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Prevalence Of Tibial Stress Syndrome In Recreational Bowlers Using Shin Palpation Test

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ABSTRACT:

Background: Medial Tibial Stress Syndrome (TSS), commonly known as shin splints, is a frequent overuse injury affecting the lower extremities, particularly among athletes and individuals engaged in repetitive weight bearing activities. Bowling, though perceived as a low-impact sport, involves repetitive biomechanical stresses that may predispose recreational bowlers to tibial stress injury. Because of all these factors can cause TSS in future, So Prevent future impairments Proper diagnosis is important. The Shin Palpation Test (SPT) is a simple and reliable clinical tool for identifying TSS.

Methodology: This observational study includes 58 recreational bowlers aged 18–30 years, selected through convenience sampling. Participants with a minimum of 2 years of playing experience will be screened according to inclusion and exclusion criteria. After obtaining informed consent, demographic data will be recorded, and the Shin Palpation Test will be administered bilaterally. Any report of pain during palpation will be noted as a positive finding.

Result: Data will be analysed to calculate the prevalence of TSS among recreational bowlers. The findings will be presented in terms of prevalence rate and distribution according to demographic and pain intensity.

Conclusion: The study is expected to provide evidence regarding the prevalence of Tibial Stress Syndrome in recreational bowlers. The study concluded that 88% shows the prevalence of Tibial Stress Syndrome in recreational bowlers. Findings may help increase awareness of injury risks in non-professional sports participants and guide preventive and management strategies.

Keywords: Tibial Stress Syndrome, Shin Splints, Recreational Bowlers, Shin Palpation Test

INTRODUCTION

Medial tibial stress syndrome (TSS), commonly known as shin splints, is an inflammation of the muscles, tendons, and bone tissue surrounding the tibia. This condition is characterised by pain along the inner edge of the shin bone, often resulting from repetitive stress and overuse.[1] Medial tibial stress syndrome [TSS] is one of the most common lower extremity overuse sports injuries, with an incidence of 4%-19% in athletes and 4%-35% in the military population.[2] Several theories have been advanced to explain the occurrence of medial tibial stress syndrome periostitis. Including muscle on fascial traction on the periosteum. Or both, and tibial bending with weight bearing. There has been much conjecture regarding the structures, particularly the muscles, that contribute to traction-induced medial tibial stress syndrome. The muscles that have been implicated are the tibialis posterior, soleus, and the flexor digitorum longus". Some studies have also suggested that the deep crural fascia, which attaches along the length of the medial border of the tibia, may produce a traction stress at the site of the symptoms of medial tibial stress syndrome when the posterior compartments become tight with exercise. [4] A more descriptive term that explains the inflammatory traction event in the tibial aspect of the common leg in runners is the medial periostitis of the tibial traction, or simply the tibial periostitis medial. As the soleus muscle fibres insert 4 inches proximal to the medial malleolus, and the tibialis posterior origin is 7.7 cm proximal to the medial malleolus, it participates in the traction theory and hence causes TSS pain. Pronation of the foot is one of the clinical features used for the diagnosis of TSS. Pronation of the foot is one of the clinical features used for the diagnosis of TSS.[2] Running kinematics, in both stance and swing phases, are strongly related to the development of TSS, and all the joints in the lower limbs can contribute to the emergence of this pathology. Overpronation of the foot seems to be related to its development, since it has been associated with several biomechanical findings present in TSS runners [5] In the shin palpation test (SPT), Palpation of the distal two-thirds of the posteromedial lower leg, including the posteromedial border of the tibiae and associated musculature, is performed bilaterally. Their fingers are in palpation with enough pressure to squeeze out a wet sponge. [6] Cricket is the most popular sport in India (9). The major global team sport of cricket has both a high rate of gradual onset of various injuries and significant variations in players' workloads. Whereas most team sports are played over a short and specific duration, cricket is played in a variety of forms (8). Three unique aspects of the game are bowling, batting, and fielding, which are associated with risk of injury [9] The first description of medial tibial stress syndrome (TSS) was in 1958. Devas1 published the first study and described signs and symptoms of what he termed a stress fracture at the tibia or shin soreness. Yates and White6 most accurately described TSS as "pain along the posteromedial border of the tibia that occurs during exercise, excluding pain from ischemic origin or signs of stress fracture. Musculoskeletal pain occurs while playing cricket: A player struck by a ball or bat, rapid rotational movement, sliding and diving, collisions with other players (7). Recreational sports refer to activities that primarily serve to enhance physical fitness, compensate for physical inactivity, and provide enjoyment through sports. Recreation bowlers are players who play for their amusement, happiness, fun, as a hobby, and for pleasure.[8]

ETHICAL STATEMENT

The study received approval from the Institutional Ethics Committee. It was conducted following the ethical guidelines of the Declaration of Helsinki (updated 2013) for medical research involving human subjects, as well as the 2017 National Ethical Guidelines for Biomedical and Health Research involving Human Participants from the Indian Council of Medical Research.

