ABSTRACT

INTRODUCTION: Leg dominance can be defined in a multitude of ways, but in general is considered the preferred leg for activity. Skeletal muscle fiber composition is an important determinant of whole muscle performance. PURPOSE: The purpose of this project was to determine if a relationship exists between leg dominance and muscle fiber type profile of the vastus lateralis. METHODS: Five participants (age= 23.4 ± 3.64y, h= 1.80 ± 0.09m, mass= 82.92 ± 12.91kg) answered a questionnaire consisting of six questions relating to leg dominance. Additionally, each participant underwent a bilateral vastus lateralis muscle biopsy. Fiber type profile was determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis. Individual muscle fibers were identified as either myosin heavy chain (MHC) I, MHC I/IIa, MHC Ila/IIX, MHC IIa, MHC IIa/IIX, or MHC I/IIa/IIX. The percentage of each fiber type was taken as the participant’s muscle fiber type profile. RESULTS: Paired sample T-tests revealed a significantly higher percentage of MHC I fibers in the right leg compared to the left leg (right=33.43 ± 9.72% vs. left=26.36 ± 16.19%). Additionally, split file paired sample T-tests revealed a significantly higher percentage of MHC I fibers in the dominant leg when dominance was identified as “Which leg do you prefer to kick a ball with?” All participants identified as right leg dominant while kicking. No other significant differences were found between the other fiber types and dominance questions. CONCLUSION: The right leg showed a higher proportion of MHC I fibers compared to that of the left leg. Also, a higher percentage of MHC I fibers were found in the dominant kicking leg. However, it is difficult to conclude a relationship between MHC I fiber percentage and dominant kicking leg as all participants answered the question uniformly (right leg). These data suggest leg dominance can only partially be explained by muscle fiber type composition.

INTRODUCTION

Muscle fiber composition has shown to be a significant indicator of whole muscle performance among many measures including strength, power, and endurance. Leg dominance is a measure of whole muscle performance in which the influence of muscle fiber composition has not been extensively studied. Therefore, the purpose of this study is to investigate a relationship between muscle fiber profile of the vastus lateralis and leg dominance.

METHODS

RESULTS

Leg dominance can be partially explained by muscle fiber type profile. These Data suggest MHC I fiber percentage may be a determining factor of leg dominance. However, other physiological variables may have greater contribution in influencing leg dominance.

CONCLUSION