

Prevalence and Impact of Chronic Ankle Instability in Teenage Athletes

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DOI: <https://doi.org/10.52403/ijhsr.20230701>

Abstract: ***Background:** The prevalence and impact of chronic ankle instability (CAI) in teenage athletes are unknown. To better develop and justify prevention strategies of lateral ankle sprains and CAI, it is important to understand the origin and associated long-term impact of CAI within populations other than adults. **Objective:** To find the prevalence and impact of chronic ankle instability (CAI) in teenage athletes. **Study Design:** Cross-sectional study. **Methods:** A 73 healthy athletes across sport facilities and high schools fulfilling inclusion criteria completed paper-and-pencil surveys to establish the presence of CAI to check ankle function with the scales Foot and Ankle Ability Measure [FAAM] Activities of Daily Living along with FAAM - Sport subscale. **Results:** The overall prevalence of CAI was 93.13%. The population of 73 subjects [45 male and 28 female] were surveyed for the prevalence of ankle instability in teenage athlete's age group 12 - 18 years. Out of 73 subjects FAAM SCORE were no pain 5 [6.84%] and pain in 68 [93.13%] subjects. Therefore, the prevalence of ankle instability was 93.13%. **Conclusion:** The prevalence of CAI was higher among teenage athletes. The Chronic ankle instability negatively affected and alter the ankle function and HRQoL in teenage athletes. There is high prevalence and negative impact of CAI in a teenage athletes, various strategies to prevent ankle injuries and maintain physical activity are important to reduce future long-term consequences associated with development of CAI. These strategies needed to be implemented as soon as sport participation begins, as it appears that the origin of CAI may occur before adulthood.*

Keywords: Foot and Ankle Ability Measure [FAAM]

1. Introduction

Lateral ankle sprains are among the most common injuries experienced during sports participation. Ankle sprains are very common not only in the sporting population¹ but also in the general community.¹ The ankle functions as a complex with contributions from the talocrural, subtalar, and inferior tibiofibular joints. Each of these joints must be considered in the pathomechanics and pathophysiology of lateral ankle sprains and chronic ankle instability.² Lateral ankle sprains typically occur when the rear foot undergoes excessive supination on an externally rotated lower leg.² Recurrent ankle sprain is extremely common; in fact, the most common predisposition to suffering a sprain is the history of having suffered a previous ankle sprain.³ Chronic ankle instability may be due to mechanical instability, functional instability, or most likely, a combination of these 2 phenomena.³ Mechanical instability may be due to specific insufficiencies such as pathologic laxity, arthrokinematic changes, synovial irritation, or degenerative changes.³ Functional instability is caused by insufficiencies in proprioception and neuromuscular control.⁴ The ankle complex comprises 3 articulations: the talocrural joint, the subtalar joint, and the distal tibiofibular syndesmosis. These 3 joints work in concert to allow coordinated movement of the rearfoot. Rearfoot motion is often defined as occurring in the cardinal planes as follows: sagittal-plane motion (plantar flexion - dorsiflexion), frontal-plane motion (inversion/eversion) transverse-plane motion (internal rotation - external rotation).⁴ Rearfoot motion, however, does not occur in isolation in the individual planes; rather, coordinated movement of the 3 joints allows the rearfoot to move as a unit about an axis of rotation oblique to the long

