

A Study of the Relationship Between Postural Sway, Navicular Drop, and Ankle Strength in Division I Football Players

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To determine if a relationship exists between postural sway, navicular drop, and ankle strength in Division I football players. Ninety-four University of Kentucky football athletes (age = 20.15 ± 1.40 years; ht = 186.74 ± 6.58 cm; and mass = 104.90 ± 18.53 kg) who were not currently rehabilitating a lower extremity injury, scheduled for or had lower extremity surgery during the time of testing, suffered a concussion in the past month, or experienced any general illness at time of testing volunteered for this study. Each participant was randomly assigned to start with one of the three testing procedures (balance, navicular height, and ankle strength). Subjects were tested prior to preseason competition. The unilateral balance assessment was performed bilaterally and consisted of two conditions: eyes open and eyes closed. Subjects stood bare footed on an Airex balance pad (Alta Vista, CA) placed on the surface of the NeuroCom Smart Balance Master System force plate (Clackamas, OR). The navicular drop was assessed with a Vernier height gauge (Mitutoyo, Japan). Navicular drop was determined by subtracting the value in subtalar joint neutral, from the value in the relaxed position. Ankle muscular strength was assessed in dorsiflexion, eversion, and inversion in each subject with a J-Tech hand-held dynamometer (Salt Lake City, UT). The results were analyzed using Pearson Product Moment Correlations. There was no relationship between Left Eyes Open (LEO) and Left Navicular Drop (LND) ($r = 0.079$), and Right Eyes Open (REO) and Right Navicular Drop (RND) ($r = -0.046$). There was no relationship between Left Eyes Closed (LEC) and LND ($r = 0.155$), and Right Eyes Closed (REC) and RND ($r = 0.024$). The relationship between Left Dorsiflexion (LDF), Left Inversion (LINV), Left Eversion (LEV), and LND was 0.086, -0.027, and 0.018, respectively. The relationship between Right Dorsiflexion (RDF), Right Inversion (RINV), Right Eversion (REV), and RND was 0.085, -0.086, and 0.043, respectively. The relationship between LDF, LINV, LEV, and LEO was 0.062, -0.219, and -0.122, respectively. The relationship between RDF, RINV, REV, and REO was 0.058, -0.073, and -0.072, respectively. The relationship between LDF, LINV, LEV, and LEC was -0.003, -0.143, and -0.017, respectively. The relationship between RDF, RINV, REV, and REC was -0.089, 0.035, and 0.044, respectively. Our results indicate that there is no relationship between balance, navicular drop, and ankle strength. Further research should examine if any of these factors relate to the incidence of ankle injuries.