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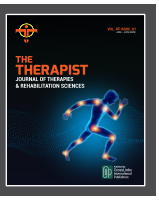

Original Article

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Prevalence of Anterior Cruciate Ligaments and Medial Cruciate Ligaments Injuries in Strikers in Football Players

Hamza Javid[1], Mariam Liaqat[1*], Sana Tauqeer[1] and Taimoor Ahmed[1]

[1]University Institute of Physical Therapy, The University of Lahore, Lahore, Pakistan

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***Corresponding Author:**
Mariam Liaqat
University Institute of Physical Therapy, The University of Lahore, Lahore, Pakistan
mariam.liaquat@uipt.uol.edu.pk

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ABSTRACT

Stability of the knee is greatly supported in football by the Anterior Cruciate Ligament (ACL) and Medial Cruciate Ligament (MCL). Frequent changes in speed and direction, together with crashes, cause strikers to have increased chances of injuring their tendons and ligaments. **Objective:** To determine the prevalence of anterior cruciate ligaments and medial cruciate ligaments in strikers in football players. **Methods:** A cross-sectional study was carried out for four months across several teams of the 169 men, all were strikers, had least two years of playing experience and a past ACL or MCL injury. Lysholm Knee Scoring Scale used for assessment. SPSS version 26.0 was used for analysis of data. **Results:** Out of the 169 participants, 57.4% went through an ACL injury, and 38.5% had experienced MCL injury. A total of 63.3% of people had a slight/periodical limp, and 49.1% usually used canes or crutches for walking, as they reported. Out of all the participants, 51.5% scored below 65 in the Lysholm Knee Scoring, 37.9% scored between 65 and 83, 6.5% scored between 84 and 90, and only 4.1% scored above 91. 91.7% of patients displayed symptoms of the right knee. The majority of injuries happened in matches (61.5%), and most of those were semi-contact injuries (45.6%). **Conclusion:** The study showed that football strikers experienced ACL injuries in 57.4% of cases and MCL injuries in 38.5% of cases. Based on Lysholm scoring, 51.5% of the patients had knee function that was poor, and only 4.1% received excellent scores.

INTRODUCTION

The knee joint, a pivotal synovial hinge joint, plays an essential role in weight-bearing and complex locomotor activities, particularly in high-impact sports such as football [1]. The joint stabilized by ligaments as the Anterior Cruciate Ligament (ACL) prevents anterior translation of the tibia on the femur and controls rotational forces, while the Medial Cruciate Ligaments (MCL) resists valgus stress and provides medial stability [2]. Due to the rapid changes of direction, acceleration, deceleration, pivoting, and regular contact involved in football, these ligaments are particularly at risk for injury - especially the strikers due to the more explosive, aggressive demands of the position. Worldwide, ACL injuries happen annually to around 81.7 per 100,000 people, with most occurring during football primarily to males aged 20-49. In Pakistan there were limited understanding of the epidemiology, but studies indicate a higher prevalence of ACL and MCL injuries occurring due to greater participation in football and lack of opportunities to participate in appropriate training and rehabilitation. The MCL is the most common ligament injury of the knee and is symptomatic of injury to the ACL in 75-90% of instances. The MCL injuries also represented nearly 40% of all ligament injuries to the knee [3]. In football players, strikers that continuously kick the football, jump frequently, and crash into defenders during high-speed situations are more likely to experience ACL injuries [4]. The underlying causes of ACL and MCL injuries in football strikers can be broadly categorized into contact and non-

