

Intrinsic Risk Factor of Ankle Sprains in Adolescent Soccer Players

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Summary:

Dorsiflexion range of motion (less than 20°) at the ankle is strongly associated with risk of ankle sprains in male adolescent soccer players, therefore, interventions for increasing ankle joint could be useful for male adolescent soccer players to prevent ankle sprains.

Abstract:

BACKGROUND

Many variables have been retrospectively associated with ankle sprains. However, little is known about factors predisposing adolescent soccer players to these injuries.

PURPOSE

To identify measurable intrinsic risk factors might predispose to ankle sprains and develop of injury-prevention programs in male adolescent soccer players.

STUDY DESIGN

Cohort study; level of evidence, 2.

METHODS

A total of 170 male adolescent soccer players (age range, 12-18 years) were evaluated for possible intrinsic risk factors for ankle sprains. The evaluated intrinsic risk factors included anthropometrical characteristics (height, mass, BMI), age, general joint laxity, range of motion at the ankle and hip, and history of an ankle sprain. Subjects were followed prospectively for 12 to 19 months.

RESULTS

A total of 18 (10.6%) of the 170 male subjects sustained an ankle sprain; 2 sprained both ankles. The incidence rate of ankle sprains was 0.19 injuries per 1000 hours of play.

Recurrence rate of ankle sprains was 25%. Logistic regression analysis revealed that adolescent soccer players with decreased dorsiflexion range of motion less than 20° (odds ratio [OR] = 11.2, 95% confidence interval [CI], 2.72-46.1, $P < .001$), and older players (OR = 3.02, 95% CI, 1.07-8.50, $P = .037$) had a significantly higher risk of ankle sprains. Furthermore, these trends were more apparent in the dominant ankle than in the non-dominant ankle. History of a previous sprain was not a risk for ankle sprains.

DISCUSSION

Several studies propose potential factors of ankle sprains susceptibility. Anatomic characteristics (eg, increased foot

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width), functional deficits in isokinetic strength, flexibility, joint position sense, balance-postural sway and gait mechanics, limb dominance, previous ankle sprains, and increased weight and BMI are the primary risk factors of this injury. In this study, the ratio of players with a history of ankle sprains increased sharply above the age of about 15 years, and we showed that decreased dorsiflexion range of motion less than 20° was risk factors of ankle sprains. Limitation of dorsiflexion may be caused by a tight gastrocnemius, tight soleus, tight capsular tissue and abnormal osseous formation of the ankle. Among them, a tight gastrocnemius is relatively common factor of limitation of dorsiflexion. In adolescents, greater mobility and flexibility may be present than in adults, so we propose that interventions for increasing ankle joint is necessary to keep dorsiflexion range of motion more than 20° below the age of about 15 for the prevention of ankle sprains.

CONCLUSION

Based on our findings, it is suggested that dorsiflexion range of motion (less than 20°) at the ankle and older players are strongly associated with risk of ankle sprains in male adolescent soccer players. Interventions for increasing ankle joint could be useful for male adolescent soccer players to prevent ankle sprains.