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Original Article

Association of Medial Tibial Stress Syndrome with Proprioception, Foot Function and Balance Among Cricketers: A Cross-Sectional Study

Sabiha Arshad[1,2], Hamna Khan[2], Esha Naseem[2], Areeba Shahid[2], Lubaba Butt[2], Sana Fatima[2], Hira Meer[2]

[1] Graduate Institute of Acupuncture Science, College of Chinese Medicine, China Medical University, Taiwan.
[2] Riphah College of Rehabilitation and Allied Health Sciences, Riphah International University, Lahore, Pakistan.

✉ **Correspondence:** Sabiha Arshad, bia_arsh@yahoo.com

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ABSTRACT

Background: Medial tibial stress syndrome (MTSS) affects physically active populations, but clinical differences between new-onset and recurring presentations among cricketers remain insufficiently characterized. Objective: To examine associations of MTSS presentation with proprioception, foot function, and dynamic balance among cricketers. Methods: This cross-sectional study included 148 cricketers with MTSS recruited through convenience sampling from clubs and academies in Lahore, Pakistan. Assessments included joint position sense (JPS), Foot Function Index, Y-Balance Test, navicular drop, manual muscle testing, and single-leg stance. Associations were evaluated using exact tests, Holm adjustment across four comparisons, and crude conditional odds ratios with exact 95% confidence intervals. Results: Participants comprised 35 (23.6%) new-onset and 113 (76.4%) recurring cases. Bilateral JPS impairment occurred in 12 (34.3%) and 10 (8.8%), respectively. JPS classification was associated with MTSS presentation (exact p = 0.002; adjusted p = 0.008). The odds ratio for bilateral impairment versus normal JPS, comparing new-onset with recurring cases, was 5.193 (95% CI: 1.782–15.590). Left-leg dynamic balance yielded p = 0.041 but adjusted p = 0.124. Right-leg dynamic balance and foot function yielded p = 0.139 and p = 0.153, respectively. Conclusion: JPS classification differed between MTSS presentations after multiplicity adjustment. Dynamic balance and foot function showed no clear associations after adjustment. These findings characterize affected cricketers without establishing causation or recurrence risk. Keywords: Medial tibial stress syndrome; cricket; proprioception; joint position sense; foot function; balance.

INTRODUCTION

Medial tibial stress syndrome (MTSS) is an exercise-related condition characterized by pain along the posteromedial border of the tibia and is commonly encountered in physically active populations. Repetitive loading during sporting activity is central to its clinical presentation, while its development has been considered in relation to interacting biomechanical, anatomical, and training-related factors (1,2). In cricket, repeated running, bowling approaches, fielding, and changes of direction make lower-limb function an important consideration when assessing

symptomatic players. Understanding the clinical characteristics of cricketers with MTSS may therefore help identify assessment priorities and inform questions for subsequent rehabilitation research.

Previous research has examined MTSS predominantly in runners and other athletic populations. Studies of runners with a history of MTSS have investigated lower-extremity biomechanics, while systematic review evidence has considered factors associated with the condition in novice and recreational runners (3,4). These investigations provide a foundation for examining lower-limb function but do not establish whether the same relationships apply to cricketers or whether clinical findings differ between first and recurring episodes. Differences in sporting tasks and exposure patterns make direct extrapolation between athletic populations uncertain.

Foot mechanics and ankle muscle function are relevant to this assessment because they contribute to the mechanical demands of locomotion. The foot actively adapts its muscular work to locomotor requirements, indicating that its contribution extends beyond passive support (5). Inversion and eversion strength balance has also been investigated in individuals with MTSS, supporting consideration of ankle muscle function alongside other clinical measures (6). However, foot posture, muscle strength, and perceived foot-related disability represent distinct constructs. Their assessment should therefore distinguish structural or mechanical characteristics from the functional limitations experienced by the athlete.

Proprioception provides information about body position and movement that contributes to motor control (7). Joint position sense testing assesses one component of proprioceptive accuracy, although the interpretation of findings depends on the joint examined and the measurement procedure used (8). Assessing joint position sense in cricketers with MTSS may help characterize sensorimotor function, but a deficit identified after symptom onset cannot establish whether altered proprioception preceded the condition or developed in association with pain and changes in activity. This distinction is particularly relevant when comparing new-onset and recurring presentations.