DESIGN

A total of 58 sample were selected on the basis of inclusion criteria who were recrectional bowlers. Subject were assessed for Palpation of the distal two-thirds of the posteromedial lower leg. The result of test were collected and analysed to find out prevalence of Tibial Stress Syndrome in recreational bowlers

PARTICIPANTS

Total 58 participants were chosen on the basis of inclusion criteria of the study. The inclusion criteria of study included tibial stress pain. The analysis of study was done by using MS excel sheet. Person Correlation was used to find prevalence of Tibial Stress Syndrome in recreational bowlers

OUTCOME MEASURE

1. NPRS SCALE

PROCEDURE

Ethical committee approval was obtained from the institutional ethical committee for the study. A total of 58 subjects will be screened according to the inclusion and exclusion criteria. Informed consent forms were provided to the subject in a language they understand. Written consent was obtained from the subject. The procedure was explained to the them. At the start of the study, demographic data were collected, and a shin palpation test Was formed

Visual Analogue Scale

The VAS is a straight horizontal line, usually 10 cm long, anchored by two descriptors at each end. Left end (0): "No pain" or "No symptom"

Right end (10): "Worst imaginable pain" or "Most severe symptom"

DATA ANALYSIS

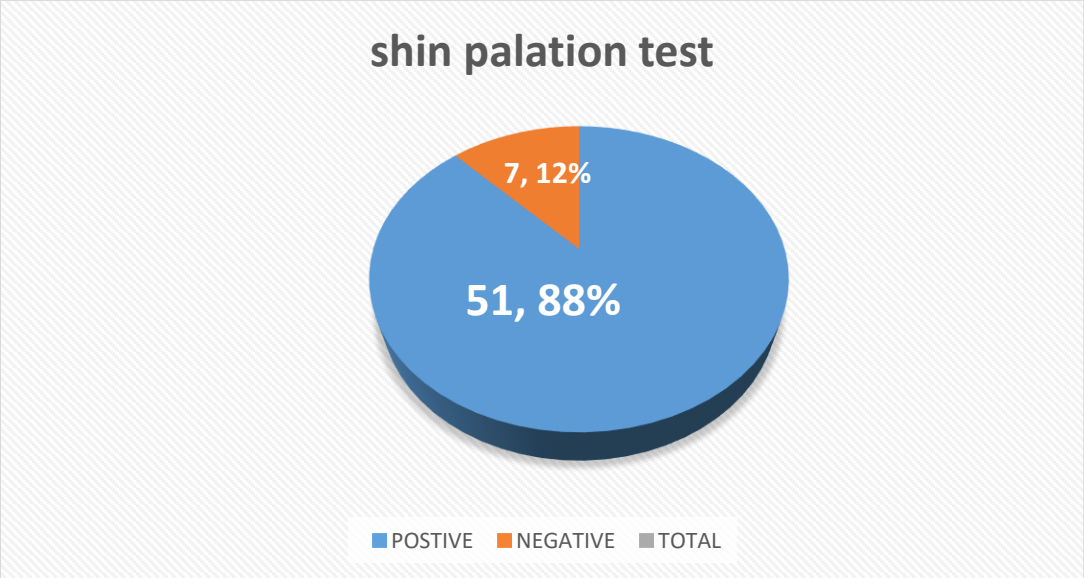
The data is collected and analysed using descriptive statistics using percentage in MS Excel sheet\

RESULT

Prevalence of tibial stress syndrome in recreational bowlers using the shin palpation test

