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Is Allogeneic PRP superior to a corticosteroid injection for the treatment of rotator cuff disease?

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The recent randomized study by Jo and colleagues compares allogeneic platelet-rich plasma (PRP) with a standard corticosteroid injection for the treatment of rotator cuff tears (1). We applaud the authors for their continued impactful work in this area; in this case a randomized controlled clinical trial (RCT). However, we found the conclusion statement “PRP slowly but steadily reduced pain and improved function in the shoulder until 6 months, whereas corticosteroid did not” (1), difficult to reconcile with the data presented in the study. The Constant score, along with safety, were defined as the primary outcome measures of the study in the publication and on clinicaltrials.gov (NCT02019537). The Constant score did not differ between groups at 6 months, while the corticosteroid injection was superior to PRP at 1 week and 1 month. In a small number of secondary outcome measures, PRP was significantly better at 6 months, but with such a robust set of measurements presented by the authors, the only statistical conclusions that

should be made were that both groups improved over time, and that the corticosteroid group did significantly better than PRP at early time points. However, the final conclusion favored PRP based on group differences in the DASH score, a questionnaire-based overall function score, and external rotation range of motion (ROM), only at the 6 month timepoint. These findings were heavily contrasted by no differences at the 6 month time point in the Constant, SPADI, ASES, UCLA, and SST scores, pain at rest, at motion, and at night, mean pain, worst pain, and forward flexion, abduction, and internal rotation ROMs, and strength measurements. Perhaps most importantly, there were no group differences in work impairments and overall satisfaction (1)

The conclusion (1) was amplified by the commentary-noting (2) that the clinical results demonstrated favorable improvements in pain and function in the PRP group (2). The commentary goes on to state that the findings of similar or slightly improved clinical efficacy and likely reduced adverse effects make allogeneic PRP an attractive option (2). As mentioned above, there was no superior clinical efficacy of PRP vs. corticosteroid because, to our knowledge, there is no scientific justification to assign higher weight to the DASH score at 6 months compared with other validated measures, or DASH time points. Furthermore, the original study did not demonstrate that adverse outcomes in PRP are more rare compared with corticosteroid (1). In addition, the highest and safest dose of PRP remains to be established before the field moves towards phase II trials. This is scientifically challenging because the mechanism-of-action and active ingredients in PRP are still largely unknown and unreported. Lastly, the commentary stated that several studies demonstrated safety and variable efficacy, albeit with increased cost compared with corticosteroids (2), citing a study by Hurley and colleagues (3). Hurley et al. demonstrated; 1) no effect of PRP in the short term, 2) PRP and corticosteroid injections do not differ at 6 months, and 3) that exercise therapy appears to be equally beneficial compared with PRP (3).
In summary, we believe that the RCT (1) was technically well-executed and an extremely valuable addition to the field, but the conclusions of the paper and ensuing published commentary (2) are speculative in the face of the data.

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References

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Conflict of Interest: None Declared

Article Author Response

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Article Author(s) to Letter Writer(s)

Dear Dr. Ruoss and all,

Thank you for your sincere interest to our study. As you know, despite a recent surge of studies about platelet-rich plasma (PRP) in various musculoskeletal diseases, outcomes and mechanisms of PRP are still controversial. One of important reasons for these would be the difference in PRPs used in different studies, And furthermore, lots of studies did not provide adequate or even minimal information about the PRPs used in the studies. As long as this diversity and uncertainty of PRPs exists, any data and findings in a study could hardly provide useful information about real effects of PRPs on certain diseases. To overcome this, we believed that allogeneic PRP prepared with controlled processes and characterized with appropriate information would eliminate problems related to the diversity and uncertainty of autologous PRPs, and thus we did this trial.

The simple, clear but strong message of the result of this trial is explicitly stated in the Results in the Abstract, as "The Constant score at 1 month did not significantly differ between the PRP and corticosteroid groups". In addition, it's again described in the conclusions as "…are not definitely superior to corticosteroid injections…….". We think that most of JBJS readers would adequately understand the meaning of this sentence about the primary outcome of this study.

Meanwhile, we do not think it's an appropriate attitude of a sincere scientist if he/she find somethings important, but not tell them as those 'somethings important' are not statistically read, mechanistically described or seen apparently ordered. As a researcher who has done lots of PRP studies with a very conservative way and very strict standards, I found series of clinical data in this study (and another studies too) favoring PRP, but without statistical significance. Therefore, I cannot help but describe those results and significance of this study in the discussion and conclusion but in a smaller voice. However, maybe in this part, you and I have different directions of view. In addition, when we follow up patients participated in this study after the end of the original trial, most patients with PRP are better in most aspects of clinical

evaluation than those with steroid whereas this is our anecdotal opinion which may need scientific confirmation.

And about the optimal dosage, and mode of action of PRP, those are what we are also looking for. I hope that this study would encourage following more qualified studies that could investigate them.

Hope my answer would resolve some of your concerns. And thank you again for your interest.

Best,

Chris Jo, MD