

BIOMECHANICAL INVESTIGATION OF A QUICK SCISSORS MOVEMENT ON SOCCER DRIBBLING

Kawamoto, R. 1), Miyagi, O. 1) & Ohashi J.1)

1) Faculty of Sports and Health Science, Daito Bunka Univ., Japan

Keywords: biomechanics, double-scissors movement, center of gravity of whole body

Introduction

To understand the underlying mechanisms of representative soccer techniques, numerous biomechanical researches have been accomplished. However, there are few researches about dribbling to beat an opponent. To beat an opponent on dribbling, 'double scissors' is one of the most common movements. The purpose of this study was to clarify the essentials of quickness of double-scissors movement on soccer dribbling.

Methods

Twenty-one male collegiate soccer players and nine inexperienced students participated in the experiment. The subjects were instructed 1) to dribble a ball freely in the 2.0m distance, 2) to perform double-scissors movement in front of the mark as quickly as possible, and 3) to deliver the ball explosively toward the direction set at an angle of 15 degrees against the straightforward. The motion was captured at 250Hz by eight optoelectronic cameras of the motion capture system. Ground reaction force during the stance accompanying the explosive ball delivery was also recorded.

Results & Discussion

Mean net time for the double-scissors movement was shorter for the experienced group than for the inexperienced group ($0.910 \pm 0.135s$ vs. $1.105 \pm 0.103s$, $p < 0.001$). High positive correlation was found between the maximum amplitude of the CG and net time for the double-scissors movement, especially in the transversal direction (Fig.1). Mean ground reaction force per the stance time (N/s) in the transversal direction was significantly greater for the experienced group than for the inexperienced group. Some kinematic parameters such as the transversal speed of the foot, the maximum height of the foot, and the step width were also significantly different between the groups.

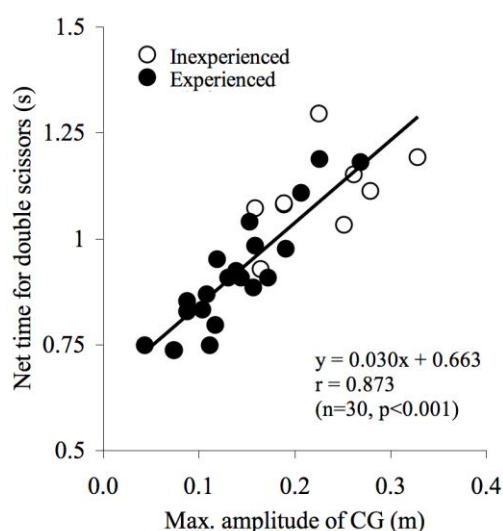


Figure 1. Relationship between maximum amplitude of CG and net time for double scissors.

Conclusion

To accomplish a quick double scissors on soccer dribbling, appropriate control of the CG in the transversal direction is essential.