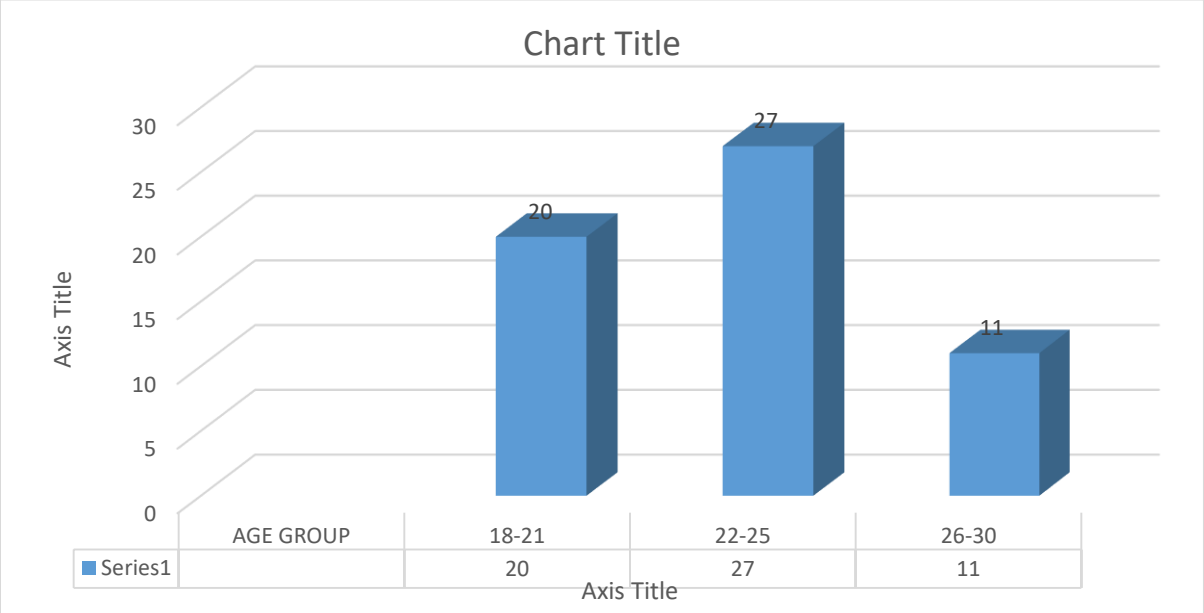
SHIN PALPATION TEST	frequency	percentage
PRESENT	51	88%
ABSENT	7	12%

Table no.1: shows percentage of present & absent value for shin palpation test. (88% is showing present result & 12 % was showing absent result for shin palpation test)



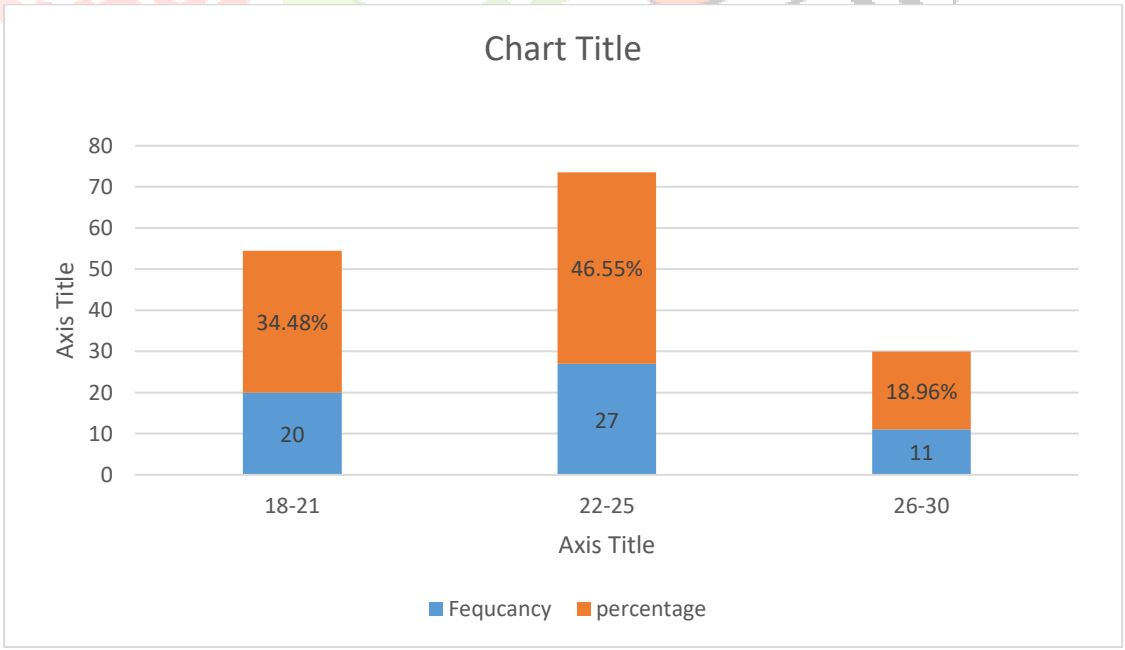
AGE	FREQUENCY
18-21	20
22-25	27
26-30	11

Table no 2: shows the age distribution of frequency and percentage among recreational bowlers



Graph 2: shows the age group of Recreational bowlers

Interpretation: data shows that participation peaks among individuals aged 22–25, gradually decreases in the older age groups, and is lowest among those aged 26–30. This trend could suggest that the study or activity appeals more to younger adults, particularly those in their early twenties.



