abs/10.1177/0363546512471299
3) Alberto Gobbi, Georgios Karnatzikos, Vivek Mahajan, Somanna Malchira, .Platelet-Rich Plasma Treatment in Symptomatic Patients With Knee Osteoarthritis. January 20, 2012 Available at http://journals.sagepub.com/doi/abs/10.1177/1941738111431801