

Expressions of Myogenic Regulatory Factors associate with Muscle Strength Recovery after Acute Muscle Strain Injury in a Rat Gastrocnemius.

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Introduction

Muscle strain injury is one of the common injuries in sports. By using animal models, muscle strain injuries resulted in structural abnormalities, such as myofibrillar disruption, inflammation and Z-disk streaming. Although most of these previous studies focused on degenerations of skeletal muscles, regenerating process of strain injuries have not been extensively examined. The aims of this study were to clarify the temporal expression patterns of myogenic regulatory factors, MyoD and Myogenin, after acute muscle strain injuries in a Wistar rat. Especially, we focused on the relations of these expressions with isometric tetanic force.

Material and Methods

Acute muscle strain injury was induced to an *in vivo* rat gastrocnemius with a single eccentric contraction. After that treatment, we measured isometric tetanic torque of the ankle joint to evaluate the muscle's functional recovery. Western blot analysis was performed to examine expressions of MyoD and Myogenin to confirm molecular regeneration process.

Result

The isometric tetanic torque on day 3 after the acute muscle strain injury significantly reduced in comparison with the pre-treatment control. This force deficit completely recovered at day 5. Expression of MyoD was confirmed from 3 to 7 days after acute muscle strain injury. The expression of Myogenin was also detected from 3 to 7 days but the response was relatively slower than that of MyoD.

Conclusion

These data suggest that the MRFs (MyoD and Myogenin) expression seems to associate with the force recovery after the acute muscle strain injuries.

Key word: Muscle strain injury, Myogenic regulatory factors, Muscle regeneration