THE EFFECT OF ACCLIMATIZATION TO THE SKATING TREADMILL

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INTRODUCTION: The development of the skating treadmill has enabled researchers to investigate the movement patterns of the forward power skating stride in a controlled environment. It has the potential to aid not only researchers but also coaches, trainers and therapists leading to an end result of improving the overall performance of the athletes themselves. Studies have investigated biomechanical and physiological parameters of forward skating on the skating treadmill. Turcotte et al. (2004) compared plantar forces distribution patterns of on-ice skating to treadmill skating and discovered significantly elevated levels at heel strike. Hinrich (1994) performed a study comparing on/off muscle activation patterns and concluded that the skating treadmill accurately replicates on-ice skating. Both these studies failed to use a familiarization period to allow the subjects to acclimatize themselves to skating on the polyethylene tiles. Nobes et al. (2003) did use three, thirty minute bouts to allow for acclimatization and noted differences in submaximal VO2, HR and stride rate when treadmill skating was compared to on-ice skating. It is unknown if an acclimatization period has an effect on biomechanical or physiological parameters. Thus, the purpose of this study is to determine whether an acclimatization period has effects on O2 consumption, muscle activation patterns and kinematics.

METHODS: Three recreational hockey players wore EMG surface electrodes on the tibialis anterior, lateral gastrocnemius, peroneus longus, biceps femoris, rectus femoris and adductor longus. EMG signals were stored in a portable data logger (Biomation, Mega Electronics Ltd) and sampled at 1000Hz. Cameras filmed from the sagittal and frontal planes enabling for kinematic analysis and determination of stride rate. Cameras were synchronized with EMG signals via the use of a trigger. Markers were placed on the acromion process, iliac crest, lateral epicondyle, lateral maleolus, base of the calcaneus and fifth metatarsal. VO2 values were measured using a metabolic cart (Medisoft) and heart rate values were recorded with the use of Polar heart rate moniters. Subjects reported to the lab five times within a three week period separated by no less than two days of rest between visits. Participants performed four trials at 22km/h for five minutes with five minutes of recovery between bouts.

RESULTS AND DISCUSSION: Based on preliminary pilot studies, it is expected that stride length will increase and stride rate decrease as the acclimatization period progresses. Further, VO2 and EMG amplitudes will decrease will repeated testing.

CONCLUSION: The goal of the present study was to determine the necessity of an acclimatization period when biomechanical and physiological research is performed on the skating treadmill. This research will have implications on future studies by either demonstrating that an acclimatization period is unwarranted or by developing standards for the familiarization period for the skating treadmill.

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