



Canadian Agency for
Drugs and Technologies
in Health

RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS



TITLE: Platelet Rich Plasma Lumbar Disc Injections for Lower Back Pain: Clinical Effectiveness, Safety, and Guidelines

DATE: 21 February 2014

RESEARCH QUESTIONS

1. What is the clinical effectiveness of platelet rich plasma lumbar disc injections for the treatment of lower back pain?
2. What is the clinical evidence on the safety and harms of platelet rich plasma lumbar disc injections for the treatment of lower back pain?
3. What are the evidence-based guidelines regarding the use of platelet rich plasma lumbar disc injections for the treatment of lower back pain?

KEY MESSAGE

One systematic review, one randomized controlled trial, two non-randomized studies, and one evidence-based guideline were identified regarding platelet rich plasma lumbar disc injections for the treatment of lower back pain.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2014, Issue 1), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2009 and February 10, 2014. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One systematic review, one randomized controlled trial, two non-randomized studies, and one evidence-based guideline were identified regarding platelet rich plasma lumbar disc injections for the treatment of lower back pain. No health technology assessments were identified. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

While the use of autologous platelet-rich plasma (PRP) has increased for numerous orthopedic conditions,⁵ most of the identified literature^{1,2,4,5} underlined the uncertainty surrounding its clinical^{1,4,5} or economic² benefit. The systematic review reported that the lack of standardized outcomes, study protocols, platelet-separation techniques, and the non-significance of outcome measures resulted in increased ambiguity surrounding its use for the treatment of orthopedic bone and soft tissue injuries.¹ The authors of one randomized study concluded that the addition of PRP with autologous bone in posterior lumbar interbody fusion surgery was justified from a clinical and radiological aspect; however, it could not be economically justified due to lack of statistical significance in outcome measures.² Authors of a non-randomized study noted that, while autologous PRP appeared to involve very little risk to patients, clinical benefit remained uncertain with regard to its use in patients undergoing anterior spinal fusion, even though there were implications of faster fusion and higher density values.⁴ One of the four included studies resulted in the conclusion that autologous PRP-serum was both safe and effective for up to six months post-treatment in patients with discogenic low back pain; however, this was a non-comparative, non-randomized study that involved a small number of patients (n=6).³

The identified guideline indicates that, despite the increase in the use of autologous PRP for various orthopedic conditions, there remains a paucity of reliable clinical evidence to guide its use and that the variability of clinical benefit needs to be addressed with an investigation of the differences between products.⁵

REFERENCES SUMMARIZED

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

1. Sheth U, Simunovic N, Klein G, Fu F, Einhorn TA, Schemitsch E, et al. Efficacy of autologous platelet-rich plasma use for orthopaedic indications: a meta-analysis. *J Bone Joint Surg Am.* 2012 Feb 15;94(4):298-307.
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Randomized Controlled Trials

2. Sys J, Weyler J, Van Der ZT, Parizel P, Michielsen J. Platelet-rich plasma in mono-segmental posterior lumbar interbody fusion. *Eur Spine J [Internet].* 2011 Oct [cited 2014 Feb 20];20(10):1650-7. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3175872>
[PubMed: PM21744284](#)

Non-Randomized Studies

3. Akeda K, Imanishi T, Ohishi K, Masuda K, Uchida A, Sakakibara T, Kasai Y, Sudo A. Intradiscal injection of autologous serum isolated from platelet-rich-plasma for the treatment of discogenic low back pain: preliminary prospective clinical trial: Gp141. *Spine: Affiliated Society Meeting Abstracts [Internet].* 2011 Oct [cited 2014 Feb 6]. Available from:
http://journals.lww.com/spinejournalabstracts/Fulltext/2011/10001/Intradiscal_Injection_of_Autologous_Serum_Isolated.138.aspx.
4. Hartmann EK, Heintel T, Morrison RH, Weckbach A. Influence of platelet-rich plasma on the anterior fusion in spinal injuries: a qualitative and quantitative analysis using computer tomography. *Arch Orthop Trauma Surg.* 2010 Jul;130(7):909-14.
[PubMed: PM19949805](#)

Guidelines and Recommendations

5. Hsu WK, Mishra A, Rodeo SR, Fu F, Terry MA, Randelli P, et al. Platelet-rich plasma in orthopaedic applications: evidence-based recommendations for treatment. *J Am Acad Orthop Surg.* 2013 Dec;21(12):739-48.
[PubMed: PM24292930](#)

PREPARED BY:

Canadian Agency for Drugs and Technologies in Health
Tel: 1-866-898-8439
www.cadth.ca

APPENDIX – FURTHER INFORMATION:

Non-Randomized Studies – Platelet Gel/Glue

6. Landi A, Tarantino R, Marotta N, Ruggeri AG, Domenicucci M, Giudice L, et al. The use of platelet gel in postero-lateral fusion: preliminary results in a series of 14 cases. *Eur Spine J* [Internet]. 2011 May [cited 2014 Feb 20];20 Suppl 1:S61-S67. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3087038>
[PubMed: PM21416280](#)
7. Tsai CH, Hsu HC, Chen YJ, Lin MJ, Chen HT. Using the growth factors-enriched platelet glue in spinal fusion and its efficiency. *J Spinal Disord Tech*. 2009 Jun;22(4):246-50.
[PubMed: PM19494743](#)

Review Articles

8. Wang SZ, Rui YF, Tan Q, Wang C. Enhancing intervertebral disc repair and regeneration through biology: platelet-rich plasma as an alternative strategy. *Arthritis Res Ther*. 2013;15(5):220.
[PubMed: PM24165687](#)
9. Pneumaticos SG, Triantafyllopoulos GK, Chatziioannou S, Basdra EK, Papavassiliou AG. Biomolecular strategies of bone augmentation in spinal surgery. *Trends Mol Med*. 2011 Apr;17(4):215-22.
[PubMed: PM21195666](#)
10. Weglein AD. Focused review: current trends in platelet-rich plasma injection treatments. *JNR* [Internet]. 2011 [cited 2014 Feb 6];1(S1):95-7. Available from: <https://neurosurgicalreview.com/2012/03/focused-review-current-trends-in-platelet-rich-plasma-injection-treatments-2/>.

Additional References

11. Terry, A., Lutz, G, et al. Lumbar intradiscal platelet rich plasma injections: a prospective, double-blind, randomized controlled trial. International Spine Intervention Society 21st Annual Scientific Meeting research abstracts. *Pain Medicine*. 2013;14:1269–1276.
12. Hoggatt J. Hot ortho-biologic topics at AAOS 2011 dagger: platelet-rich plasma and related growth factors generate excitement. *BioDrugs*. 2011 Jun 1;25(3):197-202.
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