

Correlation between Functional Recovery and Cell Morphology Following Induced Tibialis Anterior Muscle Strain in Wister rats.

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Type of Participation: Search Study.

INTRODUCTION

- **Muscle injuries are the most common sports injuries.**

- 31% of all injuries.**

- 27% of total absenteeism from games due to injury.**

- **Sciatic Functional Index (SFI) is a valid method to assess lower limb recovery in rats after nerve or muscle injuries.**
- **Modified Movin score is a semi-quantitative 4-point scale to rate cell morphology.**



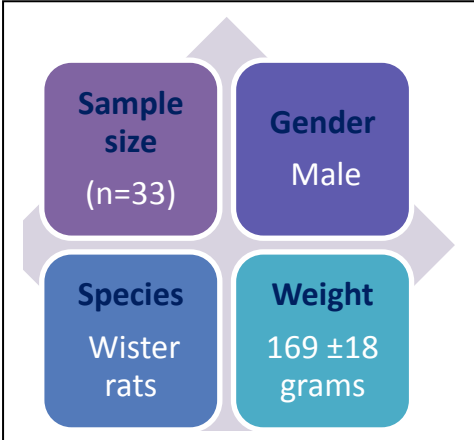
OBJECTIVE

To investigate the correlation between the functional recovery and the histological cell morphology of tibia

lis anterior (TA) muscle.

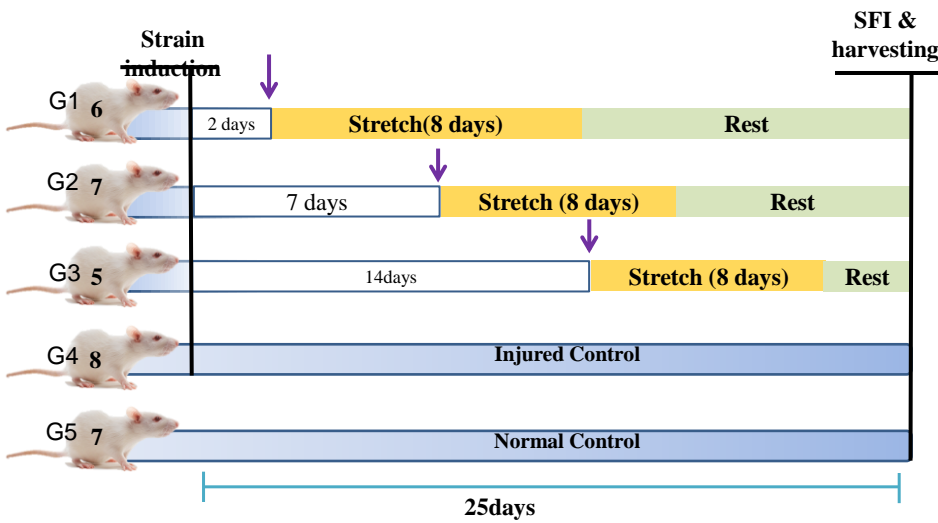
Methods

I. Animals



Methods

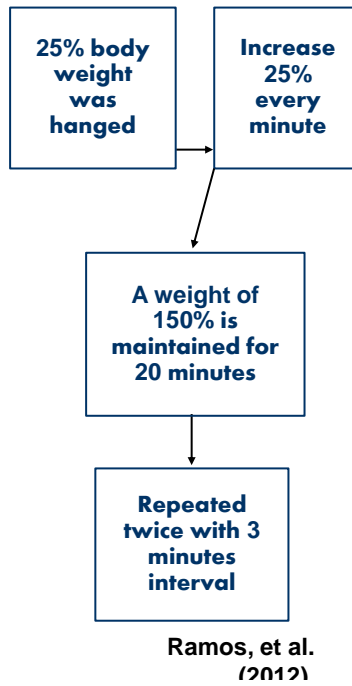
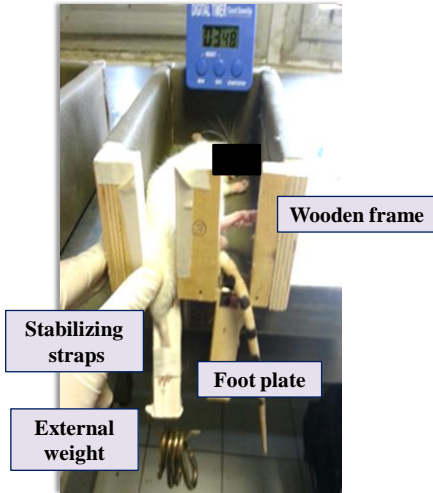
II .Timeline





