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Male Vs Female Neuromuscular Tensiomyographic Characteristics Of The Lower Extremity In Competitive Soccer Players With Anterior Cruciate Ligament Injury

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Faculty Disclosure Information

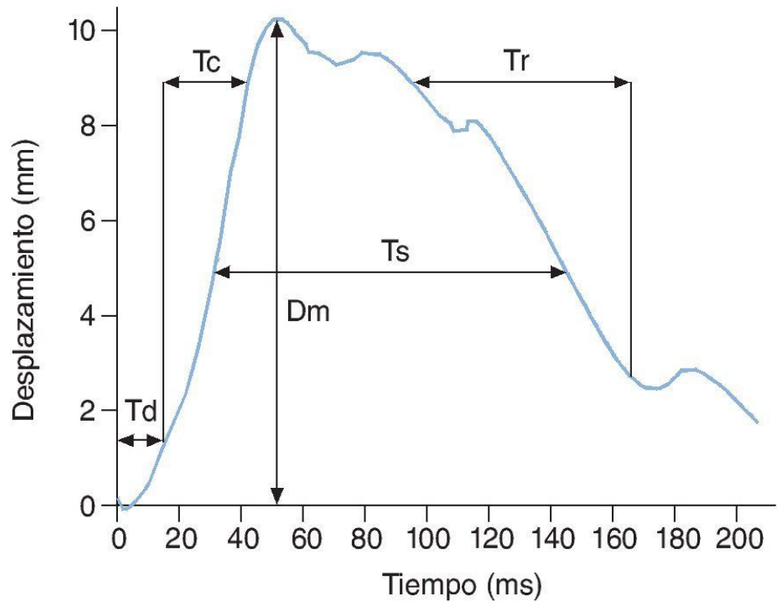
- Nothing to disclosure

Introduction

- ACL injuries are among the most severe and frequent injuries in soccer.
- Understanding injury mechanisms and risk factors is essential for effective prevention.
- **Gender-specific injury prevention programs may be required.**

Objective

To **compare** neuromuscular **tensiomyographic** (TMG) characteristics of the lower extremity in competitive **male and female soccer players with ACL injury.**



Methods

- Cross-sectional, controlled, between-group comparative study.
- Sample: **84 competitive soccer players** with ACL injury. 40 males + 44 females
- **Bilateral TMG assessment of the lower limbs.**

Results: Male Soccer Players

Increased Tc in injured limb compared to healthy limb:
VM, VL, RF, ST, BF.

No significant differences in Dm between limbs.

Results: Female Soccer Players

- **Increased Tc only in VL and RF.**
- Significant increase in **Dm in VL of injured limb.**
- Persistent atrophy of VL suggested

Symmetry Index

Between-limb symmetry index significantly lower (worse) in females vs males in:

- VM
- GM
- GL

Suggests **prolonged recovery time in female players**

Discussion

- Males show greater neuromuscular alterations post-ACL injury across multiple muscles.
- **Females present more localized alterations (VL, RF).**
- Increased Dm in females indicates muscle atrophy, especially in VL.
- Muscle recovery asymmetry more pronounced in females.

Limitations & Future Research

- Cross-sectional design limits causal inference.
- Future prospective studies required.
- Explore hormonal and biomechanical factors.
- Validate gender-specific rehabilitation protocols.

Clinical Implications

- Gender differences in muscle response post-ACL injury.
- **Rehabilitation** programs should be **gender-specific**.
- Special focus on **muscle asymmetries and recovery times in females.**

Conclusion

- Male players display broader neuromuscular deficits post-ACL injury.
- Female players show persistent muscle atrophy and worse symmetry index.
- Rehabilitation and prevention programs should consider gender-specific adaptations to optimize outcomes in soccer players.

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