EDITORIAL

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Necessity of standardized protocol for platelet-rich plasma therapy in temporomandibular joint osteoarthritis

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Temporomandibular joint (TMJ) osteoarthritis (OA) is defined as chronic joint pain caused by the progressive degeneration of the articular cartilage through an imbalance between anabolic and catabolic conditions in the TMJ[1]. Although the pathophysiological etiologies of TMJ-OA are largely unknown, the excessive mechanical stress, aging processes involved with hormonal alterations, and individual heredity have been verified as risk factors for TMJ-OA. On the other hand, the increased risk factors induce a homeostatic imbalance between the anabolic (synthesis) and catabolic (degeneration) conditions in the articular cartilage of the TMJ. Subsequently, a homeostatic imbalance induces an upregulation of the pro-inflammatory cytokines, such as interleukin (IL)-1β, tumor necrosis factor-α, and IL-6 and catabolic growth factors in the synovial fluids of the TMJ[2]. Finally, upregulated pro-inflammatory cytokines and catabolic growth factors not only induce an increase in the cartilage degrading enzymes, such as matrix metalloproteinase (MMP)-13, MMP-3, MMP-1, a disintegrin, and metalloproteinase with thrombospondin motifs (ADAMTS)-4, and ADAMTS-5 to progressively breakdown of extracellular matrix[3], but also induce the abnormal remodeling of the subchondral bone and the apoptosis of chondrocytes in the articular cartilage of TMJ. In addition, the biological linkage between the progressive degeneration of the articular cartilage of the TMJ and the occurrence of orofacial pain is still largely unknown. For these reasons, clinical treatments for patients with TMJ-OA focused only on the relief from orofacial pain caused by progressive degeneration of the articular cartilage. Therefore, as a strategy for maintaining the homeostasis of the synovial joints, recent studies on preventive medicine for OA attempted to shift the metabolic status of the joints from the catabolic to the anabolic state using anabolic materials.

Platelet-rich plasma (PRP) is blood plasma that has been enriched with platelets and contains several different growth factors and cytokines that can stimulate the healing of various tissues. Therefore, autologous PRP has been considered a clinical anabolic material for patients with chronic joint pain caused by progressive cartilage degeneration of the synovial joints. A systematic review and meta-analysis related to the clinical efficacy of intra-articular PRP injection into the synovial joints with OA have shown significant clinical improvements[4]. More recently, Kütük et al.[5] and Hegab et al.[6] reported that an intra-articular PRP injection is an effective treatment for TMJ-OA through the regeneration of fibrocartilage and cartilage, bone repair in the TMJ. On the other hand, Bottegoni et al.[7] recently reported that the intra-articular PRP injection into the knee joint with moderate OA showed a decreased potential in elderly patients aged 80 years or over. This report indicates that the intra-articular PRP injection for patients with TMJ-OA can be performed in accordance with the physiological conditions and clinical diseases of patients. Because autologous PRP is prepared from the patient's own blood, the concentrated components of PRP differ according to the physiological conditions and clinical diseases of patients. For example, if PRP is prepared from a patient with autoimmune diseases, such as rheumatoid arthritis, it may have highly concentrated pro-inflammatory cytokines to accelerate the progressive cartilage degeneration of the TMJ.

Therefore, it is important to standardize the clinical PRP preparation protocol for patients with TMJ-OA. Furthermore,

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standardized methods may include the number of platelets, timing and volume of PRP for injection according to the physiological conditions and clinical diseases of patients.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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