The Role of Leukocytes from L-PRP/L-PRF in Wound Healing and Immune Defense: New Perspectives

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Abstract

Platelet concentrates for topical use are innovative tools of regenerative medicine and their effects in various therapeutical situations are hotly debated. Unfortunately, this field of research mainly focused on the platelet growth factors, and the fibrin architecture and the leukocyte content of these products are too often neglected. In the four families of platelet concentrates, 2 families contain significant concentrations of leukocytes: L-PRP (Leukocyte- and Platelet-Rich Plasma) and L-PRF (Leukocyte- and Platelet-Rich Fibrin). The presence of leukocytes has a great impact on the biology of these products, not only because of their immune and antibacterial properties, but also because they are turntables of the wound healing process and the local factor regulation. In this article, the various kinds of leukocytes present in a platelet concentrate are described (particularly the various populations of granulocytes and lymphocytes), and we insist on the large diversity of factors and pathways that these cells can use to defend the wound site against infections and to regulate the healing process. Finally, the impact of these cells in the healing properties of the L-PRP and L-PRF is also discussed: if antimicrobial properties were already pointed out, effects in the regulation of cell proliferation and differentiation were also hypothesized. Leukocytes are key actors of many platelet concentrates, and a better understanding of their effects is an important issue for the development of these technologies.

Keywords: Blood platelet, fibrin, growth factors, leukocytes, platelet-rich fibrin (PRF), platelet-rich plasma (PRP), regenerative medicine, wound healing.