axis of the lower leg.⁴ Rearfoot motion does not occur strictly in the cardinal planes because the talocrural and subtalar joints each have oblique axes of rotation. Coupled rearfoot motion is best described as pronation and supination. In the open kinetic chain, pronation consists of dorsiflexion, eversion, and external rotation, while supination consists of plantar flexion, inversion, and internal rotation.⁵ In the closed kinetic chain, pronation consists of plantar flexion, eversion, and external rotation, while supination consists of dorsiflexion, inversion, and internal rotation.²⁵ The 3 major contributors to stability of the ankle joints are (1) the congruity of the articular surfaces when the joints are loaded, (2) the static ligamentous restraints, and (3) the musculotendinous units, which allow for dynamic stabilization of the joints. "Ankle sprains are the most common injury sustained by athletes and active individuals. These injuries often occur in sports or activities that involve running, stopping and starting quickly or cutting and changing directions. Ankle sprains often occur when the individual plants their weight on the edge of their foot or lands on uneven ground or another player's foot, causing an awkward moment and loss of balance. Athletes often feel a 'pop' when the ligaments surrounding the ankle stretch or tear. In some cases, the pain is minimal and quickly goes away while in other cases the sprain is more serious which results in swelling and pain while walking and/or running. Lateral ankle sprain is thought to be suffered by men and women approximately the same rates. However, one recent report suggest that female interscholastic and intercollege basketball player have 25% greater risk of incurring grade I ankle sprain than male counterparts

Volume 12 Issue 7, July 2023

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2. Materials & Methods

- Study Design: Cross Sectional Study
- Study Type: Prevalence
- Study Duration: 6 Months
- Sample Size: 73 Patients
- Sampling Method: Simple Sampling
- Place Of Study: Nanded
- Study Population: Teenage Athletes

Statistical Analysis

Data analysis was done using the Statistical Package for Social Sciences (SPSS version 21). Basic descriptions were presented in the form of percentages. Simple bar Graph & pie chart were used to depict the foot and ankle ability measure.

3. Result

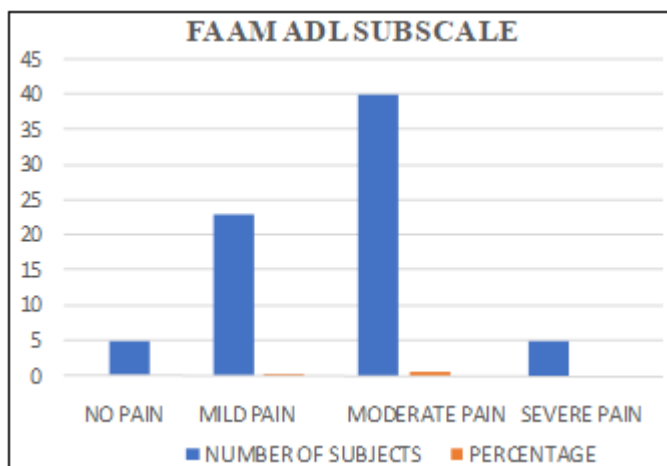
The population of 73 subjects [45 male and 28 female] were surveyed for the prevalence of ankle instability in teenage athlete's age group 12 - 18years. Out of 73 subjects FAAM SCORE were no pain 5 [6.84%] and pain in 68 [93.13%] subjects. Therefore, the prevalence of ankle instability was 93.13%. On further classification it was found that 5 [6.84%] subjects have no pain, 23 [31.50%] subjects have mild pain, 40 [54.79%] have moderate pain, and 5 [6.84%] have severe pain. The intensity variables were used here as the measure of ankle instability.

FAAM ADL Score

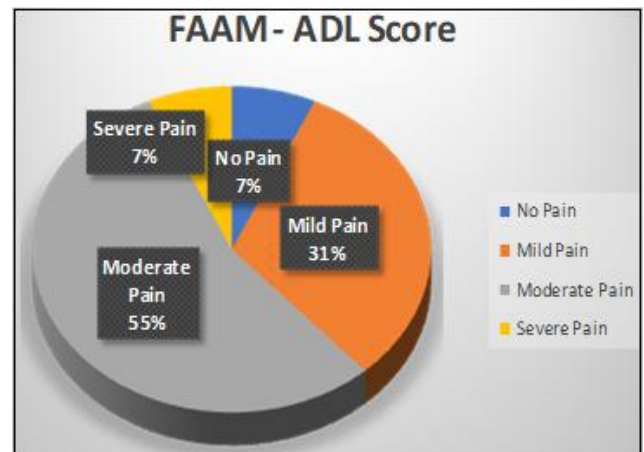
Pain Intensity	Number of Subjects	Percentage
No Pain	5	6.84%
Mild Pain	23	31.50%
Moderate Pain	40	54.79%
Severe Pain	5	6.84%

