Heart of America Association of Blood Banks
A Discussion on the Benefits of Platelet Rich Plasma

When I was a young child, part of my joy growing up was watching Kobe Bryant of the Los Angeles Lakers tear through his opponents with a relentless fire. Night after night, Kobe seemed unstoppable on the basketball court. And while I grew older, it seemed like Kobe Bryant did not. Though he aged, his body held up remarkably well for someone who played at such a high level of intensity almost every single night of the NBA season. And he had quite a long career at that. Only a handful of NBA players have ever broken the twenty year mark that Kobe did. Often proclaimed to take meticulous care of his body, Kobe Bryant openly discussed how platelet rich plasma therapy helped him stay on the court. Since then, numerous athletes have used platelet rich plasma therapy to help them recover from various sports injuries. But how beneficial is the therapy? This paper will examine the details of platelet rich plasma as well as some of the current research on the topic.

So what is platelet rich plasma? In a nutshell, it's essentially exactly what it sounds like: plasma that is full of platelets. But producing it can be slightly more complicated. In the United States, platelet rich plasma is often made by collecting plasma and platelets from a single whole blood donation (Johns et al., 2015). This whole blood donation is centrifuged at a low relative centrifugal force, which allows the platelets to remain within the plasma portion of the blood. If the centrifugation speed is too high, the platelets will sink to the bottom of the collection along with the red blood cells and collecting them will prove to be difficult (Johns et al., 2015). After this low speed centrifugation, the collection of blood is placed in a machine that presses the platelets and plasma into a different collection bag, separating them away from the red blood cells. Next, this portion of platelets and plasma is further spun down, but this time at a higher centrifugation speed. This allows the platelets and plasma to be separated, which is then also pressed, leaving behind a smaller plasma portion that is rich in platelets. At minimum, the total volume of this final product will be somewhere between 40 and 70mL's and it must contain at least $5.5\ x\ 10^{10}$platelets (Johns et al., 2015). This concentrated platelet portion is allowed to rest

at room temperature for one hour. After this, the platelet rich plasma is stored at room temperature and remains viable for up to five days. While stored, the platelets must also be continually agitated in order to make sure that oxygen and carbon dioxide freely transfuse between the platelets and the storage bag (Johns et al., 2015). For general therapeutic procedures, only a few tubes of blood are taken from the patient and are immediately processed. And now that we have our platelet rich plasma, we're ready for our direct platelet injections. It is this product that is directly injected into specific areas of the body for targeted therapy.

Many years have passed since Kobe Bryant and other famous athletes helped shine a light on the benefits of platelet rich plasma therapy. And with the greater exposure over time, there have also been further research studies done to examine the efficacy of this therapy. In one study conducted by Sheth et al., (2018), there was seen to be a faster return to sports from injury when patients were treated with platelet rich plasma. 268 patients were included in this controlled study, all of whom had suffered from an acute grade I or II muscle injury. It was seen that patients who received platelet rich plasma therapy returned to their sport more than 5 days sooner than the controlled group that received no therapy. Additionally, the study also noted that there was no significant risk of reinjury after following up with patients at the six month mark (Sheth et al, 2018). And yet, despite the promising results of Sheth et al.'s study, other studies have shown less promising results for athletes hoping to return to their original form. In a study conducted by Altamura et al. (2020), patients suffering from osteoarthritis and cartilage degeneration in their knees were examined to see if platelet rich plasma therapy would allow them to return to their sport at the same level at which they started experiencing symptoms. In this study, 47 patients were injected with three injections of platelet rich plasma and were then followed up for 24 months to examine its efficacy. The study concluded that while patients did note improvements in both their functionality and reduction of pain in their knees, they were unable to compete athletically at the level of which they had performed previously (Altamura et

al., 2020). But while athletes may be unsatisfied by these results, there are many other patient populations where a reduction in arthritic pain would prove to be a significant improvement in their quality of life.

Rheumatoid Arthritis affects many people, both young and old. But recently, some studies have shown that platelet rich plasma may be a viable treatment option to aid in the relief of symptoms. In one study conducted by Saif et al., (2020), it was determined that platelet rich plasma therapy had a longer sustained therapeutic effect when compared to normal steroid treatments. In their study, 60 Rheumatoid Arthritis patients were divided into two groups of 30, with one group receiving treatments of steroids and the other receiving platelet rich plasma injected into articular joints. Their results indicated that those in the steroid treatment group experienced symptom relief for only three months, while those in the platelet rich plasma group were relieved of symptoms for six months (Saif et al., 2020). But another study from Darrow et al., (2019) has shown promising results in treating patients with lower back pain. In their study, 67 patients were separated into three groups, each receiving one, two or three platelet rich plasma injections respectively. And their conclusions were very encouraging, with each group progressively reporting a lesser pain scale relative to the amount of platelet rich plasma they received (Darrow et al., 2019). The results of these Rheumatoid Arthritis patients and those suffering from lower back pain provide hope to many people struggling with chronic pain ailments.

Ultimately, platelet rich plasma seems to support promising therapy opportunities to select populations, but further studies should be conducted to establish which patient groups are most benefited. While there may be some variance in the efficacy of treating athletes in returning to top form, the pain reducing effects of platelet rich plasma therapy may prove to be a benefit to many others suffering from chronic pain. Many years have passed since the late Kobe Bryant first started to use platelet rich plasma therapy. Whether his therapy sessions truly helped him stay on the court longer is still up for debate. Regardless, more and more athletes

have taken to the therapy with the hope of prolonging their careers. More recently, Harrison Bader and Miles Mikolas of our very own St. Louis Cardinals have also participated in platelet rich plasma therapy. And this greater exposure has only encouraged researchers to continue their study of platelet rich plasma and its potential benefits. As more research is conducted, this therapy can become further standardized to help many different therapeutic population groups. This is a promising outcome which may ultimately end up having a far greater scope than just helping athletes.

References

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