

IMPROVEMENT OF KICKING ACCURACY BY SOCCER SHOE DESIGN

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Introduction

The primary benefit of soccer shoes for improving player performance is to provide enough traction for powerful movements on the field. In general soccer players do not believe that their footwear can improve kicking precision or maximum kicking velocity. Because kicking accuracy is very important for passes and kicks on goal, our laboratory performed various studies to explore possible mechanisms, that could influence kicking precision by certain shoe features.

Methods

In a first study 5 commercially available soccer shoes and barefoot kicking were tested with 24 subjects (figure 1). The task was to achieve best kicking accuracy towards an electronic target at a distance of 10 m and a target center height of 115 cm. In a second study different friction properties of 7 shoe upper materials were tested with 18 subjects. In the third study the pressure distribution between the shoe upper and the ball was measured with 20 subjects in 2 shoe models, using a capacitive pressure distribution sensor matrix (Novel Inc.). To achieve a more homogenous pressure distribution between the shoe and the ball, foam materials were attached to various locations of the foot of 18 subjects in a fourth study. Kicking accuracy was measured in the same shoe with and without foam attached to specific regions of the foot.

Results & Discussion

In our first study it was found that barefoot kicking had the least accuracy as compared to all shoe conditions (figure 1). Wearing shoe C the players kicked with a better precision as compared to all other footwear conditions. From our pressure distribution studies we concluded that a more homogenous pressure distribution results in better precision. Friction of the ball with the shoe upper had no influence.

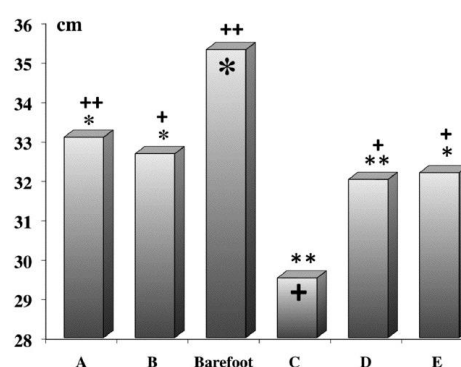


Figure 1. Distance from target center in six footwear conditions (**,++ p< .01, *,+ p< .05).

Conclusion

Soccer shoe design influences kicking accuracy. The homogeneity of pressure between shoe and ball was identified as the key factor for a better precision.

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