



ASSESSING INCIDENCE OF ANKLE INJURIES AND ASSOCIATION OF FOOT POSTURE INDEX WITH ANKLE PROPRIOCEPTION IN FOOTBALL PLAYERS

Shubhankar Rawte Physiotherapy Intern at Lokmanya Tilak College of Physiotherapy.

Dr. Tejashree Dabholkar* MPT, PhD Associate Professor and HOD at Lokmanya Tilak College of Physiotherapy. *Corresponding Author

Dr. Shweta Phadke MPT, PhD Professor and Principal at Lokmanya Tilak College of Physiotherapy.

ABSTRACT **Background:** Football is a dynamic game where lower extremity is used to manipulate football for scoring a goal. Repeated frequency of Ankle injury is common in this game which can lead to abnormal Ankle proprioception. Affection of Ankle proprioception may lead to altered Foot posture. Hence this study was done to find the incidence of Ankle injuries and association of Foot Posture and Ankle proprioception in football players. **Method:** A self-made questionnaire used to analyse, 100 football players from various parts of South Mumbai between the age group of 12-18 years. The incidence of Ankle injury was noted. Players with injury within 6 months were taken for further assessment. Foot Posture Index (FPI) and Ankle proprioception association analysis done using correlation statistics. **Result:** The incidence of Ankle injury in football players was found to be 30%. The correlation coefficient for associating Ankle proprioception and FPI was 0.17 on correlation analysis. ($p=0.52$), which was statistically not significant. **Conclusion:** There was no association between FPI and Ankle Proprioception.

KEYWORDS : Foot Posture Index, Ankle Proprioception, Football

INTRODUCTION

Football is a dynamic and aggressive sport played amongst 11 players in one team and 11 players in another team. There consists of mainly four positions namely; Goalkeeper, Defender, Midfielder and a Forward. A Goalkeeper is the only person to use his hands while all others have to play only with their torso, head and lower limb. Since the 1990s, the Goalkeeper's position has evolved dynamically. Although shot stopping will always be an essential skill, newer demands are imposed on modern Goalkeepers¹. The job of a defender is to stop the opponent team to score while that of a Forward is to score a goal for the team. Hence forward players and central defenders are more prone of getting injured and sustain a high number of injuries².

Football is a sport characterized by continuous and high intensity activity with abrupt change of direction and foot landing. Therefore, Lateral Ankle sprain caused by inversion trauma is the most prevalent acute injury. A decreased proprioception was seen as a risk factor for injuries³ and seen as an indication of non-contact Ankle sprain in teenage football athletes⁴.

Teenage football players are exposed to high energy in playing football with low knowledge of various injuries, thus leading to having a higher risk of Ankle injuries. Besides the factors predisposing to injuries, teenage football players ignore early stretching and necessary warm up⁵. Ankle sprains are the most common pathology accounting for up to 67% of all soccer related Ankle injuries⁶. Since Ankle injuries are common in football players, it is seen in youth football players at a majority level. The lower limb is most commonly affected with the Ankle accounting for up to a third of all injuries. The consequences of Ankle injuries include reduced physical activity and endurance levels, lost game time⁶. Ankle sprain is the most common lower limb injury seen in different athletes at a different sporting level⁷.

In lower limb injuries, Ankle and knee injuries were seen most commonly amongst Indian Football Players. In these almost 27% of injuries were contributed to be recurring injuries⁸.

Traumatic injuries are the one documented with the highest prevalence of 81.5% and overuse injuries were documented to be 18.5%. Injuries to the knee were documented to be 29% and 19% were Ankle injuries⁹. Various factors are accountable for injuries including the age of the player, previous other injuries player has gone through, surface on which the player is playing, inadequate or poor rehabilitation for the past injuries, ignoring safety equipment's like taping, shin pads, under training or over training, etc⁹.

Proprioception has been defined as one's ability to integrate the sensory signals from various mechanoreceptors to thereby determine body position and movements in space¹⁰.

Loss of Proprioception most commonly seen in Ankle is usually after an Ankle sprain⁷. It is a major drawback for football players since the Ankle joint is the most involved joint while playing football. Loss of Balance is the most important feature seen in altered proprioception⁷. There is a mild relationship between ligament laxity and foot pronation, and females are more prone to have pronated feet than males¹¹. Recurrent Ankle sprain leads to affected proprioception in athletes¹¹.

