Isokinetic Evaluation of Ankle Strength and Fatigue Among ECSU Women's Soccer

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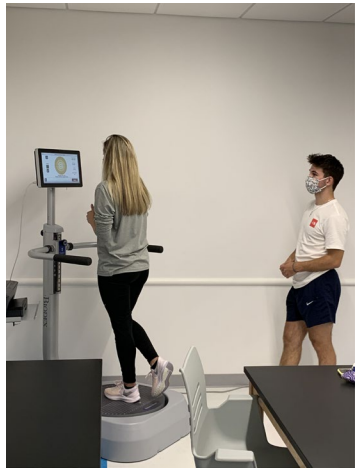
Introduction and Purpose

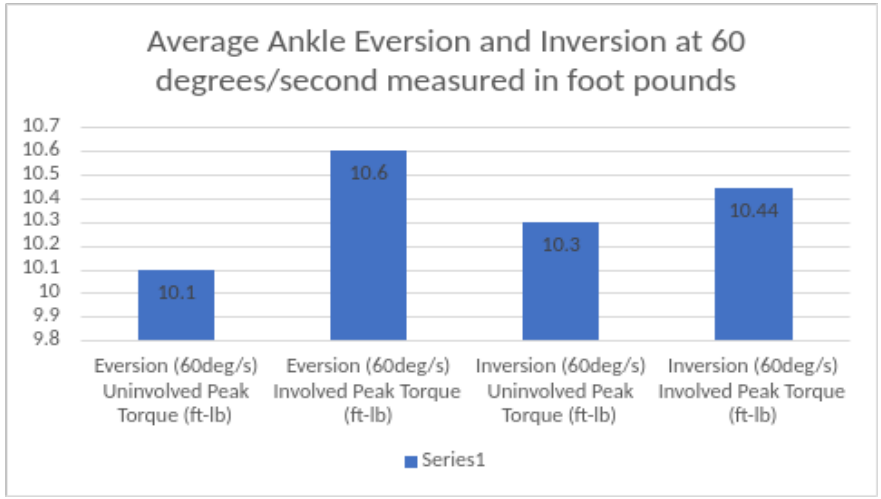
Ankle sprains are the primary cause of injury in intercollegiate athletics. Over the past 20 years there has been no decrease in rates of ankle injury in NCAA athletics. Ankle strength and balance deficits have been attributed to be a risk factor for injury. The ankle is allowed movement in diagonals due to an oblique axis or rotation, that lots of joints can not obtain. Ankle injuries primarily affect the ligaments involved in stabilization. An excessive stretch of tear of one of these ligaments causes instability in the articulations and is classified as an ankle sprain.

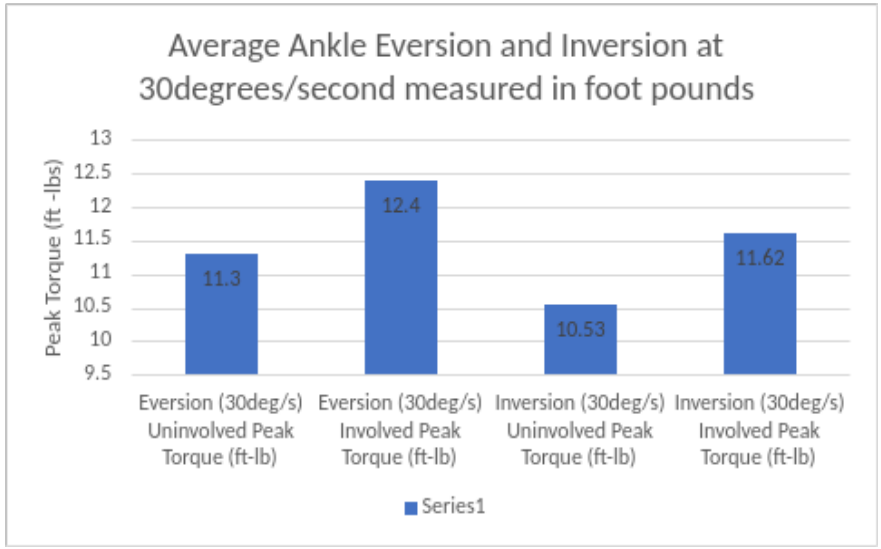
Methods

24 ECSU Women's soccer players were participants in the study. An isokinetic dynamometer was used for ankle strength testing via ankle inversion/eversion testing at speeds of 30 degrees per second (5 reps) and 60 degrees per second (15 reps). The Biodex™ balance system assessed participant balance and ankle fatigue for three rounds of testing on each lower extremity.



Findings of Ankle Peak Torque





Results

Ten out of 24 participants were in the normal range of peak torque deficit (<10% difference) between their left and right ankle, six had deficits in the 10-20% range and eight had deficits > 20%. Average eversion and inversion peak torque at 30 degrees per second was 11.3 ft-lb and 10.5 ft-lb for the left ankle, while the right was 12.4 ft-lb and 11.6 ft-lb. At 60 degrees per second, the left ankle was 10.1 ft-lb and 10.3 ft-lb, while the right was 10.6 ft-lb and 10.4 ft-lb. Average eversion work fatigue for the left and right ankles at 60 degrees per second were around 13%. For inversion, the average work fatigue for the left ankle was 11.9%, and 10.4% for the right.

Conclusion

By identifying factors of ankle fatigue and individual performance with respect to ankle strength, 33% of the women's soccer team had a moderate to severe ankle strength deficiency. Exercise intervention examples were provided to participants based upon their specific deficits.

Significance and Importance: By identifying individuals in the off season, it allows us to identify weak points and areas of improvement, to potentially prevent ankle injuries for a successful collegiate season.