Comparison of Platelet-Rich Plasma Systems and Acellular Bone Marrow: An In Vitro Study

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Each system tested performed differently, and the effect on tenocytes did not appear to be linked to platelet counts. The Autologous Conditioned Plasma system demonstrated the best response of the cells in this testing system. Authors’ address: Colorado State University, 300 West Drake Road, Fort Collins, CO 80523; e-mail: dfrisbie@colostate.edu. © 2011 AAEP.

1. Introduction
Degenerative tendon disease is a common clinical problem. Novel therapeutics including platelet-rich plasma and acellular bone marrow aspirate (ABMA) have been described clinically; however, comparisons to differentiate their effects on tenocytes or direct comparisons are lacking. Our goal was to compare the three most clinically relevant platelet-rich plasma products—Autologous Conditioned Plasma (ACP), Fibrivet and fPRP, and ABMA—with a plasma control.

2. Materials and Methods
Each of the tested products was assessed for the ability to concentrate platelets, white blood cells, and a number of growth factor concentrations (IGF-1, TGF-β, and PDGF-BB). The effect of each product on tenocyte proliferation and matrix production (hydroxyproline) was also assessed after a 72-hour period. All methods were commercially available.

3. Results
Only fPRP significantly increased the platelet concentration and IGF-1, TGF-β, and PDGF-BB concentrations when compared with controls. When the effects of the various methods were measured on tenocytes, only ACP increased the cell proliferation and matrix (hydroxyproline) when compared with controls. It is noteworthy that fPRP increased cell proliferation and ABMA matrix production in tenocytes when compared with controls.

4. Discussion
The side-by-side comparison of various clinical treatments suggested that there were significant differences between them. When the effect on the tenocyte is taken into account, ACP may have some of the most beneficial properties as tested.

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Disclosures
D.D.F. and C.W.M. are consultants for Arthrex.

Footnotes
*ACP® Arthrex, Bonita Springs, FL 34108.
+FibriVet® Zoalogix, South Hamilton, MA 01982.
fPRP® VetCell, Naples, FL 34108.