RELATIONSHIPS AMONG NEUROPSYCHOLOGICAL AND NEUROMUSCULAR FACTORS IN PHYSICALLY ACTIVE HEALTHY MALES

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Context: The Stress-Injury Model provides the theoretical framework between increased anxiety and increased muscle tension; however, little scientific evidence exists to support this link. Yet to be established are the relationships among neuropsychological and neuromuscular factors in the physically active population. Objective: To determine the relationships among neuropsychological factors of anxiety and mood states and neuromuscular factors of dynamic joint stability and alpha motor neuron excitability in physically-active healthy males. Design: Correlational design. Setting: Controlled laboratory setting. Participants: Twenty-one physically active healthy males (age, 23.86 ± 3.11 years; height, 176.24 ± 6.63 cm; mass, 82.71 ± 19.09 kg) with no lower extremity injury within the six months proceeding the study or history of neurological conditions. Measurements: Participants completed the State-Trait Anxiety Inventory (STAI-S and STAI-T sections) and Profile of Mood States (POMS) in randomized order. Vertical leg stiffness was assessed by three drop jumps onto a Kistler Force Plate. The drop jump consisted of standing on a 45-cm wooden box, leading off with the dominant leg, dropping onto the force plate with a double-leg landing and then completing a double-leg jump as high as possible to displace the veins on a Vertec Jump Trainer. Five minutes following vertical leg stiffness testing, the participant was prepared for and completed the Hoffman reflex testing. A standardized testing position was used to collect Hoffman reflex H/M ratio data. The ipsilateral knee was positioned at 15° flexion through use of a 6-cm foam block. Throughout testing, participants listened to white noise through bilateral headphones and positioned their arms comfortably above their heads. Pearson-Product Moment Correlations were used to determine the relationships among the STAI-S, STAI-T, POMS, vertical leg stiffness, and Hoffman reflex H/M ratio. Results: A significant negative correlation existed between the STAI-S and Hoffman reflex H/M ratio (r = -0.459, p = 0.036). No other relationships were significant (p > 0.05). Conclusions: The neuropsychological factor of state anxiety is negatively correlated with the Hoffman reflex H/M ratio. As the STAI-S increased, there was a decrease in the H/M ratio. The extent to which this is related to function and injury risk is yet to be determined. Key Words: anxiety, mood state, dynamic restraint system, acute non-contact injury, H-reflex