

ARCHERY TRAINING IMPROVE POSTURAL CONTROL IN YOUNG CHILDREN

Alex, J. Y. Lee¹, Yu-Chi Chiu¹, Ying-Fang Liu², Wei-Hsiu Lin³

Department of P.E., National HsinChu University of Education, Taiwan¹
Division of P.E., HsinSheng College of Medical Care and Management, Taiwan²
Department of P.E., National ChiaYi University, Taiwan³

KEY WORDS: exercise training, balance control, center of pressure.

INTRODUCTION: Exercise training might be beneficial for postural control (PC) during exercise and daily activities. The purpose of the study was to examine the effects of an eight-week archery training program on PC in young children during the standard, aiming, and archery shooting standing posture.

METHOD: Thirty-two young children were recruited and grouped as experimental group (E, 16 children) or control group (C, 16 children). The E group underwent archery training for forty minutes a time, three times a week, for eight weeks, and the C group did not received any regular physical training. PC was evaluated by the measurement of COP displacement on a force platform as the COP radius, speed and sway area during each testing position (Lee & Lin, 2008). The training program was planned by expert archery coaches and based on the training of basic archery skill and coordination. Data were analyzed by the mixed design, two-way ANCOVA to determine if any difference in PC between groups before and after training during the standard posture. Repeated measures, dependent *t* test was also used to determine if any difference in PC before and after training during the aiming and shooting posture in experimental group. The significant level for all statistical tests was set at $p < .05$.

RESULTS: The archery performance was increased from 5.6 points before training to 8.2 points after training per shooting. The COP radius and sway area were significantly decreased after archery training in E group during the standard (0.41 ± 0.04 vs. 0.31 ± 0.03 mm/s, $t = 3.26$; 1.59 ± 0.22 vs. 1.03 ± 0.19 mm², $t = 2.30$) and shooting posture (1.86 ± 0.16 vs. 1.12 ± 0.08 mm/s, $t = 4.41$; 22.26 ± 3.56 vs. 7.19 ± 0.82 mm², $t = 4.27$).

DISCUSSION: During the archery training, subjects were asked to concentrate and focus on the target, therefore, have to control the balance and the movement during shooting practice. It might be the reason for these improvements on PC in COP radius (24-40 %) and sway area (35-68 %) after regular archery training.

CONCLUSION: This study demonstrated that regular eight-week archery training not only improved the performance of archery shooting, but also improved the PC during the standard, aiming, and shooting posture. The results of this study could provide a practical training regimen for archery coaching and understand the possible relationships between the archery performance and PC.

REFERENCES:

Lee AJY. and Lin W.H. (2008). Twelve-week biomechanical ankle platform system training on postural stability and ankle proprioception in subjects with unilateral functional ankle instability. *Clinical Biomechanics*, 23, 8, 1065-1072.

Acknowledgement

This research was supported by grants from National Science Committee (NSC 96-2413-H-134-008 & 97-2410-H-134-022) and National HsinChu University of Education, TAIWAN.