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contact mechanisms. Non-contact injuries often occur due to sudden deceleration, pivoting, awkward landings, or changes in direction without external force. Contact injuries typically result from direct impact to the lateral or posterior knee during tackles [5, 6]. Additionally, the inadequate neuromuscular control, muscular imbalances, especially weak hamstrings in relation to quadriceps, fatigue, poor warm-up, poor core stability, poor footwear, and playing surfaces, especially hard or artificial turf [7]. Narrow intercondylar notch, valgus knee directionality, and generalized ligamentous laxity, and returning to play anxiety, may also affect biomechanics and susceptibility [8]. A clinical evaluation includes a thorough history with details about the circumstances of the injury, associated symptoms of a "pop," immediate swelling, feelings of instability, any functional limitations, effusion, range of motion loss, tenderness to palpation over the medial joint line [9]. During the physical examination a variety of special tests are used including the Lachman test and anterior drawer test to assess ACL integrity and a valgus stress test at 30 degrees of knee flexion for MCL testing Abreu *et al.,* in 2023 [10]. Magnetic Resonance Imaging (MRI) is the gold standard for detecting ligamentous injuries, revealing partial or complete tears, associated meniscal injuries, bone bruises, and other soft tissue damage [11, 12]. Management done conservatively with rest, ice, compression, elevation (RICE), Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), functional bracing, and physiotherapy aimed at restoring joint stability, flexibility, and muscle strength [13]. Progressive loading exercises, proprioceptive training, and return-to-play protocols are essential components of non-operative care [14]. Hosseininejad *et al.,* in 2024 reported 70.9% had ACL tears in 285 subjects in which 79% had Noncontact ligament injury knee pivoting (54%) especially in military (63.9%) and sports (32.6%) activities [15]. Furthermore, Joshi *et al.,* in 2022 supported in 33.3% ACL injury was due to Sports activities Alqarni *et al., i*n 2022 mentioned 15 and 40 years athletes had years, revealing a prevalence of 14.7% [16, 17]. ACL injuries occurring on either artificial turf (44.7%) or dirt football fields (34%) as an important risk factor [17]. Szymski *et al.,* in 2022 supported the incidence of ACL injuries was highest in amateur football mostly associated with previous ACL injury (23.3%), prior knee injuries (19.3%) and stepping up in league (24.2%) [18]. Inclan *et al.,* in 2021 found an average of 66% of all ACL injuries accounted for with a variance depending on the position of the players: 86% in skill athletes, 72% in midskill athletes, and 61% in linemen [19]. Prior research has documented that Anterior Cruciate Ligament (ACL) injuries are one of the most prevalent musculoskeletal injuries in football players; strikers being the most commonly injured position (as a function of sport). However, a substantial literature gap exists with regards to the prevalence or pattern of knee injuries involving MCL injuries, in particular with respect to football strikers in Pakistan. In Therefore, this research aimed to investigate the prevalence of both ACL and MCL injuries among football strikers in Pakistan that may generate important information for position-specific needs in terms of injury prevention, management, and rehabilitation.

METHODS

The study used a descriptive cross-sectional study design following the University of Lahore Ethical Review Committee guidelines. Musculoskeletal injuries in football vary by player position and team dynamics. Murtaza *et al.,* in 2022 found positional differences in injury patterns between defenders and strikers [20]. Gupta *et al.,* in 2020 highlighted a high prevalence of knee injuries, particularly ACL tears, among football players [21]. Sandon *et al.,* in 2022 reported increased ACL injuries in teams undergoing coaching changes or moving to higher divisions [22]. Exclusion criteria were people with AIC pains, a non-ACL/MCL-involved knee injury, history of knee surgery, severe systemic medical illness, or mental illness, and active football obtaining participants [20, 22]. The participants were informed about the purpose and procedures involved in the study, signed informed consents and they were guaranteed that their identities will be withheld fully and not revealed anywhere. Data collection process was done through use of subjective and objective measures taken by a trained physiotherapist. Data were collected including age, favorite leg, number of hours of play per week and present occupation. Then the Lysholm Knee Scoring Scale (LKSS) was tasked to the participants. LKSS used for evaluating knee functioning. This assessment device has eight critical areas as limp, support, locking, instability, pain, swelling, stair climbing, and squatting. The ICC between 0.94 and 0.98 and Cronbach alpha of 0.71 and 0.73 indicate that it is a reliable and valid tool of evaluating the functional status in patients with ligamentous knee injuries [23]. After completion, the scores were summarized to evaluate prevalence and functional status of ACL and MCL injuries. SPSS version 26.0 was used to compute statistical data. The continuous variables like age were indicated in mean standard deviation and categorical variables were represented in frequencies and %ages.

