

Prevalence of Medial Tibial Stress Syndrome Among NCC Cadets

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Abstract: The terms "shin pain," "shin splints," and "Medial Tibial Stress Syndrome" (MTSS) are commonly used to refer to pain and discomfort in the lower leg. It might impact recreational and competitive athletes equally, particularly distance runners, endurance sports players, dancers, and the military, proving that this injury is strongly linked to higher physical demands (overload). Medial Tibial Stress Syndrome (MTSS) is a common overuse injury of the lower extremity. It typically occurs in runners and other athletes that are exposed to intensive weight-bearing activities such as jumpers, most common injuries sustained by military personnel, associated with MTSS impact from loading activities such as marching.

The Aim and objective: The purpose of study is to treat and prevent the shin pain of NCC cadets due to stroking of foot..

Need of study – To investigate the NCC cadets who suffer with shin pain due to forceful marching, this investigation will help to make beneficial treatment plan.

Methodology- Under this thesis, we took 72 NCC Cadet (girls) and SD's (boys) as subjects and required them to complete up a Google form with the cadets' consent. Out of 72 cadets, 36 filled "yes" and 36 said "no" to shin pain. The agree cadets were summoned for confirmation testing, during which tests were administered using the 'Shin Pain Scoring Scale'. After the test, four cadets were eliminated. Hence, 32 cadets met the inclusion criteria, while 40 Cadets fell in the exclusion criteria.

Outcome measures -Scales to be used in this study are VAS & SPSS.

Results- Moderate grade shin pain occur among NCC cadets in both leg.

Conclusion- we conclude that moderate-grade pain occurs in NCC cadets.

Key Words- Shin pain, MTSS, SPSS, NCC

I. INTRODUCTION

The terms "shin pain," "shin splints," and "Medial Tibial Stress Syndrome" (MTSS) are commonly used to refer to pain and discomfort in the lower leg. It might impact recreational and competitive athletes equally, particularly distance runners, endurance sports players, dancers, and the military, proving that this injury is strongly linked to higher physical demands (overload).^(1, 2)

Tibia's main purpose is to bear the weight of the body when it is standing, walking, or jogging. It is a crucial element of the kinetic chain since it aids in the transmission of forces between the legs and the upper body, and vice versa.² Medial Tibial Stress Syndrome (MTSS) is a frequent overuse injury of the lower extremity that is commonly seen in runners and other athletes who engage in high intensity weight-bearing exercises such as jumpers. It manifests as exercise-induced discomfort over the anterior tibia and is a stress fracture in the early stages of the tibial stress fracture continuum.⁷ MTSS is a common injury experienced by military troops, with the reported incidence rate ranging from 7.9% to 35.1.² It can put people at risk from a significant rise in workload, volume, and high-impact exercise. Although pain from MTSS is often brought on by lower limb impact from loading activities like running, walking, and marching.⁸

The growth of MTSS is multifactorial, including both internal and external variables. Intrinsic variables include anatomical and biomechanical abnormalities such as over pronation of the foot, increased external rotation of the hip, and a higher body mass index (BMI).⁹

Training mistakes, such as abrupt increases in training intensity or duration, poor footwear, and running on hard or uneven surfaces, are examples of external variables. According to a systematic review, risk factors for MTSS include female gender, a prior history of MTSS, and an increased navicular drop, which suggests excessive foot Pronation.^{9,10}

People with MTSS often experience widespread pain in the middle to distal third of the posteromedial tibia. The agony is frequently characterized as a low ache that gets worse when you exercise and better when you rest. During a physical examination, the affected area is tender to the touch, and sometimes there may be minor swelling.¹⁰ One of the most important components of the physical exam is palpation. The main symptom of medial tibial stress syndrome, often referred to as “shin splints,” is pain that is localized to the medial border of the tibia’s lower third. The triggering action is removed by relative rest.¹¹

Intense training programs for NCC cadets include extended marching, running, and drill practice. The repetitive stress impact on the lower extremities brought about by these activities on hard training surfaces makes the stress on the tibia worse, which increases the likelihood of experiencing the typical signs of MTSS.¹²

A study that looked at military cadets found that the incidence of MTSS is particularly high in this group, with variables like abrupt changes in training intensity, insufficient rest breaks, and inappropriate footwear contributing to the start of the illness.

II. STATEMENT OF THE PROBLEM

A study to assess, treat and prevent the MTSS of NCC cadets due to the stroking of the foot against the floor with suitable physical exercises.

Objectives

The purpose of this study is to investigate MTSS in NCC cadets who suffer from shin pain, and that investigation will help create a beneficial treatment plan.

HYPOTHESIS

Impact on the shin bone by forcefully striking against the ground will make almost 50% participants suffer from MTSS.

III. METHODOLOGY

Each participant taken from 14 Raj NCC BN (ARMY) and 7 Raj Air Squadron, Kota and we sent google form his/her and make sure that the participants fall under inclusion criteria.

Inclusion Criteria

- Active NCC Cadets:
- Typically, College going cadets between 17 to 22 years old.
- History of Shin Pain
- Cadets with at least 3 months of continuous physical training experience.