The aim of the study is to find the prevalence of Ankle injuries and establish a correlation between Foot Posture Index (FPI) and Ankle Proprioception amongst Football players.

METHODOLOGY

Ethical clearance was obtained from the Institutional Ethics. The purpose of the study was discussed with all participants and informed consent was taken.

STUDY DESIGN: Co-relational study design

SAMPLING METHOD: Convenience Sampling

SAMPLE SIZE: 100 football Players.

STUDY SETUP: Various clubs of South Mumbai Area

Football players between the age group of 12-18 years playing on grass and artificial turf who had injury before 6 months at the Ankle and playing for minimum 2 years of Experience were considered for study. Football players with fractures, open wounds, bruises or other injuries or neurological disorders of the Lower extremity and Non- consent to participation were not considered for study.

Consent was taken from all football players and the purpose of the research was explained. A self-made questionnaire was made which included the following points of consideration; Type of injury, Ankle involved, position of the football player, return to sport duration, onset of the injury, return to sport, exercise protocol etc.

Football players who had an Ankle injury within the last 6 months were considered for further study. Foot posture index scale which is an observational based scale was used to assess foot posture in players. For the FPI scale, player was made to stand still with arms on the side and eyes looking straight. Evaluation done with observation of weight bearing position of hind foot. Grading done to categorise player in to supinated, pronated and normal foot⁵.

Proprioception was assessed using universal goniometer for injured Ankle. Difference of 5 degrees was considered to be labelled as positive proprioception involvement in players¹³. correlation analysis done using Pearson correlation test on Graph Pad prism version 9.5.1.

RESULTS AND OBSERVATION:

Table 1: Demographic Data

Demographic Data	Average
Age \pm SD	14.31 \pm 1.93
Level of Playing	Percentage
U-13	22%
U-15	32%
U-18	17%
U-19	10%
School	19%

Table 2: Incidence of Ankle Injuries

Incidence of Ankle injury	Players with Ankle injury- 30% Players without Ankle injury- 70%
Injury in last 6 months	Within last 6 months- 57% Post 6 months- 43%

Table No 3: FPI vs. Ankle Proprioception Correlation

r	0.17
95% confident level	-0.3392 to 0.6009
R squared	0.02857
P (two-tailed)	0.52#

- NOT SIGNIFICANT

DISCUSSION

This study is done to find the prevalence of Ankle injuries in football players and the association of Foot Posture index with Ankle proprioception. Out of 100 football players, 70 (70%) did not have an Ankle injury ever while the other 30 (30%) had undergone an Ankle injury. Study done by Kumar SS, 2008 et al has given a prevalence of Ankle injury in football players of almost 33% and it was due to overuse Ankle injuries¹².

Out of the 30 football players who had undergone an injury, 17 (36%) had undergone an Ankle injury within the last 6 months while the other 30 (64%) had undergone an injury post 6 months. (Table 2) Football players who had undergone an injury with their Ankle being twisted leading to lateral Ankle sprain were 26 (87%) and medial Ankle sprain were 4 (13%). In our study, 96 (96%) football players play on an uneven surface while the other 4 (4%) play on artificial turf. Thus uneven surface could be contributing as one of the factor for Ankle injury in our study population.

87% football players always warm-up, 8% of the players warm-up occasionally, 2% players warm-up many a times while 3% players never warm-up. Poor post injury rehabilitation along with early return to sport contributes to the factor of having an Ankle injury. Out of the 30 injured players, 19 of them started playing within 4 weeks' time, 8 of them resumed playing within 4-6 weeks' time, 1 started playing within 6-8 weeks' time and 2 of them started playing post 8 weeks' time. Our study included teenage and pre-adolescent age population who are unaware of basic preventive measures related to Ankle injuries since it is beginning of their sports career. In this study, football players undergone an injury within the last 6 months were taken for further assessment. 17 football players were assessed for foot posture index and Ankle proprioception. Out of the 17 players, 7 of them had a supinated Ankle, 1 had a pronated Ankle while the other 9 had a normal FPI score. It was seen previously that if the foot at the Ankle is more supinated or pronated, higher is the chance of undergoing an Ankle injury. Previous studies showed that pronated foot as well as supinated foot increase the risk of overuse lower limb injuries¹². In our study it was seen that supinated foot is one of the risk factors for Ankle injury.