Foot function and balance provide complementary perspectives on the clinical presentation of MTSS. The Foot Function Index offers a patient-reported assessment of foot-related pain and functional limitations, and its measurement properties have been examined systematically (9). Dynamic balance can be assessed using the Y-Balance Test, although its interpretation requires attention to the population and testing protocol (10). Research examining single-leg landing in junior female athletes with a history of shin splints further illustrates the relevance of investigating balance in this condition, while also highlighting that different balance tasks assess different aspects of performance (11). Similarly, neuromuscular training research in youth female track-and-field athletes provides a related context for studying sensorimotor function, but intervention findings cannot establish the meaning of cross-sectional differences between MTSS presentations in cricketers (12).

An unresolved question is whether cricketers experiencing new-onset MTSS differ from those reporting recurring MTSS in proprioception, foot-related function, and balance. Examining these domains together may provide a more complete description of affected athletes than assessing any single measure in isolation. Evidence from cricketers in Lahore may also contribute to sporting and geographical context that is not directly represented by the runner-focused literature discussed above. Nevertheless, a comparison restricted to athletes with MTSS can characterize differences between presentations rather than determine factors associated with developing MTSS in previously unaffected individuals.

Accordingly, this cross-sectional study aimed to examine associations between MTSS presentation, classified as new-onset or recurring, and joint position sense, foot function, and right- and left-leg dynamic balance among cricketers in Lahore, Pakistan. Navicular drop, ankle inversion and eversion muscle strength, and static balance were assessed to describe the clinical characteristics of the study population.

MATERIAL AND METHODS

This analytical cross-sectional study examined associations between medial tibial stress syndrome (MTSS) presentation and proprioception, foot function, and dynamic balance among cricketers recruited from cricket clubs and academies in Lahore, Pakistan. Navicular drop, ankle muscle strength, and static balance were also assessed to characterize the study population. The study was conducted over four months following approval of the research

synopsis. The cross-sectional design enabled comparison of clinical findings between participants classified as having new-onset or recurring MTSS at the time of assessment.

Participants were recruited using non-probability convenience sampling. The stated eligibility criteria included male and female cricketers aged 18–30 years who had played cricket for at least one year and trained for at least 1.5 hours per day on three or more days per week. Clinical assessment for MTSS included exercise-induced pain along the distal two-thirds of the posteromedial tibial border, diffuse tenderness extending over at least 5 cm on palpation, a positive one-leg hop test, and assessment for other lower-limb pathologies. Cricketers were excluded if they had undergone foot or ankle surgery, had a history of traumatic foot or ankle injury, had musculoskeletal foot conditions such as arthritis or rheumatoid arthritis, had neurological or vestibular conditions, or used foot orthoses or other supportive devices.

The target sample size was calculated using the Raosoft Sample Size Calculator with an assumed population size of 220, a 95% confidence level, a 5% margin of error, and a 50% response distribution. These inputs yielded a recommended sample of 148 participants. The calculation provided a sample-size rationale based on estimation of a population proportion. The study included 148 cricketers, comprising 35 classified as having new-onset MTSS and 113 classified as having recurring MTSS.

Following eligibility screening and written informed consent, information was recorded using a structured data-collection form. Recorded characteristics included age, sex, height, weight, body mass index, playing experience, training frequency and duration, playing specialty, affected leg, and dominant leg. MTSS presentation was the grouping variable for the association analyses. The principal investigator conducted the clinical assessments under standardized test conditions, and right- and left-leg findings were recorded separately where applicable.

Proprioception was assessed using joint position sense testing, with joint-angle measurements obtained using a universal goniometer. Joint position sense represents a component of proprioceptive accuracy and requires interpretation in relation to the measurement procedure used (8). Findings were classified as normal, unilateral impairment, or bilateral impairment. Foot-related function was assessed using a self-administered Foot Function Index, an instrument whose measurement properties have been systematically evaluated (9). Foot Function Index findings were categorized as minimal, mild, or moderate dysfunction.

Navicular drop testing was used to assess medial longitudinal arch mobility in each foot. Recorded measurements were categorized as normal at 0–5 mm or mildly excessive at 6–10 mm. Ankle inversion and eversion strength were assessed bilaterally using manual muscle testing according to the Medical Research Council grading system. Static balance was assessed using the Single Leg Stance Test under eyes-open and eyes-closed conditions for each leg, with performance classified as normal or impaired. Single-leg stance testing has been examined for test–retest reliability, although reliability findings depend on the assessment protocol and equipment used (13). Dynamic balance was assessed separately for each leg using the Y-Balance Test, for which reliability and validity have been examined in a systematic review and meta-analysis (10). For the categorical analyses, scores of at least 94% were classified as normal and scores below 94% as impaired.

Data were entered and analyzed using IBM SPSS Statistics version 21.0. Categorical participant characteristics and clinical findings were summarized as frequencies and percentages. Percentages for the overall sample used a denominator of 148, while group-specific percentages used denominators of 35 for new-onset MTSS and 113 for recurring MTSS. The reported categorical analyses examined associations between MTSS presentation and joint position sense classification, Foot Function Index classification, and right- and left-leg Y-Balance Test classifications. Pearson's chi-square test was used for joint position sense and Foot Function Index comparisons. Two-sided Fisher's exact tests were used for the right- and left-leg Y-Balance comparisons, which contained small cell frequencies. Statistical significance was defined as $p < 0.05$. These comparisons were unadjusted; navicular drop, manual muscle testing, and static balance findings were summarized descriptively.

Ethical approval was obtained from the Institutional Review Board of Riphah International University, Lahore. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The purpose and procedures were explained to participants, and written informed consent was obtained before data collection.

RESULTS

A total of 148 cricketers were included, comprising 35 (23.6%) with new-onset MTSS and 113 (76.4%) with recurring MTSS. Most participants were male (141, 95.3%), and 105 (70.9%) were in the 15–20-year age category. Bowling was the predominant playing specialty (105, 70.9%). Training six days per week was reported by 85 participants (57.4%), while 91 (61.5%) trained for 4–5 hours per day. Right-sided symptoms were reported by 60 participants (40.5%), left-sided symptoms by 37 (25.0%), and bilateral symptoms by 51 (34.5%) (Table 1).

Navicular drop was classified as normal in 122 right feet (82.4%) and 128 left feet (86.5%). During single-leg stance with eyes open, impairment was recorded in six participants (4.1%) on the right and two (1.4%) on the left. With eyes closed, the corresponding frequencies were 120 (81.1%) and 118 (79.7%). Y-Balance performance was classified as impaired in 145 participants (98.0%) on the right and 144 (97.3%) on the left. Joint position sense was normal in 108 participants (73.0%), while 18 (12.2%) had unilateral impairment and 22 (14.9%) had bilateral impairment. Foot Function Index classifications were predominantly minimal (93, 62.8%) or mild (53, 35.8%) (Table 2). Manual muscle testing indicated normal inversion strength in 147 participants (99.3%) on each side and normal eversion strength in all 148 participants (100.0%) bilaterally (Table 3).

Bilateral joint position impairment occurred in 12 participants with new-onset MTSS (34.3%) and 10 with recurring MTSS (8.8%), whereas normal joint position sense was recorded in 20 (57.1%) and 88 (77.9%), respectively. Right-leg Y-Balance impairment occurred in 33 new-onset cases (94.3%) and 112 recurring cases (99.1%); left-leg impairment occurred in 32 (91.4%) and 112 (99.1%), respectively. Minimal Foot Function Index classifications were recorded in 18 new-onset cases (51.4%) and 75 recurring cases (66.4%) (Table 4).

Joint position sense classification was associated with MTSS presentation using the overall exact test ($p = 0.002$; Cramér's $V = 0.304$), and this association remained after Holm adjustment (adjusted $p = 0.008$). The left-leg Y-Balance comparison yielded an unadjusted p-value of 0.041 and Cramér's V of 0.201, but did not meet the significance threshold after adjustment (adjusted $p = 0.124$). The right-leg Y-Balance and Foot Function Index comparisons yielded exact p-values of 0.139 and 0.153, respectively (Table 5).

Compared with recurring cases, new-onset cases had greater odds of bilateral joint position sense impairment relative to normal classification (crude OR = 5.193; exact 95% CI, 1.782–15.590). The corresponding estimate for unilateral impairment was 0.881 (95% CI, 0.149–3.562). For left-leg Y-Balance impairment relative to normal performance, the crude OR was 0.097 (95% CI, 0.002–1.257). Mild Foot Function Index classification relative to minimal classification yielded an OR of 1.794 (95% CI, 0.762–4.214). The broad confidence intervals, particularly for balance and moderate foot dysfunction, indicated substantial uncertainty in the category-specific estimates (Table 6).

Table 1. Demographic and training characteristics of participants

Characteristic	Category	Total (N = 148), n (%)
Age (years)	15–20	105 (70.9)
Age (years)	21–25	31 (20.9)
Age (years)	26–30	6 (4.1)
Age (years)	31–35	6 (4.1)
Sex	Male	141 (95.3)
Sex	Female	7 (4.7)
MTSS presentation	New-onset	35 (23.6)
MTSS presentation	Recurring	113 (76.4)
Playing experience (years)	1–3	47 (31.8)
Playing experience (years)	4–6	55 (37.2)
Playing experience (years)	7–9	34 (23.0)
Playing experience (years)	≥10	12 (8.1)
Training frequency (days/week)	3–4	12 (8.1)
Training frequency (days/week)	5	41 (27.7)
Training frequency (days/week)	6	85 (57.4)
Training frequency (days/week)	7	10 (6.8)
Training duration (hours/day)	2–3	19 (12.8)
Training duration (hours/day)	4–5	91 (61.5)
Training duration (hours/day)	≥6	38 (25.7)

Characteristic	Category	Total (N = 148), n (%)
Playing specialty	Bowling	105 (70.9)
Playing specialty	Batting	43 (29.1)
Affected leg	Right	60 (40.5)
Affected leg	Left	37 (25.0)
Affected leg	Bilateral	51 (34.5)
Dominant leg	Right	100 (67.6)
Dominant leg	Left	48 (32.4)

MTSS, medial tibial stress syndrome.

Table 2. Clinical assessment findings

Assessment	Side or condition	Classification	Total (N = 148), n (%)
Navicular Drop Test	Right	Normal, 0–5 mm	122 (82.4)
Navicular Drop Test	Right	Mildly excessive, 6–10 mm	26 (17.6)
Navicular Drop Test	Left	Normal, 0–5 mm	128 (86.5)
Navicular Drop Test	Left	Mildly excessive, 6–10 mm	20 (13.5)
Single Leg Stance Test	Right, eyes open	Normal	142 (95.9)
Single Leg Stance Test	Right, eyes open	Impaired	6 (4.1)
Single Leg Stance Test	Right, eyes closed	Normal	28 (18.9)
Single Leg Stance Test	Right, eyes closed	Impaired	120 (81.1)
Single Leg Stance Test	Left, eyes open	Normal	146 (98.6)
Single Leg Stance Test	Left, eyes open	Impaired	2 (1.4)
Single Leg Stance Test	Left, eyes closed	Normal	30 (20.3)
Single Leg Stance Test	Left, eyes closed	Impaired	118 (79.7)
Y-Balance Test	Right	Normal, ≥94%	3 (2.0)
Y-Balance Test	Right	Impaired, <94%	145 (98.0)
Y-Balance Test	Left	Normal, ≥94%	4 (2.7)
Y-Balance Test	Left	Impaired, <94%	144 (97.3)
Joint Position Sense	Both legs	Normal	108 (73.0)
Joint Position Sense	Both legs	Unilateral impairment	18 (12.2)
Joint Position Sense	Both legs	Bilateral impairment	22 (14.9)
Foot Function Index	Overall	Minimal	93 (62.8)
Foot Function Index	Overall	Mild	53 (35.8)
Foot Function Index	Overall	Moderate	2 (1.4)

Table 3. Ankle inversion and eversion strength assessed by manual muscle testing

Side	Movement	Normal, n (%)	Good, n (%)
Right	Inversion	147 (99.3)	1 (0.7)
Right	Eversion	148 (100.0)	0 (0.0)
Left	Inversion	147 (99.3)	1 (0.7)
Left	Eversion	148 (100.0)	0 (0.0)

Table 4. Clinical assessment classifications by MTSS presentation

Assessment	Classification	New-onset MTSS (n = 35), n (%)	Recurring MTSS (n = 113), n (%)
Joint Position Sense	Normal	20 (57.1)	88 (77.9)
Joint Position Sense	Unilateral impairment	3 (8.6)	15 (13.3)
Joint Position Sense	Bilateral impairment	12 (34.3)	10 (8.8)
Right Y-Balance Test	Normal	2 (5.7)	1 (0.9)
Right Y-Balance Test	Impaired	33 (94.3)	112 (99.1)
Left Y-Balance Test	Normal	3 (8.6)	1 (0.9)
Left Y-Balance Test	Impaired	32 (91.4)	112 (99.1)
Foot Function Index	Minimal	18 (51.4)	75 (66.4)
Foot Function Index	Mild	16 (45.7)	37 (32.7)
Foot Function Index	Moderate	1 (2.9)	1 (0.9)

MTSS, medial tibial stress syndrome.

