NEW METHOD TO ASSESS SKELETAL MUSCLE ATROPHY IN COLLAGEN INDUCED ARTHRITIS (CIA) MODEL

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Background: Muscle quality in rheumatoid arthritis (RA) is a new concept that involves morphological features and function. A measurement that associates cell morphology with clinical and physical parameters has not been reported in the literature. CIA is a RA mouse model characterized by loss of muscle mass similar to human RA, thereby it is a convenient model to study the disease impact in muscle physiology.

Objectives: Develop an index to measure the morphology of muscle fibers and correlate the morphological features with the muscle functional performance in CIA.

Methods: 18 DBA/1J mice were induced using complete Freund's adjuvant and a booster after 18 days induction. Along experimental phase, we evaluated muscle strength using grip strength test and clinical disease score after onset of disease. 16 healthy mice were used as control. After 25 days CIA induction, 8 CIA and 8 control mice were euthanized for evaluation in severe disease.

Results: We found 1.5% atrophic muscle fibers in control animals. Mild CIA showed the same atrophic muscle fibers percentage compared to control. However, severe CIA showed 11.8% of atrophic muscle fibers. Decrease muscle strength in CIA over time were associated with a greater atrophic muscle fiber proportion (p<0.05) and increased disease score (n=0.8; p=0.019). The index works as a threshold to separate normal, atrophic and hypertrophic muscle fibers. Frequency analysis and Pearson Correlations were used and statistical significance was considered as p<0.05.

References: