KINEMATIC ANALYSIS OF THE SOCCER'S THROW IN TECHNIQUE

Mala, L. 1), Zahalka, F. 1), Maly, T. 1) & Buzek, M. 1)

1) Sport Research Centre, Faculty of Physical Education and Sports, Charles University, Prague, Czech Republic

Keywords: football, throw in, kinematic analysis

Introduction

The goal of this study is to contribute to explanation of differences in the selected parameters initializing movement of the lower and upper extremities during the running throw in and to compare the chosen spatiotemporal characteristics of the throw in after the run up and from the standing position [1]. The typical manifestation for the throw in is a gradually increasing linear speed of segments from proximal to distal parts of the upper limbs [2].

Methods

The research group consisted of 13 top level soccer players (age = 20.28±0.91 years, height=179.45±4.62 cm, weight=76.15±3.72 kg). Each subject had 3 attempts of throw ins from standing position and with the run up. The task of the subjects was to achieve a throw of maximum length in accordance with the valid rules concerning throw ins. Movement of the body was recorded by there MiniDV digital cameras, data was transformed to 3D and analyzed by software TEMA Bio 2.3. To evaluate the speed of the thrown ball the radar STALKER ATS was used.

Results & Discussion

There were detected two types of throw performance. In the first type both extremities perform the symmetrical movement from behind and over the head, in the second one there is rotation of the whole trunk and the swing is performed mainly by the dominant upper extremity. In standing position throws, a mean value of the longest measured trials was 20.19±1.52 m. In run up throw ins, the distance of the throws was longer by 13.5% when compared to the throw ins from the standing position (23.34±2.75 m, $p<0.01$). In case of maximal velocity of the ball after the throw in, the lower mean velocity was registered in throw-in from the standing position (13,92 $m.s^{-1}$) than in the run up throw in (14,97 $m.s^{-1}$; $p<0.01$). When throwing in after the run up the maximum velocity was 17.21$m.s^{-1}$ and the minimum velocity was 13.03$m.s^{-1}$.

Conclusion

The longer throw ins with higher velocity was achieved in run up throw-ins. Throw-in issues are very important in current top level soccer dynamics, which exerts high demands on velocity interacted with game situations. The issue of the choice of a throw-in type in terms of achieving required results (spatiotemporal characteristics) should not been avoided in training praxis, perhaps even in athletes' diagnostics.

References

1. Lees, A. & Nolan, L (1998). *Rev Jour Sports Sci*, 16, 211–234.
2. Linthorne et al. (2004). *Sport Biomech*, 5, 243-260.