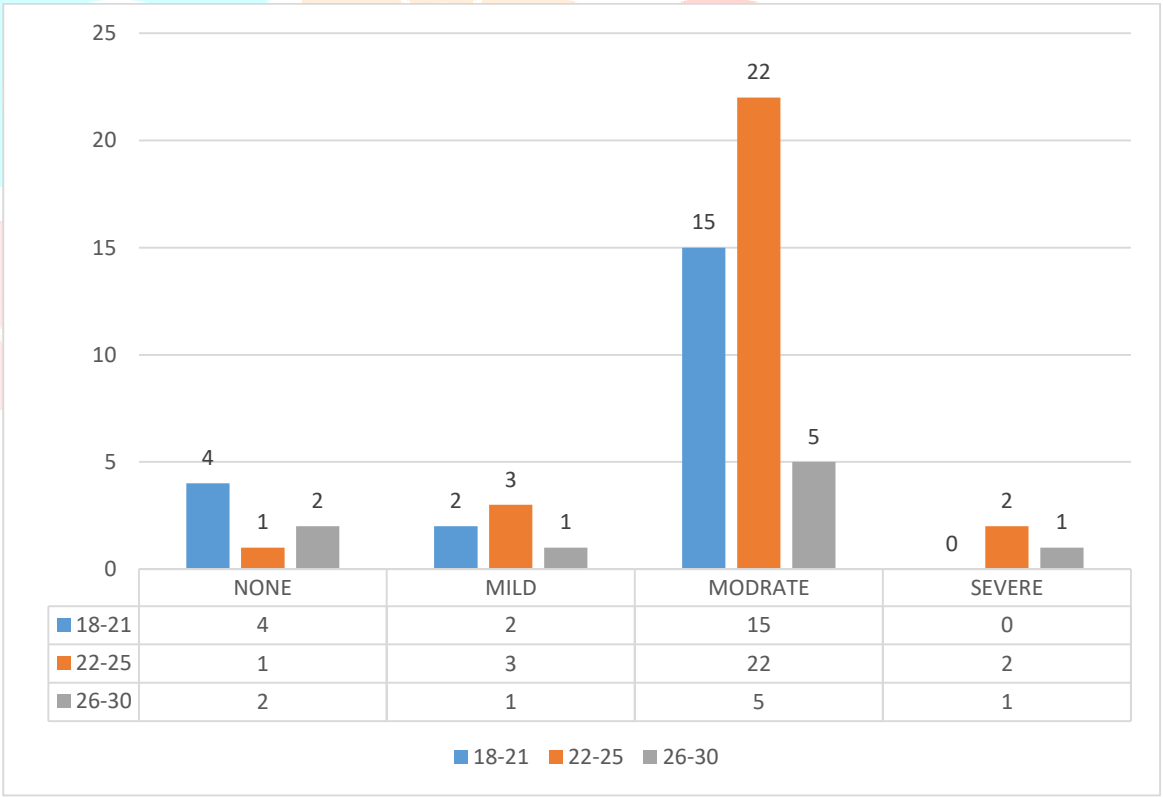
Graph no. 3: shows the age distribution of the percentage among recreational bowlers

Interpretation: that participation is highest among individuals aged 22–25, moderate among those aged 18–21, and lowest among the 26–30 age group. This suggests that the study or activity primarily attracted younger adults, especially those in their early twenties.

AGE	Fequcancy	percentage
18-21	20	34.48
22-25	27	46.55
26-30	11	18.96

Table no 3: presents the age-wise distribution of participants based on their frequency and percentage.

AGE	NONE	MILD	MODRATE	Severe
18-21	4	2	16	0
22-25	1	3	22	2
26-30	2	1	5	1



Graph no & table no 3: show the correlation between age group and NPRS

Interpretation: This pattern suggests that individuals in the 22–25 age range are more likely to experience moderate intensity of the measured condition compared to younger or older participants.