FAAM Sport Subscale

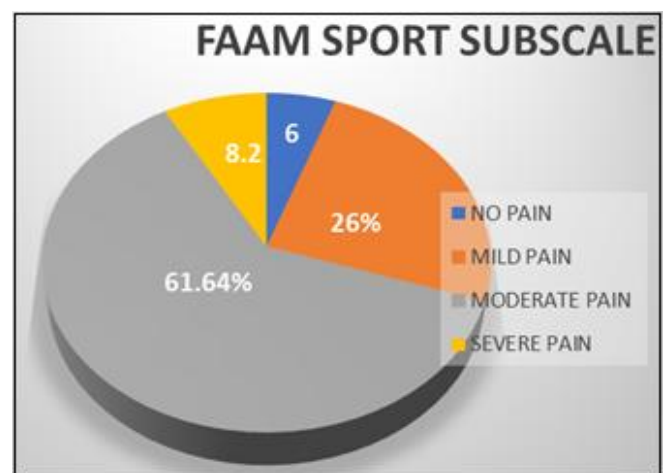
Pain Intensity	Number of Subjects	Percentage
No Pain	4	5.47%
Mild Pain	18	24.65%
Moderate Pain	45	61.64%
Severe Pain	6	8.21%



Histogram of FAAM ADL Score



Pie Chart 1: FAAM - ADL Score in Teenage Athletes



Pie Chart 2: FAAM Sport Subscale Score in Teenage Athletes

4. Discussion

Study was conducted On 73 peoples in age group of 12 to 18 year. This study was done to observe the prevalence and impact of chronic ankle instability in teenage athletes. Subject were selected based on inclusion and exclusion criteria. procedure was explained and return concept was taken foot and ankle ability measure [FAAM] scale used. Lateral ankle sprains have consistently been reported as the most common musculoskeletal injuries to occur in physically active patients. The primary purpose of this cross - sectional survey study was to provide an estimate of the prevalence of CAI and the impact of the condition on ankle function, HRQoL, and physical activity in teenagers who participate in organized sports. The aim of the study was not to identify risk factors or establish the prevalence of injuries across sports but rather determine whether CAI is problematic within an teenage population, given that the majority of CAI literature pertains to patients older than 18 years. Based on 73 teenage athletes across high schools in Nanded, we found the overall prevalence of CAI to be 93.13% Therefore, at any given time, we would expect about 93% of teenagers who participate in sports to have CAI. The impact of CAI and acute ankle sprains has been studied in young adults from a university setting. Both of these studies found that patients with a previous ankle

sprain are significantly less physically active than matched controls with no history of ankle sprains. The combination of the available literature^{22, 25, 26} and our results suggest that physical activity may not immediately be compromised in teenagers, despite the reduced levels of perceived foot and ankle function and HRQoL, however it can become negatively affected by CAI and can decline in early adulthood. When synthesizing our results, it appears that to have a substantial impact on the long - term consequences and financial burden associated with ankle sprains and CAI, prevention programs must target youth sports. Especially when considering that 93% of the participants within this study reported CAI, it is likely that the origin of this condition for many participants occurred before adolescence (aged 14 - 18 years). Future research should aim to (1) identify intrinsic and extrinsic risk factors of ankle sprains and CAI, (2) refine treatment programs to tailor to teenagers, and (3) implement prevention programs to decrease injury occurrence rates.

5. Conclusion

The prevalence of CAI was higher among teenage athletes. The Chronic ankle instability negatively affected and alter the ankle function and HRQoL in teenage athletes. There is high prevalence and negative impact of CAI in an teenage athletes, various strategies to prevent ankle injuries and maintain physical activity are important to reduce future long - term consequences associated with development of CAI. These strategies needed to be implemented as soon as sport participation begins, as it appears that the origin of CAI may occur before adulthood.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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