

## Treatment of Muscle Injuries by Local Administration of Autologous Conditioned Serum: A Pilot Study on Sportsmen with Muscle Strains

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### Abstract

Muscle injuries represent a major part of sports injuries and are a challenging problem in traumatology. Strain injuries are the most common muscle injuries after contusions. These injuries can lead to significant pain and disability causing time to be lost to training and competition. Despite the frequency of strain injuries the treatment available is limited and is generally not sufficient to enhance muscle regeneration efficiently when fast resumption of sport activity is a primary target. A number of growth factors play a specific role in regeneration and it has been proven that a previously described method of physically and chemically stimulating whole blood (to produce autologous conditioned serum) induces concentration increases in FGF-2, HGF, and TGF- $\beta$ 1. A preliminary study was conducted on muscle strain

injuries in professional sportsmen receiving either: 1. autologous conditioned serum (ACS) or 2. Actovegin/Traumeel<sup>®</sup> treatment as control. Assessment of recovery from injury was done by: 1. sport professional's ability to participate to 100% under competition conditions in their respective sport and 2. MRI analysis. A significant difference in the recovery time from injury was demonstrated:  $16.6 \pm 0.9$  in the ACS treated instead of  $22.3 \pm 1.2$  (mean  $\pm$  SEM) days in the Actovegin/Traumeel<sup>®</sup> control group ( $p = 0.001$ ). MRI analysis supported the observed acceleration of the lesion recovery time. We conclude that ACS injection is a promising approach to reduce the time to recovery from muscle injury.

### Key words

Growth factors · regeneration · FGF-2 · skeletal muscle