

## Platelet-Rich Plasma Therapy for Male and Female Pattern Hair Loss

Although platelet-rich plasma (PRP) has been used for various conditions for many years, it has only more recently become a widely used treatment for hair loss in the United States. Given the enormous amount of publicity it has received, patients are now frequently inquiring about it as a treatment option for their hair loss. As physicians, we rely on peer-reviewed studies to give our patients the best possible advice and therapeutic interventions to help their underlying medical problems. This article is an overview of the current status of PRP in the treatment of women and men with hair loss. It is based on a comprehensive review of the published data to date. In the PubMed database, any search results containing either “PRP” or “platelet rich plasma” in addition to “hair” or “alopecia,” were reviewed. Thirty-five studies that seemed relevant were then read and analyzed.

### The Rationale for Platelet-Rich Plasma to Treat Male and Female Pattern Hair Loss

Although recent studies have shown promising clinical results, the mechanism of action for PRP is not fully understood. It is known that platelets contain alpha granules that have various growth factors that are released upon activation, such as platelet-derived growth factor, transforming growth factor- $\beta$ , vascular endothelial growth factor, epidermal growth factor, fibroblast growth factor, and insulin-like growth factor-1 (IGF-1). It is believed that these are the driving force behind the increase in hair density and improved anagen:telogen ratio seen in clinical trials.<sup>1,2</sup> With respect to pattern hair loss, dihydrotestosterone is known to accelerate hair loss in susceptible follicles. Using a mouse model for androgenetic alopecia, it was shown that DHT blocked insulin-like growth factor-1, thus contributing to hair loss.<sup>3</sup> Platelet-rich plasma is a known source of IGF-1, which may partially explain its efficacy. Several studies analyzing human scalp

biopsies after treatment with PRP have shown epidermal thickening, increased number of hair follicles and follicular bulge cells, as well as improved vascularity.<sup>4–6</sup> All these factors are likely to contribute to the efficacy of PRP in pattern hair loss.

### How is Platelet-Rich Plasma Performed?

Platelet-rich plasma is performed as an outpatient. There are a variety of different systems used to perform PRP. This is an important variable since there is currently no standard technique or system used by physicians. The amount of blood drawn, concentration of PRP, and interval of time between treatments varies from medical facility to medical facility. Although data are lacking, the general consensus is that the concentration of platelets should be 4–6 times the normal concentration of platelets.

Blood is drawn from the patient. It is then centrifuged to separate out the plasma. Centrifuge settings vary depending on the PRP system used. Once separated, the platelet-poor plasma is usually discarded, then the PRP is drawn into 1-mL syringes and injected into the deep dermis/superficial subcutaneous tissue using a 27- or 30-gauge needle. The amount of PRP injected averages from 5 to 7 mL per treatment for male and female pattern hair loss. The interval for follow-up has not been firmly established but tends to vary from 1 to 6 months. Most patients are treated in 4- to 6-week intervals 3 to 4 times, and then the efficacy and need/schedule for continued treatment is judged 6 to 9 months after initial treatment.

### Post-Platelet-Rich Plasma Care

After a treatment, patients feel burning and stinging for 5 to 15 minutes. Patients are told to resume regular activities immediately but not to engage in rigorous exercise for 24 hours. This allows the PRP to be

absorbed into the hair-bearing scalp. After 24 hours, patients can resume all activities.

### **Efficacy of Platelet-Rich Plasma in the Treatment of Male and Female Pattern Hair Loss**

We reviewed current published data regarding the efficacy of PRP as a treatment for male and female pattern hair loss. To date, there are few placebo-controlled, randomized control trials published. Most that have been published lack a large enough sample size, long-term follow-up, and standardization of regimen to deduce any firm conclusion. There are a variety of clinical trials with follow-up ranging from 3 to 12 months, most of which demonstrate a positive impact after PRP. The benefit ranges from a slowing of hair loss, to thickening of existing hair follicles and hair density, with hair counts less commonly being impacted.

In the current literature, the number of treatments and interval between treatments is variable. Many different systems of PRP have been used as well. Thus, it is impossible to determine a standard of care with respect to PRP. One study reported that patients who received 3 monthly treatments reported a return of hair loss roughly 16 months from baseline.<sup>5</sup> Another study published results where hair density peaked at 3 months and declined between 3 and 12 months, although still elevated compared with baseline at the study's end.<sup>7</sup> These studies provide evidence for maintenance treatments.

To date, there are no known long-term side effects associated with PRP in the treatment of hair loss. There are rare reports of increased shedding in the first few weeks after treatment. It is likely that this is analogous to what is seen occasionally with minoxidil, where an early increase in hair loss is a sign of long-term positive impact, although an acceleration of male or female pattern hair loss cannot be ruled out.

### **Platelet-Rich Plasma Current Status**

Platelet-rich plasma is an important new treatment option in male and female pattern hair loss. It

appeals to patients concerned with reports of side effects of other medical therapies (especially post-finasteride syndrome), if compliance with daily use of a medication is an issue, or those simply wanting a more “natural” treatment option for their hair loss. Currently physicians cannot give a definitive recommendation regarding the likelihood of efficacy for an individual patient, but the body of evidence published to date shows a strong enough data supporting its use.<sup>8–10</sup> It is believed like other hair loss treatments to be more efficacious at earlier stages of alopecia.<sup>11</sup> Regardless, although some negative studies exist, they are outweighed by the positive results, and thus PRP warrants discussion in hair loss consultations for both men and women and is a safe monotherapy or adjunct to the more studied treatment options (finasteride, minoxidil, and low-level light therapy).<sup>12,13</sup>

### **Future Challenges**

Future well-designed randomized placebo-controlled trials with long-term follow-up are needed to standardize the platelet concentration, regimen, and maintenance that are most efficacious for PRP.

In addition, the role of PRP in the treatment of alopecia areata, telogen effluvium, and scarring alopecias needs to be defined. There are few published articles showing that PRP may be beneficial for these conditions but further studies are needed to better clarify the role of PRP.<sup>14,15</sup>

In addition, there has been discussion about a role for PRP with hair transplantation. Advocates have purported PRP as an optimal holding solution for grafts. Others use it as an adjunct to surgery to help maintain and thicken existing hair follicles and to help stimulate the growth of transplanted hair quicker. Future studies will clarify the role of PRP in hair transplantation whether as a holding solution, medical therapy to maintain or thicken existing hair, to help stimulate quicker growth of transplanted hair, or a combination of all three.<sup>16</sup>

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