USE OF PLATELET RICH PLASMA FOR THE TREATMENT OF BICIPITAL TENDINOPATHY IN SPINAL CORD INJURY: A PILOT STUDY

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INTRODUCTION

Shoulder pain remains one of the most common complaints in the spinal cord injury (SCI) population. Several studies suggest that approximately 30-70% of people with SCI in the United States suffer from a debilitating level of shoulder pain. Often this pain is a consequence of shoulder tendinopathy resulting in impingement syndromes. Current treatment strategies include both non-operative and operative strategies, both of which have significant limitations. Given the importance for shoulder health in paraplegics using manual wheelchairs with increasing life expectancy, alternative treatments for shoulder pathology are needed.

Recently biologic medicine has gained popularity to address non-healing wounds and soft tissue injuries. Preliminary data suggests Platelet Rich Plasma (PRP) as a promising alternative treatment option for recalcitrant tendinopathies. Both in-vitro and clinical studies have demonstrated the safety and efficacy of PRP in the treatment of various tendinopathies, most notably in lateral epicondylitis. PRP contains powerful growth factors that initiate wound healing, including platelet derived growth factor, vascular endothelial growth factor, and epithelial growth factor. PRP has demonstrated accelerated bone graft formation in mandibular surgeries, improved fusion rates in spine surgery, and increased efficacy of knee and ankle surgeries. Emerging studies are now exploring the potential use of PRP in operative rotator cuff repair. Non-operative PRP studies have shown positive results in the treatment of lateral epicondylitis, infra-patellar tendonitis, and knee osteoarthritis.

METHODS

This novel pilot study was designed to explore the efficacy of PRP injections in the wheelchair population with biceps tendon pathology. Validated study outcomes included the Ultrasound Shoulder Pathology Rating Scale (USPRS), the Physical Examination of the Shoulder Scale (PESS) and the Visual Analogue Scale (VAS). Spinal cord injury athletes with chronic shoulder pain were recruited for this study. Members of the tetraplegic rugby and the wheelchair basketball teams at the National Rehabilitation Hospital were specifically targeted for recruitment because of the high prevalence (50%) of bicipital tendinopathy in this population. Participants in the study demonstrated AIS scores of A-D for at least one year, shoulder pain for at least six months and require the use of a manual wheelchair for the preceding year. Each participant enrolled underwent baseline analysis including USPRS, PESS, VAS and functional scores. Participants then underwent a unilateral biceps tendon sheath injection of PRP and were followed every two weeks to monitor VAS scores and adverse events. The study was concluded with an eight week follow up evaluation. The hypothesis was that an ultrasound guided tendon sheath PRP injection would result in a significant change in USPRS, PESS and VAS scores over the course of the eight-week study period.

RESULTS

The study analysis includes 8 participants who have completed the full course of treatment and analysis. Comparison of baseline and 8 week data using a non-parametric Wilcoxon Signed Ranks Test demonstrated significant change in the non-injected shoulder on USPRS score ($Z=2.207$, $p= 0.027$) in PESS score ($Z=2.120$, $p=0.034$)) and in the VAS-pain score ($Z=2.041$, $p=0.41$). Repeated measure General Linear Model analysis revealed statistically significant trends in the change of pain score measured via VAS at 5 time points (0,2,4,6,and 8 weeks) for injected arm ($F=6.68$, $p=0.061$) but not for the untreated arm. No adverse reactions were reported during the study period.

DISCUSSION

The initial pilot data from this study demonstrates a significant effect of PRP using relevant and standardized measures compared to the opposite extremity as a control. While the study sample is admittedly small, a non-parametric analysis demonstrates convincing data on the overall positive effect of PRP in the treatment of biceps tendinopathy in the spinal cord injury population. Given the study results, further investigation is warranted including a randomized control trial.