Introduction

Over 15 million Americans run. Running is associated with a high incidence of injury with a reported 50-87% of runners sustaining injury over a one-year period. Techniques or devices that could improve running biomechanics and therefore reduce running injuries are greatly needed. The e3 Fitness grips™ are marketed as a device that improves the stability of the shoulders and hips while running and results in more efficient muscle use by positioning the body in a more “neutral” position. The manufacturer suggests this position ultimately reduces effort and therefore, stress on the joints of the lower extremities by changing the biomechanics of the LE’s. The e3 Fitness grips™ have not been studied for their biomechanical effect on the lower extremities. The purpose of this study was to evaluate the efficacy of the e3 Fitness grips™ as determined by any changes seen using motion analysis to determine any differences in lower extremity body alignment as a result of using the grips.

Methods & Materials

- 21 recreational and competitive runners with a mean age of 23 years old were recruited. Subjects ran regularly at least 6 miles per week prior to participation. None of the subjects had sustained injury within the 6 months prior to the study. 3D Motion Capturing System motion analysis, was used in order to collect and analyze static and dynamic position of reflective markers located on shoulders, the sternum and both anterior inferior iliac spine (AIIS), bilateral patella and bilateral instep. A series of pulsing infrared strobe lights that operated at a sampling frequency of 60Hz illuminated the position of the markers at discrete time intervals, and an array of six cameras were positioned in a U-shaped pattern in front of and along the sides of a Quinton Q55 series 90 treadmill. Each Subject ran on a treadmill with the e3 Fitness grips™ in their hands; with sham grips in their hands or without handgrips. Motion analysis was used to determine change in shoulder level, pelvis level, combination shoulder and pelvis (frontal plane 2007) as well as hip and knee angles. Following three minutes of running, kinematic data was collected for 5 seconds. Analysis of kinematic data was restricted to motions occurring in the frontal and sagittal plane in the current study.

Results

The means and standard deviations were calculated. ANOVA was completed for each level of the independent variable, hip, knee and ankle. A probability level of P<0.05 was selected to determine statistical significance. No significant difference was found in any joint angles measured when compared across the three running conditions.

Discussion and Conclusion: e3 Fitness grips™ are marketed as a revolutionary biomechanical hand positioning system for all athletic activities and specifically for running, walking, and also can be used by those who are recovering from lower limb injuries. These claims are said to be achieved by placing the hand in a device that improves the stability of the shoulders and hips while running and results in more efficient muscle use by positioning the body in a more “neutral” position. The manufacturer suggests this position ultimately reduces effort and therefore, stress on the joints of the lower extremities by changing the biomechanics of the LE’s. The e3 Fitness grips™ have not been studied for their biomechanical effect on the lower extremities. The purpose of this study was to evaluate the efficacy of the e3 Fitness grips™ as determined by any changes seen using motion analysis to determine any differences in lower extremity body alignment as a result of using the grips.

As far as subjective response to the three running conditions; running with no grips, running with e3 Fitness grips™, or running with the sham grips, the response of our subjects was mixed although there was small margin that preferred running with the e3 Fitness grips™ over running without anything in their hands. Subjects definitely did not like the sham grips. Some subjects indicated that they felt there was a definite difference in their running style when using the e3 Fitness grips™ when compared to running without grips. Further studies might investigate the use of other and/or additional forms of scientific analysis (for example force plate measurement) to measure variables of running while using the e3 Fitness grips™. This might lend some additional insight to potential efficacy of the e3 Fitness grips™ which appears to be warranted given the subjective comments by several of the subjects who felt that running with the e3 Fitness grips™ did in fact change their running form.