

## Platelet Rich Plasma: Implications for doping?

Alexandra Fonseca

Platelet Rich Plasma (PRP) is exactly what its name suggests. The substance is a by-product of blood (plasma) that is rich in platelets. Until now, its use has been confined to the hospital setting. This was due mainly to the cost of separating the platelets from the blood (thousands) and the large amount of blood needed (one unit) to produce a suitable quantity of platelets. New technology permits the doctor to harvest and produce a sufficient quantity of platelets from only 55cc of blood drawn from the patient while they are having outpatient surgery.

PRP permits the body to take advantage of the normal healing pathways at a greatly accelerated rate. During the healing process, the body rushes many cells and cell-types to the wound in order to initiate the healing process. One of those cell types is platelets. Platelets perform many functions, including formation of a blood clot and release of growth factors (GF) into the wound.

These GF (platelet derived growth factors PGDF, transforming growth factor beta TGF, and insulin-like growth factor ILGF) function to assist the body in repairing itself by stimulating stem cells to regenerate new tissue. The more growth factors released sequestered into the wound, the more stem cells stimulated to produce new host tissue. Thus, one can easily see that PRP permits the body to heal faster and more efficiently.

A subfamily of TGF, is bone morphogenic protein (BMP). BMP has been shown to induce the formation of new bone in research studies in animals and humans. This is of great significance to the surgeon

who places dental implants. By adding PRP, and thus BMP, to the implant site with bone substitute particles, the implant surgeon can now grow bone more predictably and faster than ever before.

### **PRP has many clinical applications:**

Bone grafting for dental implants. This includes onlay and inlay grafts, sinus lift procedures, ridge augmentation procedures, and closure of cleft lip and palate defects.

Repair of bone defects creating by removal of teeth or small cysts.

Repair of fistulas between the sinus cavity and mouth.

**Safety:** PRP is a by-product of the patient's own blood; therefore, disease transmission is not an issue.

**Convenience:** PRP can be generated in the doctor's office while the patient is undergoing an outpatient surgical procedure, such as placement of dental implants.

**Faster Healing:** The super saturation of the wound with PRP, and thus growth factors, produces an increase of tissue synthesis and thus faster tissue regeneration.

**Cost effectiveness:** Since PRP harvesting is done with only 55cc of blood in the doctor's office, the patient need not incur the expense of the harvesting procedure in hospital or at the blood bank.

**Ease of use:** PRP is easy to handle and actually improves the ease of application of bone substitute materials and bone grafting products by making them more gel-like.

### **Implications for doping**

Some concern exists as to whether PRP treatments violate anti-doping rules, such as those maintained by the World Anti-Doping Agency. It is not clear if local injections of PRP can have a systemic impact on circulating cytokine levels, in turn affecting doping tests; it is also not clear whether PRP treatments have systemic anabolic effects or affect

performance. In January 2011, the World Anti-Doping Agency removed intramuscular injections of PRP from its prohibitions after determining that there is a "lack of any current evidence concerning the use of these methods for purposes of performance enhancement". In April 2014, Orioles first baseman Chris Davis, 28, underwent two PRP injections to speed the healing and recovery of an oblique injury. Left-hander Zach Britton had the procedure in his left shoulder in March 2012, according to the Baltimore Sun, and right-hander Dylan Bundy had the procedure last April before undergoing Tommy John surgery in June.

