

Does Handedness Impact Pulmonary Measures during Pickleball?

SAMANTHA E. CRUZ, TASHARI A. CARBALLO, DUSTIN W. DAVIS, BRYSON CARRIER, JAE K. BOVELL, MATAHN A. BLANK, THEA S. SWEDER, ZHIHAO YU, SETAREH ZAREI, & JAMES W. NAVALTA, FACSM

Department of Kinesiology and Nutrition Sciences; University of Nevada, Las Vegas; Las Vegas, NV

Category: Undergraduate

Advisor / Mentor: Navalta, James (james.navalta@unlv.edu)

ABSTRACT

Pickleball is a racquet sport that originated in the 1960s. Due to its beginner-friendly nature, it attracts players of all ages and fitness levels. Despite becoming the most quickly growing sport in the nation, it is still underresearched. The sport's physiological demands based on pulmonary measures, and whether the demands differ by handedness, are not fully understood. **PURPOSE:** The purpose of this study was to analyze and assess whether differences were evident in performance and physiological responses in players when using the dominant (DH) and nondominant hand (NDH) during pickleball. **METHODS:** Participants were selected through convenience sampling and consisted of 11 (2 female, 8 male, 1 prefer not to disclose; age = 28.1 ± 9.2 years; height = 176 ± 8.0 cm; mass = 73 ± 13.4 kg). Participants were all equipped with a COSMED K5 wearable metabolic system attached through a harness securely worn on their back. Outcome measures included Ventilation (VE [L/min]), Ventilatory Equivalent for Oxygen (VE/VO₂), Ventilatory Equivalent for Carbon Dioxide (VE/VCO₂), Tidal Volume (VT), and Respiratory Frequency (Rf). Alternating intervals of five minutes of play followed by five minutes of rest were consistent throughout. The order of using the DH or NDH was counterbalanced. Data were analyzed using a paired *t*-test with significance accepted at $p \leq 0.05$. **RESULTS:** Significant differences were observed for VT (DH = 1.4 ± 0.3 vs. NDH = 1.3 ± 0.2 , $p = 0.05$) and VE/VCO₂ (DH = 30.9 ± 2.5 vs. NDH = 32 ± 2.9 , $p = 0.04$). However, there were no significant differences found for VE in L/min (DH = 57.5 ± 9.7 ; NDH = 52.5 ± 11.6 , $p = 0.08$), VE/VO₂ (DH = 25.9 ± 2.1 vs. NDH = 26 ± 2.9 , $p = 0.43$), or Rf (DH = 40.9 ± 4.1 vs. NDH = 41.3 ± 5.4 , $p = 0.36$). **CONCLUSION:** The greater mean VE/VCO₂ during NDH play compared to DH play suggests that the use of the NDH presents more difficulty performing pickleball-related tasks. Switching to the NDH is reflected in expiring more CO₂, indicating that players exert more effort when using their NDH. Although the respiration measures were similar in terms of exhalation, the use of DH caused a greater mean VT than NDH.