IDENTIFYING LIMB DOMINANCE IN ADOLESCENT FEMALE BASKETBALL PLAYERS: IMPLICATIONS FOR BIOMECHANICAL RESEARCH

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INTRODUCTION

- Limb dominance is often defined based on an athlete’s preferred kicking leg, yet this definition may not apply to all sports (Fort-Vanmeerhaeghe, 2015).
- Limb dominance may be sport- or task-specific.
- In basketball, the definition of limb dominance is inconsistent, whereas some studies utilize self-reported measures and others use results from more basketball-specific performance tests (McGrath, 2015).
- Other measures have been utilized in looking at limb asymmetries; however, these more basketball-specific tasks have not been investigated in defining limb dominance.

PURPOSE

- To identify relationships between different methods of determining limb dominance in adolescent female basketball players.

METHODS

Participants:
- Forty adolescent female basketball players
  - age: 15.5 ± 1.2 years, height: 168.0 ± 7.3 cm, mass: 63.3 ± 11.0 kg.

Procedures:
- Participants were instrumented with 43 retroreflective markers for 3-D motional analysis with a 24-camera motion analysis system (Eagle cameras, Motion Analysis Corporation) at 200 Hz (Figure 1).

Self Report Measures
- Each participant was asked to self-identify their preferred kicking and jumping limb.

Single Leg Triple Hop for Distance
- The participant was instructed to stand with their great toe of the designated jumping leg on the indicated starting line (counterbalanced for each subject).
- Each participant performed three consecutive maximal forward hops with the same leg (Figure 2).
- Three trials were performed on each leg in alternate order.
- Maximal distance was measured from starting line to point where great toe landed after third hop.
- Limb dominance was determined by the single furthest hop distance achieved by the participant.

Single-Leg Countermovement Jump (SLCJ)
- Participants performed a SLCJ while reaching up with both hands to a target suspended overhead (Figure 3).
- Three trials were performed on each leg in a counterbalanced order.
- Maximal jump height was determined by the difference between peak center of mass height during jumping and center of mass height during quiet standing.
- No technique instructions were provided (i.e. arm swing was allowed).
- Limb dominance was defined by the single highest jump performed by the participant.

Statistical Analysis:
- Chi square tests for independence were performed to compare self-report and performance measures of limb dominance (α<.05).

RESULTS

- There was a significant relationship identified between self-reported preferred kicking (R=36, L=4) and jumping legs (R=25, L=15) (p=0.006) (Figure 4).
- No significant relationships were found when comparing self-reported jumping leg to performance measures during the TH (R=21 L=19, p=0.57) or SLCJ (R=23 L=17, p=0.80).
- Additionally, performance measures did not consistently produce the same definition of limb dominance amongst individuals (p=0.22) (Figure 4).

SUMMARY AND CONCLUSIONS

- Self-selection of the dominant limb appears unrelated to performance.
- Furthermore, limb dominance, as defined by vertical jump height, is unrelated to limb dominance defined by horizontal jump distance.
- The results of this study may call into question the validity of defining limb dominance by self-report or performance measures in adolescent female basketball players during biomechanical studies.

REFERENCES