RESULTS

The results shown in tabulated form. Table 1 shows demographic data as within the 169 male respondents enrolled in football, most (45.0%, n=76) fell in the age category of 18-24 years, 34.3% (n=58) had the age range of

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25-30 years and 20.7% (n=35) had the age bracket of 31-35 years. Concerning the experience in football, 12.4 % (n=21) had played less than 1 year, 44.4 % (n=75) 1-3 years and 43.2 % (n=73) 3-5 years. Frequency of playing each week indicated that 0.6 % (n=1) never played, 18.3 % (n=31) played 1-2 times, 45.0 % (n=76) played 3-4 times, 16.6 % (n=28) played 5-6 times, and 19.5 % (n=33) played every day. The most commonly affected knee relationship was the right knee that contributed to 91.7% (n=155) of the participants with the left knee involvement recorded in 8.3 % (n=14). The occurrence of injury during matches stood at 61.5 (n=104) % and 38.5 (n=65) % during training. The most common injuries were semi-contact (45.6%, n=77) and full-contact (37.9%, n=64) and non-contact (16.6%, n=28). Regarding the time period out of play, 18.3% (n=31) were out of less than 1 month 45.0% (n=76) out of 1-3 months 17.2% (n=29) out of 3-6 months 19.5% (n=33) out of more than 6 months.

Table 1: Demographics Characteristic of Participants (n=169)

Variables	Category	Frequency (%)
Age	18-24	76 (45.0)
	25-30	58 (34.3)
	31-35	35 (20.7)
Gender	<1 year	21 (12.4)
	1-3 years	75 (44.4)
	3-5 years	73 (43.2)
Frequently play/week	0	1 (0.6)
	1-2 time	31 (18.3)
	3-4 time	76 (45.0)
	5-6 time	28 (16.6)
	daily	33 (19.5)
	Total	169 (100.0)
Affected Knee	Right	155 (91.7)
	Left	14 (8.3)
Event of injury	During match	104 (61.5)
	During training	65 (38.5)
Type of injury	Full contact	64 (37.9)
	Semi contact	77 (45.6)
	No contact	28 (16.6)
Duration out of play	< 1 month	31 (18.3)
	1-3 months	76 (45.0)
	3-6 months	29 (17.2)
	> 6 months	33 (19.5)

Table 2 shows the prevalence of injury as 57.4% of participants (n=97) had a history of anterior cruciate ligament (ACL) injury and 42.6 % of participants (n=72) had no history. Injuries of the medial cruciate ligament (MCL) were present in 38.5 % (n=65) of the respondents.

Table 2: Prevalence of Injury (n=169)

Variables	Category	Frequency (%)
ACL Injury	Yes	97 (57.4)
	No	72 (42.6)
MCL Injury	Yes	65 (38.5)
	No	104 (61.5)

Table 3 shows intensity of pain was measured using the right knee and 51.0% (n=79) had moderate pain with 38.7% (n=60) having high pain, 7.7% (n=12), mild pain, including 2.6% (n=4) with no pain. Of the sample showing left knee involvement (n=14), 57.1% (n=8) experienced moderate pain, 21.4% (n=3) severe pain, 7.1% (n=1) mild pain, and 14.3% (n=2) no pain.

Table 3: Specific Knee Pain among Participants

Affected Knee	Variables	Frequency (%)
Right Knee	Severe Pain (7-10)	60 (38.7)
	Moderate Pain (4-5)	79 (51.0)
	Mild Pain (1-3)	12 (7.7)
	No Pain (0)	4 (2.6)
	Total	155 (100.0)
Left Knee	Severe Pain (7-10)	3 (21.4)
	Moderate Pain (4-5)	8 (57.1)
	Mild Pain (1-3)	1 (7.1)
	No Pain (0)	2 (14.3)
	Total	14 (100.0)

