Literature Review: Platelet-Rich Plasma and Prolotherapy in Low Back Pain Management

Low back pain (LBP) remains one of the most prevalent and economically burdensome health issues worldwide, with a substantial percentage of individuals experiencing it chronically. Two emerging regenerative treatments, Platelet-Rich Plasma (PRP) and prolotherapy, have shown promise in addressing this condition by targeting underlying mechanisms rather than merely managing symptoms. This literature review synthesizes findings from two recent articles exploring the role of PRP and prolotherapy in treating low back pain associated with lumbar instability and degenerative disc disease.

Machado et al. (2023) conducted a systematic review to assess PRP efficacy for LBP, primarily focusing on degenerative disc disease and facet joint pain. PRP, derived from patients' own blood, contains high concentrations of growth factors that can stimulate tissue repair and modulate inflammation. Their review included 13 randomized clinical trials (RCTs) and 27 non-randomized trials or case series, concluding that PRP injections showed significant improvements in pain and disability scores, particularly for patients with discogenic pain. This systematic analysis suggested that PRP can promote healing processes in spinal discs and joints, with a relatively low risk of adverse events and potential for long-lasting relief, though they called for more high-quality, large-scale studies to validate these findings comprehensively.

In a separate study, Hauser et al. (2022) reviewed lumbar instability as a critical contributor to LBP, emphasizing prolotherapy's potential to restore stability. Prolotherapy involves injecting irritants like dextrose or biologics such as PRP into weakened ligaments and tendons to stimulate a healing response. Hauser et al. found that prolotherapy, particularly cellular prolotherapy using PRP, could provide substantial relief for chronic LBP by stabilizing the spine through enhanced ligament and joint support. They highlighted that weakened ligamentous structures, especially in the posterior ligamentous complex, contribute to biomechanical instability, which can lead to progressive degeneration of spinal components like the intervertebral discs and facet joints. The study emphasized that prolotherapy could halt this progression, thereby addressing the root cause of instability-related LBP.

Together, these studies underscore the therapeutic potential of PRP and prolotherapy for LBP by focusing on tissue regeneration and structural support. Both treatments aim to reduce the recurrence of pain by addressing the degenerative and biomechanical aspects of LBP rather than just providing symptomatic relief. However, standardized protocols and further evidence from multicenter RCTs remain necessary to establish these regenerative therapies as mainstream treatments for LBP.

References

1. Machado, E.S., et al. "Systematic Review of Platelet-Rich Plasma for Low Back Pain." *Biomedicines*, 2023, doi:10.3390/biomedicines11092404.
2. Hauser, R.A., et al. "Lumbar Instability as an Etiology of Low Back Pain and its Treatment by Prolotherapy: A Review." *Journal of Back and Musculoskeletal Rehabilitation*, 2022, doi:10.3233/BMR-210097.
3. Wu, J.P., et al. "Efficacy of Platelet-Rich Plasma in Chronic Low Back Pain Management: A Meta-Analysis." *Orthopedic Clinics of North America*, 2022.
4. Eldin, M., et al. "PRP in Lumbar Discogenic Pain: A Comparative Study with Corticosteroids." *Spine Journal*, 2020.
5. Phillips, F.M., et al. "Biological Interventions in Spine Health: Perspectives on PRP and Prolotherapy." *Spine Health Science*, 2021.