Check for updates

S Letter to the Editor

Shoulder & Elbow

Letter to Editor

Shoulder & Elbow
2026, Vol. 18(2) 342–343
© The Author(s) 2025
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/17585732251385485
journals.sagepub.com/home/sel
Sage

Dear Editor,

We read with great interest the recent publication by Azharuddin et al. entitled "Improved healing and functional outcome is seen at 12 months after injecting leukocyte rich-PRP in arthroscopically repaired labrum: A case-control study" published in *Shoulder & Elbow*.[1] The authors present compelling evidence demonstrating superior functional outcomes and enhanced labral healing following leukocyte-rich platelet-rich plasma (LR-PRP) injection at the labrum-bone interface during arthroscopic Bankart repair. While we commend the authors for their innovative approach to addressing this challenging clinical problem, we wish to highlight a critical methodological limitation that warrants discussion.

The imperative for platelet-rich plasma (PRP) characterization

The absence of detailed platelet and growth factor characterization in the PRP preparation represents a significant limitation that undermines the reproducibility and generalizability of the study findings. PRP is a complex biological therapeutic with inherent variability in composition, and its clinical efficacy is fundamentally dependent on the concentration and bioactivity of its constituent components, including platelets, leukocytes, and growth factors.[2,3]

The therapeutic mechanisms of PRP are mediated through the release of bioactive molecules such as platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), transforming growth factor-β (TGF-β), and insulin-like growth factor-1 (IGF-1).[4] Without quantitative assessment of these parameters, it remains unclear whether the observed improvements in labral height, slope, and functional scores are attributable to an optimal PRP formulation or represent a general consequence of platelet activation and growth factor release.

Variability in PRP preparation and clinical implications

The heterogeneity in PRP preparation protocols has been well-documented in the literature, with significant variations in centrifugation parameters, platelet concentration factors, and leukocyte content leading to disparate clinical outcomes.[5,6] The authors' use of LR-PRP introduces additional complexity, as the presence of leukocytes contributes inflammatory mediators that may exert both beneficial and detrimental effects on tissue healing.[7] The dual nature of leukocyte involvement—promoting initial inflammatory responses while potentially inhibiting subsequent healing phases—necessitates careful characterization to understand the net therapeutic effect.

The study protocol mentions PRP activation using a platelet agitator for 30 minutes, but lacks specification regarding the use of external activators such as calcium chloride or thrombin. The activation methodology critically influences growth factor release kinetics and bioavailability, representing another variable that could significantly impact clinical outcomes.[8]

Considerations for enhanced PRP research methodology

Based on existing literature documenting the variability and inconsistency in PRP research outcomes, several methodological considerations emerge that could strengthen future investigations in this field.

Platelet quantification standards

Multiple studies have demonstrated significant variability in platelet concentration reporting across PRP research. Standardized platelet counting using automated hematology analyzers, as employed in hematological research, could provide more consistent baseline measurements for comparative analysis between studies.

Growth factor documentation

The therapeutic mechanisms of PRP have been attributed to specific bioactive molecules, particularly PDGF, VEGF, and TGF-β. Previous research has shown considerable variation in growth factor concentrations between different PRP preparations, suggesting that documentation of these parameters could enhance understanding of treatment mechanisms and facilitate comparison across studies.

Activation protocol specification

Studies examining PRP activation methods have reported that the choice of activation approach significantly influences growth factor release patterns. Detailed reporting of activation methodology, including the use and concentration of activating agents, could improve the reproducibility of research protocols.

These considerations reflect documented challenges in PRP research rather than prescriptive requirements. The heterogeneity observed in current PRP literature suggests that addressing these methodological aspects could contribute to more consistent and interpretable research outcomes in regenerative orthopedic applications.

Clinical translation and reproducibility

The absence of PRP characterization data significantly hampers the translation of these promising findings into clinical practice. Clinicians attempting to replicate this treatment approach lack the necessary information to prepare PRP with comparable biological activity, potentially leading to inconsistent clinical outcomes. This limitation is particularly concerning given the growing adoption of PRP therapies in orthopedic practice and the need for evidence-based treatment protocols.

Conclusion

While the study by Azharuddin et al. represents an important contribution to the field of regenerative orthopedic surgery, the lack of comprehensive PRP characterization represents a critical gap that limits the scientific impact and clinical applicability of their findings. We strongly encourage the authors to consider supplementary analyses addressing these parameters or, at minimum, acknowledge these limitations in future publications. The field of regenerative medicine demands rigorous characterization of biological therapeutics to ensure reproducibility, optimize clinical outcomes, and facilitate evidence-based practice. As PRP continues to gain traction in orthopedic applications, standardized reporting of biological composition and activity will be essential for advancing the field and ensuring patient safety and treatment efficacy. We appreciate the opportunity to contribute to this important scientific discourse and hope that our comments will foster continued improvement in the quality and rigor of PRP research in orthopedic surgery.

Madhan Jeyaraman, Naveen Jeyaraman and Swaminathan Ramasubramanian
1Department of Orthopaedics, ACS Medical College and Hospital, Dr MGR Educational and Research Institute, Chennai, India
2Department of Regenerative Medicine, Agathisha Institute of Stemcell and Regenerative Medicine (AISRM), Chennai, India

Madhan Jeyaraman, Department of Orthopaedics, ACS Medical College and Hospital, Dr MGR Educational and Research Institute, Chennai, TN 600077, India; Department of Regenerative Medicine, Agathisha Institute of Stemcell and Regenerative Medicine (AISRM), Chennai, India.
Email: madhanjeyaraman@gmail.com

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ORCID iDs

Madhan Jeyaraman https://orcid.org/0000-0002-9045-9493
Naveen Jeyaraman https://orcid.org/0000-0002-4362-3326

References

1. Azharuddin S, Gahlot N, Elhence A, et al. Improved healing and functional outcome is seen at 12 months after injecting leukocyte rich-PRP in arthroscopically repaired labrum: a case-control study. *Shoulder Elbow* 2025: 17585732251319259.
2. Andia I and Abate M. Platelet-rich plasma: combinatorial treatment modalities for musculoskeletal conditions. *Front Med* 2021; 8: 615251.
3. Lana JF, Weglein A, Sampson SE, et al. Randomized controlled trials of platelet-rich plasma: clinically relevant or just laboratory based? *J Orthop Res* 2019; 37: 532–542.
4. Pavlovic V, Ciric M, Jovanovic V, et al. Platelet rich plasma: a short overview of certain bioactive components. *Open Med* 2016; 11: 242–247.
5. Magalon J, Chateau AL, Bertrand B, et al. DEPA classification: a proposal for standardising PRP use and a retrospective application of available devices. *BMJ Open Sport Exerc Med* 2016; 2: e000060.
6. Mautner K, Malanga GA, Smith J, et al. A call for a standard classification system for future biologic research: the rationale for new PRP nomenclature. *PM R* 2015; 7(4 Suppl): S53–S59.
7. Cavallo C, Roffi A, Grigolo B, et al. Platelet-rich plasma: the choice of activation method affects the release of bioactive molecules. *Biomed Res Int* 2016; 2016: 6591717.
8. Nurden AT, Nurden P, Sanchez M, et al. Platelets and wound healing. *Front Biosci* 2008; 13: 3532–3548.