As per inclusion criteria participants with injury within last 6 months was considered. Thus criteria selection was with the consideration that players with more than 6 months injury could be having change in altered foot posture due to injuries. Whereas, due to this criteria we could have only 17% players for further analysis (Table no 3). The number of players available to establish association between FPI and Proprioception could have been a reason to have statistically non-significant correlation in our study. We may suggest to have study considering players from higher competitive levels (Table 1) and with more study population in future.

CONCLUSIONS

The incidence of Ankle injuries in football players was found to be 30% in our study. The association of Foot Posture Index and Ankle proprioception was not established in our study.

REFERENCES

- Muracki, J., Klich, S., Kawczyński, A., & Boudreau, S. A. (2021). Injuries and Pain Associated with Goalkeeping in Football—Review of the Literature. *Applied Sciences*, 11(10), 4669.
- Mallo, J., & Dellal, A. (2012). Injury risk in professional football players with special reference to the playing position and training periodization. *The Journal of sports medicine and physical fitness*, 52(6), 631-638.
- Alentorn-Geli, E., Myer, G. D., Silvers, H. J., Samitier, G., Romero, D., Lázaro-Haro, C., & Cugat, R. (2009). Prevention of non-contact anterior cruciate ligament injuries in soccer players. Part 2: a review of prevention programs aimed to modify risk factors and to reduce injury rates. *Knee surgery, sports traumatology, arthroscopy*, 17, 859-879.
- Tyler, T. F., Mchugh, M. P., Mirabella, M. R., Mullaney, M. J., & Nicholas, S. J. (2006). Risk factors for noncontact Ankle sprains in high school football players: the role of previous Ankle sprains and body mass index. *The American journal of sports medicine*, 34(3), 471-475.
- Cherati, A. S., Dousti, M., & Younespour, S. (2016). Association between foot posture index and Ankle sprain in indoor football players. *Glob J Health Sci*, 8(10), 51426.
- Walls, R. J., Ross, K. A., Fraser, E. J., Hodgkins, C. W., Smyth, N. A., Egan, C. J., ... & Kennedy, J. G. (2016). Football injuries of the Ankle: A review of injury mechanisms, diagnosis and management. *World journal of orthopedics*, 7(1), 8.
- Halabchi, F., & Hassabi, M. (2020). Acute Ankle sprain in athletes: Clinical aspects and algorithmic approach. *World journal of orthopedics*, 11(12), 534.
- Kumar, S. S., Jadhav, K. G., & Pagare, S. (2008). A pilot study examining injuries in relation to field position of competitive football players. *Journal of Exercise Science and Physiotherapy*, 4(1), 50-54.
- Chomiak, J., Junge, A., Peterson, L., & Dvorak, J. (2000). Severe injuries in football players. *The American journal of sports medicine*, 28(5 suppl), 58-68.
- Han, J., Anson, J., Waddington, G., Adams, R., & Liu, Y. (2015). The role of Ankle proprioception for balance control in relation to sports performance and injury. *BioMed research international*, 2015.
- Khan, F. R., Chevidikunnan, M. F., Mazi, A. F., Aljawi, S. F., Mizan, F. H., BinMulyah, E. A., ... & Al-Lehidan, N. S. (2020). Factors affecting foot posture in young adults: a cross sectional study. *Journal of Musculoskeletal & Neuronal Interactions*, 20(2), 216.
- Cain, L. E., Nicholson, L. L., Adams, R. D., & Burns, J. (2007). Foot morphology and foot/Ankle injury in indoor football. *Journal of science and medicine in sport*, 10(5), 311-319.
- Fu, A. S., & Hui-Chan, C. W. (2005). Ankle joint proprioception and postural control in basketball players with bilateral Ankle sprains. *The American journal of sports medicine*, 33(8), 1174-1182.
- Steinberg, N., Adams, R., Ayalon, M., Dotan, N., Bretter, S., & Waddington, G. (2019). Recent Ankle injury, sport participation level, and tests of proprioception. *Journal of Sport Rehabilitation*, 28(8), 824-830.