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Matthew P. Brancalone
The Ohio State University, matthew.brancalone@osumc.edu

Maria K. Talarcio
The Ohio State University

Laura C. Boucher
The Ohio State University

James A. Onate
The Ohio State University

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Differences in Static Postural Control Performance Between Athletes who are Hearing and Athletes who are Deaf or Hard-of-Hearing

Matthew P. Brancalone, PT, DPT, SCS, AT, CSCS*; Maria K. Talarico, MS†; Laura C. Boucher, PhD, AT, ATC*†; James A. Onate, PhD AT, ATC, FNATA*†

*The Ohio State University, School of Health and Rehabilitation Sciences, † The Ohio State University Department of Biomedical Engineering, †The Ohio State University Wexner Medical Center, Sports Medicine Research Institute

OBJECTIVE

To determine if differences exist in static postural control performance between athletes who are hearing and athletes who are deaf or hard-of-hearing (D/HoH).

DESIGN AND SETTING

Cross-sectional design. Athletic training facilities.

PARTICIPANTS

Varsity athletes who are D/HoH (n=41, 20.56±1.90 yrs., 1.73±0.08 m., 79.29±18.67 kg.) and university club-level athletes who are hearing (n=103, 20.08±1.62 yrs., 1.76±0.09 m., 78.20±12.26 kg.) volunteered to participate in the study.

INTERVENTION

Participants completed static postural control assessments in double-limb stance with feet together and hands crossed over the chest under the following conditions: 1) eyes open (EO) on firm surface, 2) eyes closed (EC) on firm surface, 3) EO on foam surface, and 4) EC on foam surface.

MAIN OUTCOME MEASURE

Center of pressure (CoP) data were collected on a tri-axial force plate. Total, anterior-posterior (AP), and medial-lateral (ML) CoP excursion, AP and ML CoP range, AP and ML

amplitude root-mean square (RMS), and sway area were calculated. Mixed-model ANOVAs were performed to test the effects of hearing status and condition on postural control. Alpha level was set *a priori* at $p<0.05$.

RESULTS

There was a main effect of condition on total, AP, and ML excursion, ML range, AP and ML RMS, and sway area ($p<0.01$). There was a main effect of hearing status on total ($p=0.03$) and ML ($p=0.01$) CoP excursion, ML range ($p<0.01$), ML RMS ($p<0.01$), and sway area ($p<0.01$). There was an interaction effect on AP range ($p=0.02$).

CONCLUSION

Athletes who are D/HoH were less stable compared to athletes who are hearing. These differences may suggest implications of sensory deficits, specifically vestibular stimuli, between athletes who are hearing and athletes who are D/HoH. Baseline assessments of static postural control performance of athletes who are D/HoH may be necessary rather than using normative data from athletes who are hearing to evaluate performance and guide return-to-play decision making following injury.

KEY WORDS: *Balance, mCTSIB, Disability*