Tara D. Korbal
L2
LSU Health Sciences Center, New Orleans, LA

Jessica C. Rivera
LSUHSC, Department of Orthopaedic Surgery

"Measuring Muscle Tissue Trauma in Murine and In-Vivo Models"

Introduction:

Extremity trauma involving bone and soft tissue injury is prone to complications such as poor tissue healing, wound dehiscence, wound infection, fracture related infection, and fracture nonunion. Increased understanding of how the local traumatized tissue affects healing is needed to reduce frequency of complications. The aim of this research is to establish methods of measuring muscle tissue trauma using discarded muscle tissue. These methods are first optimized in a murine model.

Methods:

After 4 mice were euthanized, we dissected out the anterior compartment of the lower extremity. We also took the tibia because it proved too difficult to remove from the muscle. The samples were transferred in HBSS to the lab. We had 4 control muscles and 4 traumatized muscles. We traumatized the trauma group by clamping the muscle in 3 sections for 5 seconds each. We created a media made of DMEM, 1% "Zonker" antibiotic, and 0.1% Ampicillin. For 7 days we repeated the following procedure: We added 3cc of media to each sample in a 6 well plate. The 6 well plates were placed in a 37C incubator. The following day, 1-1.5cc of media were removed and placed in tubes for each well, which were stored in the freezer. The remainder of the media was discarded. A new 3cc of media was replaced. After the last day, the samples were weighed.

Results:

Enzyme linked immunosorbent assays for hepatocyte growth factor (HGF) and beta-fibroblast growth factor (b-FGF) and immunohistochemistry for endoglin (CD105) and transforming growth factor beta 1 (TGF-β1) will be performed to determine if these markers of muscle damage could be measured in sequential days' culture supernatants.

Discussion:

By optimizing in vitro measurements of muscle damage, these results can be extrapolated to additional study on how damaged muscle may be recovered. Additionally, these methods will be used to study human muscle which is damaged by orthopaedic trauma.