According to Table 4, Lysholm Knee Scoring Scale (LKSS), 63.3% were having moderate or occasional limp, 21.3% were not having limp, and 15.4% had major and continuous limp. The use of assistive devices demonstrated that 49.1 % utilized crutches/canes, where there was partial load transference, 26.6 % used no assistance and 24.3 % utilized the affected leg. A lack of locking was reported by 23.7 % of participants, as was catching to an extent of 43.2 %, occasional locking (7.1 %), frequent locking (17.8 %), and locked now (8.3 %). On instability, 43.2 % said that their knee seldom yielded, 25.4 % reported knee give-way, and the rest had frequent knee give-ways either in physical (7.7 %) or daily (17.8 %) routines. The %age of participants experiencing pain during intense activities was 48.5%, 22.5% had no pain, and 28.9% reported the occurrence of marked pain. Post exercise swelling was evaluated in 50.9%, 23.1% reported general swelling, 15.4% were constancy swelling and 10.7% swelling after normal exercise. In stair climbing, most people experienced slight difficulty in climbing (43.2 %) with some experiencing no problem climbing (20.7 %), others managed to climb on the stairs once (18.9 %), and others were not able to climb (17.2 %). Among squatting, 36.1 of the respondents had mild difficulty, 30.2 of them were not able to squat more than 90 degrees, 11.8 people considered it to be impossible, and 21.9 did not have the problem. Lysholm final grade revealed

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that 51.5 % (n=87) marked poor knee functioning (<65), 37.9 % (n=64) were graded as fair (65-83), 6.5 % (n=11) had good (84-90) and only 4.1 % (n=7) had an excellent score (91-100).

Table 4: Distribution of study participants according to Lysholm Scoring Scale

Variables	Category	Frequency (%)
Limp	I have no limp	36 (21.3)
	Slight/ periodical limp	107 (63.3)
	Severe and constant limp	26 (15.4)
Using cane or crutches	Don't use cane / crutchLKSS	45 (26.6)
	Use cane/ crutches with some weight bearing	83 (49.1)
	Putting weight on hurt leg	41 (24.3)
Locking sensation in the knee	No locking	40 (23.7)
	Catching sensation but no locking	73 (43.2)
	Locks occasionally	12 (7.1)
	Locks frequently	30 (17.8)
	Locks at this moment	14 (8.3)
Giving way sensation from the knee	knees give away	43 (25.4)
	Knees rarely give away	73 (43.2)
	Frequently give away during physical activities	13 (7.7)
	Frequently give away during daily activities	30 (17.8)
	Often give away during daily activities	10 (5.9)
Pain	No pain	38 (22.5)
	Slight pain during vigorous activities	82 (48.5)
	Marked pain during vigorous activities	11 (6.5)
	Marked pain during / after walking > 1 mile	25 (14.8)
	Marked pain during / after walking < 1 mile	13 (7.7)
Swelling	Swelling in knee	39 (23.1)
	Swelling after vigorous activities	86 (50.9)
	Swelling after ordinary activities	18 (10.7)
	Swelling constantly	26 (15.4)
Climbing stairs	No problem	35 (20.7)
	Slight problem	73 (43.2)
	Climb only one time	32 (18.9)
	Climbing is impossible	29 (17.2)
Squatting	No problem	37 (21.9)
	Slight problem	61 (36.1)
	Cannot squat beyond 90*	51 (30.2)
	Impossible squatting	20 (11.8)

DISCUSSION

The purpose of the present study was to investigate the prevalence of Anterior Cruciate Ligament (ACL) and Medial Cruciate Ligament (MCL) injuries in football strikers, with an emphasis on injury patterns and the associated risk factors. The findings indicate that 57.4% of participants experienced ACL injuries, while 38.5% sustained MCL injuries. These results underscore the high incidence of knee ligament injuries, particularly among strikers, who frequently engage in high-intensity maneuvers involving abrupt direction changes and physical contact, which contribute to the increased vulnerability of the ligaments.

