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Analysis of the bilateral lower extremities of female basketball players: A pilot study

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INTRODUCTION:

Female basketball players have the highest probability of lower limb injury, and the risk of injury is more significant than male basketball players [1]. Since basketball is a sport with unilateral dominance, it may cause asymmetry in strength and balance on landing between the dominant side and the non-dominant side of the lower limb. Therefore, the purpose of this study was to discuss the bilateral differences in lower limb strength and dynamic posture stability of female basketball players during single-leg drop jump landing by reactive strength index (RSI) and time to stabilization (TTS).

METHODS:

There were 7 Division I female basketball athletes recruited in this study. Subjects had no severe head and lower extremity injuries or surgery within half a year. Within three months before the start of the experiment, subjects are without acute lower extremity injuries. During the experiment, kinetics data were collected by a Kistler force plate at 1000Hz and were used for data analysis during the single leg drop jump, including Jump height, RSI, Impact force, and TTS.

RESULTS:

The results of this study show that the dominant side RSI is significantly greater than the non-dominant side ($p<.05$) during the single leg drop jump, but there were no significant differences in jumping height and landing impact force. The dominant side of ML-TTS was significantly shorter than the non-dominant side ($p<.05$), but there was no significant difference between AP-TTS and V-TTS.

CONCLUSION:

Jumping injuries are common in basketball, especially when landing on a single leg. However, there was no significant difference in jumping height between the dominant and non-dominant sides. The difference in RSI showed that the dominant side could reach the same jump height with a shorter movement time, which may be related to specific movements of basketball patterns, such as unilateral jumping.

The symmetry of the lower limbs helps reduce the risk of injury [2]. Landing in the ML direction is a complex movement for humans, and poor dynamic postural stability is a known risk factor for ACL injury in athletes. Therefore, the difference in the RSI and TTS-ML between the dominant and non-dominant sides of the womens basketball players in Division I may be one of the potential injury risks. There are currently only seven subjects in this study, and the experiment will continue in the future. After enough subjects, the results will be more convincing.

REFERENCES:

- 1) Agel, J et al., J Athl Train, 2007
- 2) Niksic, S. R et al., Int J Res Ex Phys, 2019

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