Table 5. Overall associations between MTSS presentation and clinical assessment classifications

Assessment	Exact p-value	Holm-adjusted p-value	Cramér's V
Joint Position Sense	0.002	0.008	0.304
Right Y-Balance Test	0.139	0.279	0.146
Left Y-Balance Test	0.041	0.124	0.201

Assessment	Exact p-value	Holm-adjusted p-value	Cramér's V
Foot Function Index	0.153	0.279	0.142

MTSS, medial tibial stress syndrome. Two-sided Fisher–Freeman–Halton exact tests were used for the 2 × 3 tables and two-sided Fisher's exact tests for the 2 × 2 tables. Exact p-values used probability ordering with fixed margins. Holm adjustment was applied across the four overall comparisons. Cramér's V was calculated from the uncorrected Pearson chi-square statistic. Statistical significance threshold: 0.05.

Table 6. Crude category-specific odds ratios comparing new-onset with recurring MTSS

Assessment	Category contrast	Crude OR	Exact 95% CI
Joint Position Sense	Unilateral impairment versus normal	0.881	0.149–3.562
Joint Position Sense	Bilateral impairment versus normal	5.193	1.782–15.590
Right Y-Balance Test	Impaired versus normal	0.150	0.002–2.961
Left Y-Balance Test	Impaired versus normal	0.097	0.002–1.257
Foot Function Index	Mild versus minimal	1.794	0.762–4.214
Foot Function Index	Moderate versus minimal	4.082	0.050–331.295

MTSS, medial tibial stress syndrome; OR odds ratio; CI, confidence interval. ORs are conditional maximum-likelihood estimates comparing category odds in new-onset versus recurring MTSS. Reference categories are normal for Joint Position Sense and Y-Balance assessments and minimal for Foot Function Index. Confidence intervals are equal-tailed conditional exact intervals without multiplicity adjustment. Estimates are unadjusted for covariates.

DISCUSSION

This study identified an association between MTSS presentation and joint position sense among cricketers, with bilateral proprioceptive impairment more frequent in new-onset than recurring cases. This association remained after adjustment for multiple comparisons. In contrast, the left-leg dynamic balance association did not remain statistically significant after adjustment, and neither right-leg dynamic balance nor foot function showed clear evidence of an association with MTSS presentation. These findings distinguish clinical characteristics within an affected population rather than identify factors associated with developing MTSS.

The joint position sense finding is relevant to the role of proprioceptive information in movement regulation. Sensory input concerning limb position and movement contributes to motor control, providing a plausible basis for examining proprioception in athletes with lower-limb symptoms (7). However, the observed difference does not establish that impaired proprioception preceded MTSS or that recurring symptoms promote proprioceptive recovery. Differences in current pain, symptom duration, activity modification, or previous rehabilitation could plausibly contribute to the group pattern, but these explanations were not evaluated. Furthermore, joint position sense represents one component of proprioception, and performance on a particular assessment should not be interpreted as a comprehensive measure of sensorimotor function. Horváth et al. emphasized the site- and method-specific nature of proprioceptive accuracy, supporting cautious interpretation of categorical joint position sense findings (8).

The greater frequency of bilateral impairment in new-onset cases also requires consideration of the distinction between episode history and current clinical severity. A first episode is not necessarily less symptomatic than a recurring episode, while recurrence history does not establish persistent functional impairment. Research examining running biomechanics in athletes with a history of MTSS provides a related context for investigating movement characteristics after previous symptoms, but it addresses a different comparison from the present study (3). Consequently, the current findings should not be interpreted as evidence that proprioceptive impairment increases with repeated episodes. They instead suggest that episode classification and sensorimotor findings may be related in ways that require more detailed assessment of symptom history and current presentation.

Dynamic balance findings were less conclusive. Almost all participants fell below the selected Y-Balance threshold, leaving very few observations in the normal category. This restricted distribution reduced the precision of category-specific estimates and made the apparent left-leg association sensitive to the analytical approach. Its loss of statistical significance after multiplicity adjustment further limits confidence in a side-specific finding. Plisky et al. highlighted the importance of population characteristics and testing procedures when interpreting Y-Balance performance, indicating that a threshold should not automatically be treated as a universal marker of

clinical impairment (10). The high frequency of below-threshold scores in this sample may reflect functional difficulty, threshold applicability, assessment procedures, or a combination of these factors.

