

THE CONSIDERING FOOT POSTURE INDEX IN RUSSIAN SOCCER PLAYERS 10-12 YEARS OLD

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ABSTRACT

Understanding the structural status of the foot is effective in the process of training, implementation skills and preventing injuries in soccer player adolescents. The aim of the study was to understand the foot posture characteristics of Russian soccer players 10-12 years old. The overall FPI, obtained as the sum of the scores of its six individual criteria, was determined in 18 soccer players 10-12 years old in static bipedal stance and relaxed position. The Mean \pm SD Foot Posture Index scores ranged from -0.07 ± 1.27 to 1.67 ± 0.48 in the left foot and 0.00 ± 1 to 1.67 ± 0.48 in the right foot. There was an appropriate structure of the both foot in soccer players adolescents. Also, there was an inappropriate structure of Calcaneus of left leg.

Keyword: *Foot posture index, Foot morphology, Soccer players, Adolescent.*

1. INTRODUCTION

The technical gestures characteristic of certain sports may lead to one type of foot being more prevalent than the others. Foot posture has long been considered to contribute to the development of lower limb musculoskeletal conditions as it may alter the mechanical alignment and dynamic function of the lower limb (Levinger, Menz, Fotoohabadi, Feller, Bartlett, & Bergman, 2010). Ruas, Minozzo, Pinto, Brown and Pinto, (2015) have reported that deviating foot posture has been shown to cause inefficient motion when performing athletic skills such as running or jumping. Otherwise, resulting in decreased physical activity and work time lost in addition to substantial medical costs (Murphy, Connolly, & Beynnon, 2003).

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A key consideration when interpreting these findings is the reliability of the foot posture measures. Previous studies have indicated that frontal plane calcaneal measures have questionable reliability (Wrobel & Armstrong, 2008), while FPI reliability is moderate to good, depending on the clinical experience of the assessor (Barton, Bonanno, Levinger, & Menz, 2010).

Identifying unique structural, mechanical and other contributing factors related to this fracture would be important for planning targeted preventive measures, as well as management strategies and footwear design following an injury. Nevertheless, scientific evidence to support such contributing factors is inconclusive, although possible anatomical risk related elements have been described (Hetsroni, Nyska, Ben-Sira, Mann, Segal, Maoz, & Ayalon, 2010).

Using an objective measure that does not require any subjective interpretation may be important to include as part of foot posture assessment. The Foot Posture Index (FPI) has been used as a diagnostic tool for support postures in various sports, but the differences in these postures between sports of distinct gestures in their actions are far from completely understood.

There is a lack of study which considering about foot posture index in soccer players adolescents. As interposition specialization starts at the early age, the understanding of foot posture of soccer players adolescent is of high importance for coaches as well as for sports teachers. The aim of this study is to realize the foot posture of Russian soccer players 10-12 years old.

2. METHODS AND MATERIALS

In this descriptive study using the FPI-6, 18 children football players were measured and their feet were classified according to foot posture index (FPI) as neutral, supinated and pronated.

The 6 items of the FPI include taller head palpation, curves above and below the lateral malleoli, calcaneal angle, talonavicular bulge, medial longitudinal arch and forefoot to rear foot alignment. Each item was scored on a 5-point scale between -2 and +2 and provides a total sum of all items between -12 (highly supinated) and +12 (highly pronated). The raw FPI scores were converted to Rash transformed scores to allow the scores to be used as interval data (Keenan, Redmond, Horton, Conaghan, & Tennant, 2007).

In the most cases there will be a consistent pattern of scores and the clinical picture will be immediately clear. However in some cases there will be a dominance of motion occurring in one of the three body planes or difference between the function of the forefoot and rear foot.

The foot segment and the body plane measured by each of the observation are indicated on the FPI data sheet. This allows the FPI to provide substantially

more information than existing single segment/single plane assessment techniques. The obtained results were processed by means of standard statistical procedures for determining the basic descriptive statistical parameters – mean (X) and standard deviation (SD). The basic descriptive parameters of foot posture characteristics of the whole group are presented in table 2 (Foot Posture Index).

3. RESULTS

Table 1: Descriptive data from foot posture index in both leg of soccer players 10-12 years old M±SD (N=18)

| FPI | M±SD | |
|-------------|------------|-----------|
| | Left leg | Right leg |
| Tallos head | 1.67±0.48 | 1.53±0.63 |
| Maleol | 0.87±0.83 | 0.73±1.03 |
| Calcaneus | -0.07±1.27 | 0.00±1 |
| Talunavi | 0.47±1.06 | 0.53±1.12 |
| Forefoot | 0.93±0.70 | 0.80±0.67 |
| Toe | 1.67±0.48 | 1.53±0.51 |

The average of scores have shown that, there is an inertia in the left calcaneus bone (-0.47±1.27). Calcaneus position in right leg is in normal situation. The Tallos left leg (1.67±0.48), right leg (1.53±0.63), Maleol left leg (0.87±0.83), right leg (0.73±1.03) and Talunavi left leg (0.47±1.06), right leg (0.53±1.12) in right and left leg has a normal situation.

4. DISCUSSION

The objective of this paper was determination of the foot posture characteristics and determination of foot structure in soccer players 10-12 years old. The obtained data clearly indicated that there was no inappropriate position of foot in both leg. Just, calcaneus position (-0.07±1.27) was in inappropriate situation. This variable can influence on teaching and performing technique in soccer players. Knowing this result can help to teacher for improving or resolving all limitation in early ages. Reform feet should be done in children be-cause in upper age is more than impossible to reform feet structure. Also, Understanding the structural status of the foot is effective in the process of training and preventing injuries in adolescents.

Evans, Rome and Peet, (2012) have reported, relevant measures of foot posture are important for such assessments to be accurate over time. Researchers have measured the magnitude of the impact force. They studied 150 kicking actions performed by 15 elite soccer players by using mobile sensors and high-

speed video. In 39% of the kicking actions, the plantar flexion angle exceeded the maximum static plantar flexion angle. They have found that, spur formation in anterior ankle impingement syndrome is related to recurrent ball impact, which can be regarded as repetitive micro trauma to the anteromedial aspect of the ankle (Tol, Slim, Van Soest, & van Dijk, 2002). In the sample of healthy, asymptomatic children age 7 to 15 years, children with a more pronated foot type exhibited greater lower limb and whole-body flexibility, but not greater ankle joint flexibility. There was strong agreement between lower-limb and whole-body flexibility. This study highlights the importance of assessing the paediatric flat foot in the context of a developing body (Hawke, Rome, & Evans, 2016). Otherwise, In an extensive study on the reliability of foot position in children (4-6 years), adolescents (8 - 15 years) and adults (20 - 50 years), it was reported that the reliability of measures of foot position in children were reduced when compared to adults, with raters commenting that children remained less still between repeated measures (Evans, Copper, Scharfbillig, Scutter, & Williams, 2003). The reduced reliability of measures of foot position in children was also known in a later study looking at the intra-rater reliability of measuring anthropometric characteristics of children's feet (Morrison, Durward, Watt, & Donaldson, 2005). The method of measurement is important to recognize the amount of inappropriate position of foot in adolescents. Finally, we could mention that, knowing the structure of foot posture in adolescents can be useful for planning and teaching different type of technique in soccer players. It has been recognized that all aspect of body should be in right situation to learn more accurately.

5. CONCLUSION

The result of this study showed that, foot posture of soccer players 10-12 years old are in normal situation. This can be useful for coaches and parents to prepare appropriate program to learn more effectively and faster and also safety condition for preventing injury in future.

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