AIT Research

Kinematic Characteristics of Resisted Sled Sprints Under Different Loading Conditions

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INTRODUCTION

- Resistance training exercises have been associated with improved sprint performance
- The principle of specificity states that training should be relevant and appropriate to the sport for which the athlete is training and may explain the limited transfer from traditional resistance training to improved sprint performance
- Considering the principle of specificity, the addition of an external load to the action of sprinting may offer a more specific form of resistance training for athletes
- AIM: To elucidate the specificity of resisted sled sprints (RSS) by examining the kinematic characteristics of RSS under different loading conditions and in different sporting populations

METHODS

Familiarization Session
- 33
- Sprinters n = 10
- Team Sport Athletes n = 23

Sprint Session
- 12 sprints at different loads (unloaded, 10, 20, 30% velocity decrement)
- Velocity measured with an electronic timing system (40m distance)
- Kinematics measured using High-Speed Cameras

Strength & Power Session
- One repetition maximum in hip thruster and back squat
- Countermovement and drop jumps

RESULTS

- Different loading conditions display different kinematics. Load significantly affected most kinematics within the two groups. There was no between group differences.
- Knee, hip, ankle, thigh, shank and foot angle reduced linearly with increasing loading conditions, trunk lean and contact times for field and sprint athletes increased linearly with increasing loading conditions (Figure 1).
- There was a significant change in ROM of the knee during ground contact. It seems possible that RSS may have increased the work contribution done at the knee joint.

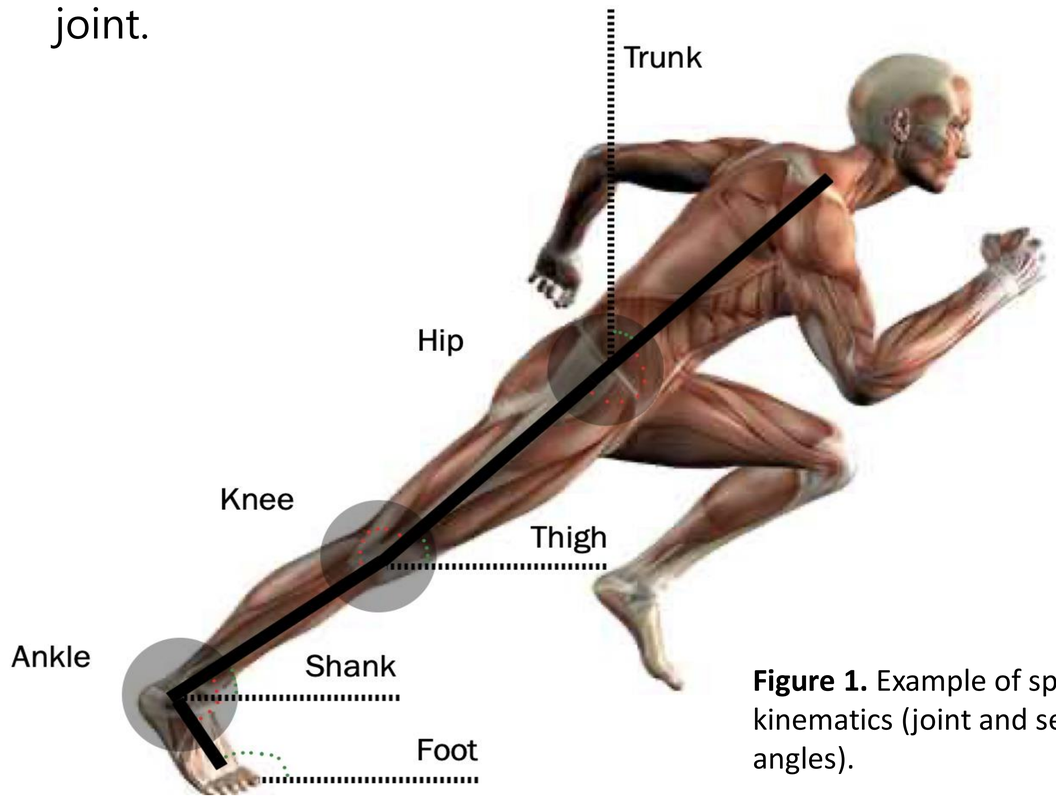

Figure 1. Example of sprinting kinematics (joint and segment angles).

CONCLUSION

- Not all loading conditions display similar kinematics and that different loads display different levels of specificity depending on the phase of sprinting assessed.
- Changes that were induced may have been positive changes such as increased trunk lean, enabling athletes to place themselves in an optimal position to maximize propulsive forces.
- Athletes were not getting into upright running. Thus, instead extending the distance over which it is possible to train acceleration.

Refenrences

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SPORT HEALTH EXERCISE