Exclusion criteria

- Acute Injuries: recent fractures, sprains, or other acute injuries of the leg.
- Pre-existing Medical Conditions: severe flat feet, arthritis, or previous surgeries.
- Neurological Disorders: Cadets with conditions like neuropathy or other neurological issues affecting gait or leg movement.
- Long term Medication Usage: corticosteroids) that could impact bone density or muscle function.
- Previous Shin Surgery

INSTRUMENTATION FOR DATA COLLECTION

- Measuring tape
- Tuning fork
- Ruler/scale
- Shin pain scoring System, Measuring tape

Under this work, we took 72 army and air wing SWs (girls) and SDs (boys) as subjects and required them to complete up a Google form questionnaire with the cadets' consent.

Out of 72 cadets, 36 filled "yes" for shin pain on the form. Out of 72 subjects, 36 said "no" to shin pain. The agree cadets were summoned to the parade ground for confirmation testing (loaded dorsiflexion, fulcrum test, tap test, tuning fork test, single leg hop test), during which tests or tasks were administered using the 'Shin Pain Scoring Scale', which conclude our inclusion criteria.

Outcome measures:

- a) Visual Analogue Scale (add in Google form)

The score is calculated with a ruler by measuring the distance (mm) on the 10-cm line from the "no pain" anchor to the patient's mark, resulting in scores ranging from 0 to 100. 13

- b) Shin Pain Scoring System (SPSS):

While there isn't a universally recognized single scoring system, several assessment tools and scales are commonly used in research and clinical practice to evaluate shin pain severity, functional limitations, and recovery progress. ¹⁴ shin pain scoring system with a total score of 29 would typically be divided into mild, moderate, and severe pain:

- Mild Pain → 0–9
- Moderate Pain → 10–19
- Severe Pain → 20–29

Hence, 32 cadets met the inclusion criteria, while 40 Cadets fell in the exclusion criteria, for further data analysis and observational study, shin pain scoring scale (having some confirmation task; Loaded Dorsiflexion, tap test, fulcrum test, tuning fork test, single leg hop test) for observation of MTSS) is used which will give exact result.

After all these tests by 32 cadets, I found separate readings of Right and Left Leg Tibia of 32 cadets according to SPSS Interpretation (Total Score 29), which I have mentioned in the SPSS format (reading of all confirmation tests), in which the pain location of each cadet is also mentioned.

Right and left tibia of 32 cadets together have total 64 tibia (64 tibia total; R-32, L-32) and number of 20 years old cadets is high in MTSS according to this study.



Fig: Loaded Dorsiflexion



Fulcrum Test



Single Hop test

Table 6.1: Distribution of cadets as per age-

No. of cadet	Age
7	18
6	19
8	20
6	21
5	22

IV. DATA ANALYSIS

The data was coded and entered into Microsoft Excel Spreadsheet. Analysis was done using Microsoft Excel. Descriptive statistics included mean, Median and standard deviation.

V. RESULT

Result shows shin pain as how much pain is there in which tibia per cadet {32 cadets: 64 tibia (right and left leg). Shin pain scoring scale (SPSS – total 29 score) was distributed as 0-9(mild), 10- 19(moderate) and 20-29(severe category) according to the interpretation.

In this data of SD (boys) and SW(girls) in which the total number of right and left tibia is 32 after category distribution (64 tibia total; R-32, L-32).

We found the result that higher grade is show; **78.125%** moderate scoring in left leg tibia of cadets and then **75%** moderate scoring in right leg tibia.

In current study, Prevalence of medial tibial stress syndrome (MTSS) among NCC cadets, Cadets have 44.44%, cadet comes under inclusion criteria from a total 72 obtained cadets at Career Point University, kota.

Table: Shin Pain grading

No. of Tibia (64)	Mild (0-9)	Moderate (10-19)	Severe (20-29)
Right (Total- 32)	3 (9.375%)	24 (75%)	5 (15.625%)
Left (Total- 32)	4 (12.5%)	25 (78.125%)	3 (9.375%)

VI. DISCUSSION

In current study, Prevalence of medial tibial stress syndrome (MTSS) among NCC cadets, Cadets have **moderate** amount of pain in both right and left leg tibia, out of 32 cadets, **24 (75%) in Right leg and 25 (78.125%) in left leg** shin pain suffering cadets are obtained through the Shin pain scoring system interpretation, the moderate-grade shin pain observed among NCC cadets in your study is consistent with global findings on MTSS prevalence in military settings. Implementing preventive strategies, such as tailored training programs and early intervention techniques, could be instrumental in mitigating the impact of MTSS among cadets.

3 (9.375%) in mild and 5 (15.625%) in severe category in the Right leg and 4 (12.5%) in mild and 3 (9.375%) in severe category left leg shin pain data collected by the use of SPSS.

The occurrence of medial tibial stress syndrome (MTSS) is significantly elevated among military personnel, including National Cadet Corps (NCC) cadets. This condition results from the intense physical requirements and repetitive strain linked to military training.

Numerous military injury monitoring studies have not specifically identified MTSS, instead categorizing them within general overuse injuries.

This shows a mixed attitude: MTSS is recognized but not consistently prioritized unless it interferes with training. As a result, even though MTSS is acknowledged, it rarely leads to significant disruptions, though it does impose considerable physical stress that requires timely management.¹⁵

Many studies highlight the common occurrence of MTSS among military personnel, but it is important to note that the rate of this condition can differ due to factors like training intensity, personal biomechanics, and implemented preventive strategies.¹⁵

VII. CONCLUSION

In this study, we conclude that moderate-grade shin pain was observed among NCC cadets and our study is consistent with global findings on MTSS prevalence in military settings.

VIII. REFERENCES

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