

## **Effect of Leukocyte Concentration on the Efficacy of Platelet-Rich Plasma in the Treatment of Knee Osteoarthritis.**

[Riboh JC](#)<sup>1</sup>, [Saltzman BM](#)<sup>2</sup>, [Yanke AB](#)<sup>2</sup>, [Fortier L](#)<sup>3</sup>, [Cole BJ](#)<sup>2</sup>.

Author information:

- <sup>1</sup>Division of Sports Medicine, Rush University Medical Center, Chicago, Illinois, USA [jriboh@gmail.com](mailto:jriboh@gmail.com).
- <sup>2</sup>Division of Sports Medicine, Rush University Medical Center, Chicago, Illinois, USA.
- <sup>3</sup>Cornell School of Veterinary Medicine, Ithaca, New York, USA.

### **Abstract**

#### **BACKGROUND:**

Leukocyte-poor platelet-rich plasma (LP-PRP) is hypothesized to be more suitable for intra-articular injection than leukocyte-rich PRP (LR-PRP) in the treatment of knee osteoarthritis.

#### **PURPOSE:**

To compare clinical outcomes and rates of adverse reactions between LP-PRP and LR-PRP for this application.

#### **STUDY DESIGN:**

Meta-analysis.

#### **METHODS:**

The MEDLINE, EMBASE, and Cochrane databases were reviewed. The primary outcome was the incidence of local adverse reactions. Secondary outcomes were the changes in International Knee Documentation Committee (IKDC) subjective score and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score between baseline and final follow-up measurements. A Bayesian network meta-analysis was performed, with a post hoc meta-regression to correct for baseline differences in WOMAC scores. Treatment rankings were based on surface under the cumulative ranking (SUCRA) probabilities.

#### **RESULTS:**

Included in the analysis were 6 randomized controlled trials (evidence level 1) and 3 prospective comparative studies (evidence level 2) with a total of 1055 patients. Injection of LP-PRP resulted in significantly better WOMAC scores than did injection of hyaluronic acid (mean difference, -21.14; 95% CI, -39.63 to -2.65) or placebo (mean difference, -17.84; 95% CI, -34.95 to -0.73). No such difference was observed with LR-PRP (mean difference, -14.28; 95% CI, -44.80 to 16.25). All treatment groups resulted in equivalent

IKDC subjective scores. The SUCRA analysis showed that LP-PRP was the highest ranked treatment for both measures of clinical efficacy (WOMAC and IKDC). Finally, PRP injections resulted in a higher incidence of adverse reactions than hyaluronic acid (odds ratio, 5.63; 95% CI, 1.38-22.90), but there was no difference between LR-PRP and LP-PRP (odds ratio, 0.78; 95% CI, 0.05-11.93). These reactions were nearly always local swelling and pain, with a single study reporting medical side effects including syncope, dizziness, headache, gastritis, and tachycardia (17/1055 total patients).

## **CONCLUSION:**

LP-PRP results in improved functional outcome scores compared with hyaluronic acid and placebo when used for treatment of knee osteoarthritis. LP-PRP and LR-PRP have similar safety profiles, although both induce more transient reactions than does hyaluronic acid. Adverse reactions to PRP may not be directly related to leukocyte concentration.

© 2015 The Author(s).