Platelet-rich plasma versus hyaluronic acid for hip osteoarthritis: the relationship between outcomes and PRP preparation type

Aden Baksh, Jose Badillo, Pragna Talluri, Tanmay Patil, Matthew Martenson, PhD, Michael Guju, MD, Joseph Rinaldi, MD

Dept of Physical Medicine and Rehabilitation, University of Florida, Gainesville, FL United States

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Introduction

- Hip osteoarthritis (HOA) is a chronic degenerative joint disease characterized by cartilage loss, synovial inflammation, and subchondral bone remodeling, leading to pain and functional decline.
- It is a major cause of disability worldwide.
- Non-operative treatments used for symptom control and total hip arthroplasty reserved for end-stage disease.
- Orthobiologics have emerged as a potential treatment modality; however, evidence for their efficacy in HOA remains inconsistent.
- Platelet-rich plasma (PRP) has shown benefit in knee osteoarthritis, but limited and heterogeneous evidence exists in hip osteoarthritis.
- Differences in PRP preparation have been proposed as one potential source of this heterogeneity, yet no trials have compared leukocyte-rich and leukocyte-poor PRP.

Objectives & Purpose of Study

- To evaluate current evidence comparing intra-articular platelet-rich plasma (PRP) and hyaluronic acid (HA) injections for non-operative hip osteoarthritis, with particular attention to heterogeneity in PRP preparation, including leukocyte content.
- To map instrument-specific pain (VAS) and composite (WOMAC) outcomes according to PRP preparation type (leukocyte-poor, leukocyte-rich, or unspecified) across seven trials comparing PRP with HA.

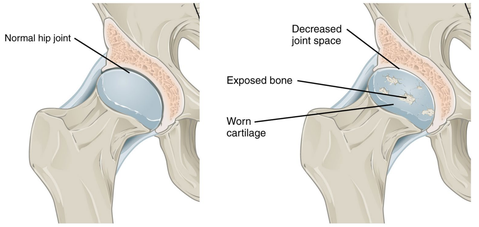
Methods

- Structured literature review conducted using PubMed, Google Scholar, and Cochrane Library.
- This secondary analysis used only previously published, deidentified aggregate data and involved no human subjects contact; exempt from IRB review per University of Florida policy.
- Search terms: "hip osteoarthritis," "platelet rich plasma (PRP)," "hyaluronic acid," "intra-articular injection," "leukocyte rich," "leukocyte poor."
- Inclusion: adults ≥18 with clinically or radiographically diagnosed HOA.
- PRP preparations classified by reported leukocyte content: leukocyte-poor, leukocyte-rich, or unspecified.
- Outcomes: pain (VAS) and function (WOMAC), and other clinical outcomes such as Harris Hip Score (HHS).
- Study types: randomized controlled trials (RCTs).
- Total studies included: 7 RCTs (n=480).
- Pooled outcome estimates (SMD) obtained from Sambe et al. (2023).
- Data extracted: outcomes, PRP preparation, and leukocyte content.

Results

- Pooled estimates (Sambe et al., 2023) showed no significant difference between PRP and HA at 1-2 months, a significant PRP advantage at 6 months (WOMAC pain SMD -0.38, p=.03; VAS SMD -0.50, p<.01), and no significant difference at 12 months (WOMAC SMD -0.85, p=.09; VAS SMD -0.22, p=.29) (Figure 2).
- Findings by preparation type showed no consistent pattern (Table 1): the two leukocyte-poor trials produced opposite results, the one leukocyte-rich trial showed no benefit, and unspecified-preparation trials were split, three favoring PRP, one showing no difference.
- Only 4 of 7 trials characterized leukocyte content at all, and none compared preparations directly.

Figure 1. Anatomy of Hip Osteoarthritis



Comparison of normal and osteoarthritic hip joint anatomy highlighting cartilage degeneration and joint space narrowing [7].

Table 1. PRP vs HA Findings by Preparation Category and Instrument

Study	PRP Category	n (PRP/HA)	WOMAC	VAS	Other
Di Sante 2016 [3]	**Leukocyte-poor**	43 (21/22)	HA favored (group p<.0001)	HA > PRP (p=.0004, 16wk)	NR
Kraeutler 2021 [5]	**Leukocyte-poor**	33 (19/14)*	NS (0/6/12/24wk)	NR	PRP delayed THA conv. (15.8% vs 50.0%, p=.035)
Battaglia 2013 [1]	**Leukocyte-rich**	100 (50/50)	NR	NS	HHS: NS
Dallari 2016 [2]	**Not specified**	80 (44/36)†	PRP > HA thru 6mo (p=.009); NS at 12mo	PRP > HA (p<.03; 2/6/12mo)	HHS: NS
Doria 2017 [4]	**Not specified**	80 (40/40)	NS	NS	HHS: NS
Nouri 2022 [6]	**Not specified**	70 (35/35)†	PRP > HA (p=.041, 6mo)	NS	Lequesne: PRP > HA (p=.001, 6mo)
Villanova 2020 [9]	**Composition analyzed**	74 (38/36)	NS	NS	HHS: PRP > HA (p<.05, 12mo)

Leukocyte-poor Leukocyte-rich Not specified / composition analyzed

*NS = no significant difference. NR = not reported. *Kraeutler n reported in hips (34 patients, 36 hips enrolled; 33 hips analyzed).*
†Dallari and Nouri were 3-arm trials (PRP, HA, PRP+HA); n and findings shown are for the PRP vs HA arms only.