The higher incidence of ACL injuries observed in the current study aligns with prior research, including the study by Joshi *et al.*, in 2022, who found a 33.3% prevalence of ACL injuries among football players at a tertiary trauma center in Nepal [16]. This finding is additionally supported by findings of Gupta *et al.*, in 2020, who indicate a significant increased risk of ACL injuries with a 144-220 times increased risk in cutting, tackling, or pivoting sports, such as kabaddi and football [21]. Both articles have highlighted that football is a very dynamic sport that places a lot of load/strain on the ACL, hence increasing the risk of injury. The prevalence of MCL injuries in this study adds another piece to the puzzle of understanding knee ligament injuries. Although MCL injuries are less prevalent than ACL injuries, they remain clinically relevant, as demonstrated by the 38.5% prevalence rate found in this study. These findings were consistent with research conducted by Cristiani *et al.*, in 2024 who presented a lot of MCL findings in subjects that had tears in the ACL; however, MCL injuries were not the primary outcome, but rather a comparable outcome measure [24]. Here, the MCL finding adds to the current study explains the need for the data regarding MCL injuries when considering overall knee ligament injuries. This study's participants' mean age was 23.5 ± 4.8 years old, which is around the peak physical activity years of the football players. This finding aligns with Szymski *et al.*, in 2022, which reported that amateur football players sustained greater ACL injuries than professional players likely related to having access to varying amounts of training or training resources and injury prevention programs [18]. While ACL injury rates in professional sports by Palmieri-Smith *et al.*, in 2021 and Inclan *et al.*, in 2021 studies can be rather high for NFL players, elite football has different elements than other sports, and this presents uncertainty in drawing meaningful comparisons. (Including biomechanics, equipment, and turf) limit the applicability of these results to amateur football players [19, 25]. In the current investigation, injuries occurred most often during match play (61.5%), as semi-contact and full-contact instances also occurred often (with 45.6% doing semi-contact and 37.9% during full-contact play). The outcomes of this study are consistent with the research you find in the literature with Hosseininejad *et al.*, in 2024. For the investigation conducted by Hosseininejad *et al.*, in 2024, the authors identified that high-risk activities include rapid changes in direction and landing, which can quickly lead to ACL injuries with service personnel [15]. And with Schiffner *et al.*, in 2018, high intensity actions performed in matches were also confirmed to place elite soccer players at a greater risk of ACL ruptures [26]. The above investigations show that activities related to match play are important contributors

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to the source of ACL injuries. This may be especially true for strikers that are often taking part in the periodic number of high-intensity, physical actions. The results of the current study add to the emerging literature that reveals ACL injuries as a significant issue within sports, particularly in football. Although ACL injuries are the most common injury to the knee while participating as a football striker, this study also emphasizes that MCL injuries, while common, are not always considered in the same light as ACL, highlighting a different injury risk. Having its own strength still study had some limitations. Initially, this research is that it employs a convenience sampling method, and thus the outcomes cannot be generalized to all football players in Pakistan. The participants were not chosen randomly thus the sample might not reflect players in various regions or competitive divisions as footballers. The second limitation is that injury history relied on self-reported information as opposed to a confirmed medical diagnosis or imaging e.g., MRI. Based on these limitations, future researches are encouraged to consider implementing a better sampling, like random or stratified sampling, so that a more comprehensive representation is captured in different regions and in different playing levels across Pakistan. Moreover, the addition of female athletes and those representing other types of sports might provide a broader look at the pattern of ACL and MCL injuries regarding gender and athletic type, which would eventually be applied to more diverse and efficient injury prevention practices.

CONCLUSIONS

The study concluded that ligament injuries were highly prevalent in footballer as 57.4% of football strikers experienced injuries to the anterior cruciate ligament and 38.5% experienced injuries to the medial cruciate ligament. In addition, 51.5% experienced weak and poor knee function (Lysholm score < 65), whereas only a 4.1% achieved an exceptional knee result (91–100).

Authors Contribution

Conceptualization: HJ, ML
Methodology: ML, ST, TA
Formal analysis: ML, ST, TA
Writing, review and editing: ML, ST, TA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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