Single Dose of Intra-Muscular Platlet Rich Plasma Reverses the Increase in Plasma Iron Levels in Exercise Induced Muscle Damage: A Pilot Study

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Objectives: Autologous Platelet Rich Plasma (PRP) therapy, is considered to be a promising solution in accelerating the healing process of injured skeletal muscle tissue. In addition to the release of growth factors, PRP also promotes concentrated anti-inflammatory signals, including interleukins. However, the impact of the intramuscular administration of the PRP on hematologic and biochemical responses has not been fully elucidated in exercise induced muscle damage.
Methods: Twelve healthy moderately active male volunteers, without previous experience with eccentric/concentric elbow flexors exercise, participated in this study. They were divided into two groups: control group (CONTROL, n=6) and platelet rich plasma administration group (PRP, n=6) group. To induce muscle damage, subjects in both groups performed concentric/eccentric contractions with load of (80 % 1RM) maximal voluntary contraction of the elbow flexors until point of exhaustion of the non-dominant arm. The non-dominant arms of the PRP group were treated with autologous PRP (Regen ACR-C, Regen Lab, Switzerland) post-24h exercise induced damage (DOMS). Subsequently, 4 ml PRP samples was injected using a 20-gauge needle into the region of the biceps brachii of the non-dominant arm under sterile aseptic conditions. Venous blood samples were collected pre-, and 4 days post-exercise, and analyzed for complete blood counts, serum ferritin, iron, iron binding capacity (IBC), creatinine kinase (CK), lactate dehydrogenase (LDH), aspartate aminotransferase (AST), alanine aminotransferase (ALT) as markers of muscle damage and inflammation.
Results: We found that the baseline levels of iron, ferritin, IBC, CK, LDH, AST and ALT were similar in control and PRP groups. However, 24 h following exercise induced muscle damage a significant increase in these parameters was observed in both groups. Interestingly, PRP administration decreased plasma iron levels compared to the control group but this was only achieved on the second day of post-exercise induced muscle damage. In addition, the plasma IBC levels increased in PRP group from day 2 to 4 post exercise compared to control group. PRP administration had no effect on plasma ferritin, CK, LDH, AST, and LDH levels.
Conclusion: Acute exhaustive exercise increased muscle damage markers, including plasma iron, IBC and ferritin levels, indicating metabolic stress due to exercise induced muscle damage. PRP administration decreased the iron levels post-exercise and may have a role to play in the recovery of exercise induced muscle damage

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