Figure 2. PRP vs HA findings across the seven included RCTs, grouped by preparation category.

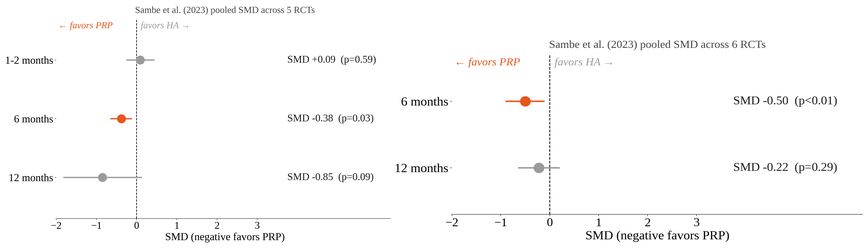


Figure created by authors using pooled standardized mean difference data from Sambe et al. (2023).

Clinical Implications

- PRP may offer a mid-term (6-month) pain advantage over HA, not sustained at 12 months.
- The optimal PRP preparation for hip osteoarthritis remains unclear, given this inconsistency across preparation types.
- Heterogeneity in PRP preparation and inconsistent reporting standards (e.g., Minimum Information Necessary for Studies Evaluating Biologics in Orthopaedics) limit comparability and clinical adoption.
- Standardized PRP characterization and head-to-head hip osteoarthritis trials are needed to resolve this uncertainty.

References

- [1] Battaglia, M., Guaraldi, F., Vannini, F., Rossi, G., Timoncini, A., Buda, R., & Giannini, S. (2013). Efficacy of ultrasound-guided intra-articular injections of platelet-rich plasma versus hyaluronic acid for hip osteoarthritis. Orthopedics, 36(12), e1501-e1508. https://doi.org/10.3928/01477447-20131120-13
- [2] Dallari, D., Stagni, C., Rani, N., Sabbioni, G., Pelotti, P., Torricelli, P., Tschon, M., & Giavaresi, G. (2016). Ultrasound-guided injection of platelet-rich plasma and hyaluronic acid, separately and in combination, for hip osteoarthritis: A randomized controlled study. American Journal of Sports Medicine, 44(3), 664-671. https://doi.org/10.1177/0363546515620383
- [3] Di Sante, L., Villani, C., Santilli, V., Valeo, M., Bologna, E., Imparato, L., Paoloni, M., & Iagnocco, A. (2016). Intra-articular hyaluronic acid vs platelet-rich plasma in the treatment of hip osteoarthritis. Medical Ultrasonography, 18(4), 463-468. https://doi.org/10.11152/mu-874
- [4] Doria, C., Mosele, G. R., Caggiari, G., Puddu, L., & Ciurlia, E. (2017). Treatment of early hip osteoarthritis: Ultrasound-guided platelet rich plasma versus hyaluronic acid injections in a randomized clinical trial. Joints, 5(3), 152-155. https://doi.org/10.1055/s-0037-1605584
- [5] Kraeutler, M. J., Houck, D. A., Garabekyan, T., Miller, S. L., Dragoo, J. L., & Mei-Dan, O. (2021). Comparing intra-articular injections of leukocyte-poor platelet-rich plasma versus low-molecular weight hyaluronic acid for the treatment of symptomatic osteoarthritis of the hip: A double-blind, randomized pilot study. Orthopaedic Journal of Sports Medicine, 9(1). https://doi.org/10.1177/2325967120969210
- [6] Nouri, F., Babaee, M., Peydayesh, P., Esmaily, H., & Raeissadat, S. A. (2022). Comparison between the effects of ultrasound guided intra-articular injections of platelet-rich plasma (PRP), high molecular weight hyaluronic acid, and their combination in hip osteoarthritis: A randomized clinical trial. BMC Musculoskeletal Disorders, 23(1), 856. https://doi.org/10.1186/s12891-022-05787-8
- [7] OpenStax. (2016). 0910 osteoarthritis hip [Image]. Wikimedia Commons. https://commons.wikimedia.org/wiki/File:0910_Oaeoarthritis_Hip.jpg
- [8] Sambe, H. G., Yasir, M., Man, R. K., Gogikar, A., Nanda, A., Janga, L. S. N., & Hamid, P. (2023). Comparing intra-articular platelet-rich plasma with hyaluronic acid for the treatment of hip osteoarthritis: A systematic review and meta-analysis. Cureus, 15(10), e47919. https://doi.org/10.7759/cureus.47919
- [9] Villanova-López, M. M., Núñez-Núñez, M., Fernández-Prieto, D., González-López, C., García-Donaire, J., Pérez-Pérez, A., Sandoval Fernández del Castillo, S., Murillo-Izquierdo, M., Camean-Fernández, M., Gutiérrez-Pizarraya, A., Navas-Iglesias, N., Roca-Ruiz, L. J., Calleja-Hernández, M. Á., & Ballester-Alfaro, J. J. (2020). Randomized, double-blind, controlled trial, phase III, to evaluate the use of platelet-rich plasma versus hyaluronic acid in hip coxarthrosis. Revista Española de Cirugía Ortopédica y Traumatología (English ed.), 64(2), 134-142. https://doi.org/10.1016/j.recot.2019.09.008