Previous balance research provides partial contextual support without directly confirming the present association. Kishi et al. examined single-leg drop-jump landing in junior female athletes with shin splints, using an assessment that differs from the Y-Balance Test in its movement demands and outcome measurement (11). Differences in sex distribution, sporting exposure, task requirements, and limb classification therefore limit direct comparison. In the present study, right- and left-leg analyses also combined participants with unilateral and bilateral symptoms. Without jointly accounting for affected side and dominance, the findings do not establish a distinct left-sided mechanism. Similarly, the contrast between largely normal eyes-open stance and frequent eyes-closed impairment suggests that performance depended on testing conditions, but does not isolate a particular sensory deficit. Evidence concerning single-leg stance reliability is protocol-specific, including whether a stability platform is used (13).

Foot Function Index classification was not clearly associated with MTSS presentation. This result does not establish equivalent foot function between new-onset and recurring cases. Most participants occupied the minimal or mild categories, while only two had moderate dysfunction, producing considerable uncertainty in the corresponding estimate. Patient-reported foot function and performance-based balance also assess different constructs, so a high frequency of below-threshold balance performance can coexist with relatively limited reported foot disability. The measurement-property review by Cervera-Garvi et al. provides support for examining the Foot Function Index as a distinct patient-reported outcome, rather than treating it as interchangeable with biomechanical or balance assessments (9). Categorizing its scores may additionally obscure differences within categories.

Normal navicular drop and manual muscle testing findings should likewise be interpreted within the limits of their respective measurements. Foot muscle activity contributes to locomotor function beyond passive arch support, and a static measure of arch mobility does not capture all aspects of foot behaviour during sporting tasks (5). Yüksel et al. investigated inversion–eversion strength using isokinetic testing, whereas the present study used manual muscle grades (6). These approaches differ in their ability to quantify strength and relative muscle performance. The near-uniform manual muscle testing distribution may therefore reflect limited discrimination at the upper end of the scale. It cannot establish that normal strength protected participants from MTSS, particularly because all participants already had the condition. More broadly, the multifactorial framework described in MTSS reviews cautions against attributing the clinical presentation to any single assessment finding (1,2,4).

The clinical contribution of this study is the identification of potentially different proprioceptive profiles among affected cricketers. The findings support further investigation of joint position sense alongside symptom history and functional assessment, but do not establish a screening rule, treatment indication, or recurrence prediction tool. Neuromuscular training has been investigated in youth female track-and-field athletes, providing a relevant intervention context; however, those findings cannot demonstrate that treating the deficits observed here would improve outcomes in cricketers (12). At a club or academy level, the present results offer descriptive information about symptomatic players rather than an estimate of MTSS prevalence or evidence for a population-wide prevention programme.

Strengths include the cricket-specific population, assessment of several complementary clinical domains, and separate reporting of right- and left-leg findings. Reanalysis using exact tests addressed sparse categorical comparisons, while confidence intervals and multiplicity adjustment provided a more cautious assessment of the associations. Nevertheless, the cross-sectional design prevents determination of temporal sequence, and the absence of an unaffected comparison group precludes inference about MTSS occurrence. Convenience sampling from one city and the predominantly male sample limit generalizability. The unequal group sizes, sparse outcome categories, and lack of covariate adjustment further restrict interpretation. Age, training exposure, symptom duration, previous rehabilitation, affected side, and dominance could contribute to the observed associations.

Additional limitations concern reproducibility and classification. The operational distinction between new-onset and recurring MTSS requires clearer specification, as do several assessment procedures and category thresholds. The discrepancy between the stated age eligibility criteria and the reported age categories also requires resolution. Continuous assessment scores would permit a more informative examination of variability than categorical summaries alone. Although the joint position sense association remained after multiplicity adjustment, it should

therefore be regarded as an exploratory association requiring confirmation in studies with clearly defined episode histories, standardized measurements, and longitudinal assessment.

CONCLUSION

Joint position sense classification was associated with new-onset versus recurring MTSS among cricketers, with bilateral impairment more frequent in new-onset cases. This association remained after adjustment for multiple comparisons, whereas the left-leg dynamic balance association did not; right-leg dynamic balance and foot function showed no clear associations with MTSS presentation. These findings identify proprioception as a potentially relevant component of the clinical profile of affected cricketers, without establishing its role in MTSS development or recurrence.

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