Methods

III. Strain induction



Methods

IV .Stretching

Group I (Stretching 1st week)	
Group II (Stretching 2nd week)	
Group III (Stretching 3rd week)	



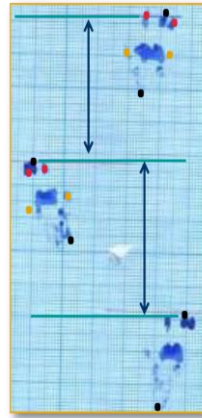
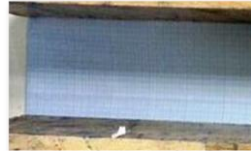
- Planter flexion & eversion
- 30 sec stretch, 30 sec rest

- 4 repetitions, once daily/8 consecutive days



Methods

V.SFI



$$SFI^3 = -38.3 \frac{EPL-NPL}{NPL} + 109.5 \frac{ETS-NTS}{NTS} + 13.3 \frac{EIT-NIT}{NIT} - 8.8$$

Bain, et al. (1989).



Methods

VI .SFI grading score

Index Range	Functional Rate	Statistical Code
(12) ----- (-12)	Excellent	5
(-13) ----- (-37)	Good	4
(-38) ----- (-62)	Average	3
(-63) ----- (-87)	Unsatisfactory	2
(-88) ----- (-112)	Complete Deficit	1
(-113) ----- (-137)	Worse Than	0



Methods

VII .Histological Scoring

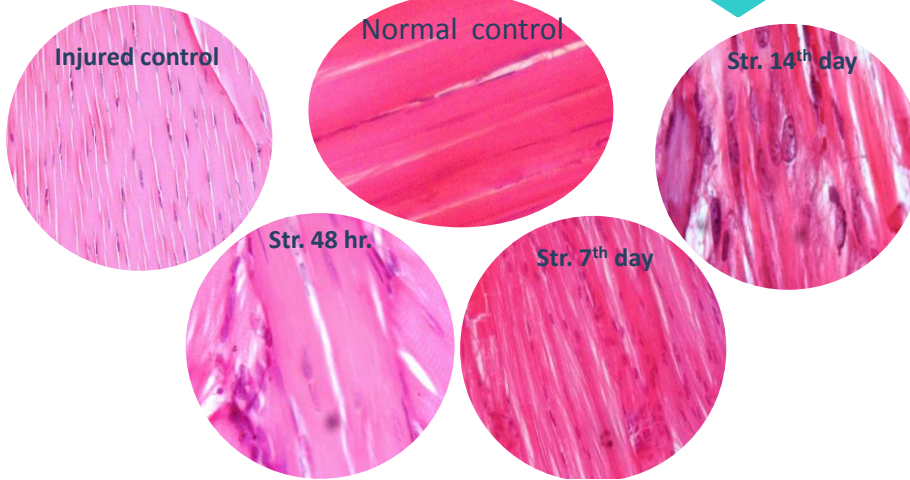
Items	Score recorded for each item
Fiber structure	Normal (0) Slightly abnormal (1) Abnormal (2) Markedly abnormal (3)
Fiber arrangement	
Rounding of the nuclei	
Regional variations in cellularity	
Vascularity	
Decreased collagen	



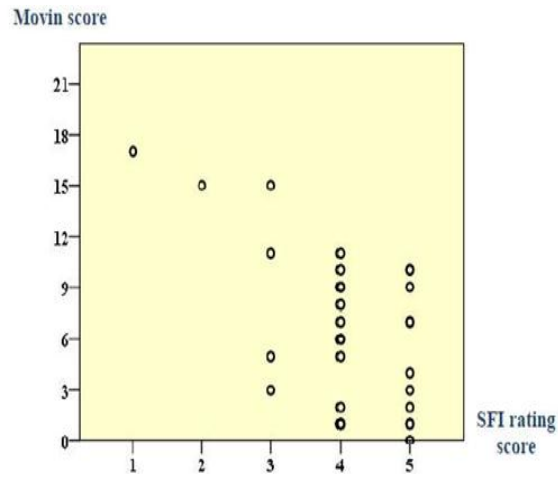
Methods

VIII .Histological Scoring

Maximally disorganized collagen with numerous enlarged nuclei and variations in stainability



Results



Conclusion

Changes in function following strain induced muscle injury associated to somewhat with tissue structural changes.

Future directions

- Correlate functional outcome with histomorphometric data.
- Investigate if the functional-histological correlation would be affected by healing stage.

Acknowledgement

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