DISCUSSION

The present study aimed to identify the prevalence of Tibial Stress Syndrome (TSS) in recreational bowlers using the Shin Palpation Test (SPT) and to assess the severity of pain using the Numeric Pain Rating Scale (NPRS) The study shows an 88% prevalence of tibial stress syndrome using the Shin Palpation Test in bowlers. In a recent study among 58 participants, 51 had TSS present, and 7 had it absent. TSS is a frequently diagnosed lower limb condition, especially in runners, as injury occurs due to monotonous repetitive actions as well as overuse. Repetitive actions or overuse lead to tearing away of muscle fibres at the muscle-bone interface, which causes inflammation at the periosteum. Periosteum is a layer that surrounds the surfaces of your bone; it is a membranous tissue. TSS presents inflammation of the periosteum [Periostitis] at the posterior medial border of the distal tibia. The distribution emphasises that moderate severity is predominant across all age groups, with a notable concentration in the 22–25 years cohort. Severe cases, though uncommon, appear more frequently in the older age ranges. These findings suggest that interventions and preventive measures may need to focus particularly on individuals in their early to mid-20s to mitigate progression from moderate to severe levels. Tricia J. Hubbard, et al. in 2008 did prospective investigation on Contributing factors to Medial Tibial Stress Syndrome with purpose of conducting a prospective, multisite, cohort study investigating the possible risk factors for medial tibial stress syndrome (TSS) in college athletes; where 29 out of 146 samples developed TSS This study concluded that the factors most influencing 21 TSS development were previous history of TSS and stress fracture, years of running experience, and orthotic use. They also demonstrated the importance of establishing a thorough history before the start of the season so that athletes who might be at risk for TSS development can be identified. One important observation from this study is that recreational bowlers may underestimate the physical demands of the sport, often engaging in prolonged play without adequate warm-up, footwear, or strength training. This aligns with findings from Orchard et al. (2015) and Sathya & Parekh (2017), who reported that cricket players, especially bowlers, are at risk of musculoskeletal injuries due to repetitive stress, poor load management, and lack of preventive strategies. Jason E. Bennett, et al., conducted a study in 2001 with the objectives of identifying the incidence of TSS in a group of high school cross-country runners and determining if any relationship exists between lower extremity structural measures and the incidence of TSS. They measured tibiofibular varum, resting calcaneal position, gastrocnemius length, and navicular drop. Their study supported the hypothesis that pronator foot type is related to TSS. Soleus muscle fibres insert 4 cm proximal to the medial malleolus, and the Tibialis posterior muscle originates 7.7 cm proximal to the medial malleolus [16] Both the soleus and tibialis posterior muscles contribute highly to running. While walking, the whole body's weight is alternately supported by each foot and leg. But, when one starts walking faster or running, lower extremity muscles contract with much more force to pitch the body weight [14]. These added forces on the muscular components or their overuse lead to tearing away of muscle fibres at the muscle-bone interface, and hence cause periostitis. It also contributes to the reduced strength of these muscles. Thereby connecting the reduced strength of the soleus and tibialis posterior muscle to TSS. Saxena et al performed a study to investigate the involvement of 22 the Tibialis posterior muscle, where they observed tibialis posterior muscle arises from the distal third of the tibia and hence is a contributor to TSS. Newman et al. (2012) demonstrated its reliability and predictive value in identifying individuals at risk of developing TSS. In our study population, the presence of pain upon palpation of the distal two-thirds of the tibia was used as a diagnostic marker, ensuring a simple yet clinically relevant screening approach. This is particularly valuable in settings where advanced diagnostic tools such as MRI or bone scans are not feasible. P. Sathya et al (2017). Bowling involves repetitive twisting, extension, and rotation of the trunk in a short period; at the same time, body tissues and footwear must absorb large ground reaction forces of 4.1 to 9 times the bowler's body weight. And lower limb injuries to the knees and ankles are common due to the heavy impact and

twisting forces while running before the bowling action. Shoulder injuries in Bowlers tend to result from throwing, but can be aggravated by bowling because of the repetitive forces involved. Because of all these factors, individuals are more prone to experiencing pain during bowling. Overall, the data reveals a peak in positivity during the formative years, followed by a relative decline, highlighting the need for targeted support in later career phases to sustain engagement and mitigate dissatisfaction. The prevalence identified in this study further emphasises the need for preventive measures, such as strengthening the calf and tibialis posterior muscles, correcting foot biomechanics (e.g., excessive pronation), using shock-absorbing insoles, and educating individuals about load management. Early screening using the SPT can also help in the timely identification and management of potential injuries before they progress to stress fractures. 23 During this study, it was also observed that participants did not have enough knowledge about TSS. They had misunderstood their condition for regular soreness. Such an opinion of them could potentially worsen their situation. Hence, earlier detection of TSS would prevent further progression of TSS. Above mentioned factors could be potential contributors to such a high percentage of prevalence of TSS in recreational bowlers.

CONCLUSION

The study is expected to provide evidence regarding the prevalence of Tibial Stress Syndrome in recreational bowlers. The study concluded that 88% shows the prevalence of Tibial Stress Syndrome in recreational bowlers. Findings may help increase awareness of injury risks in non-professional sports participants and guide preventive and management strategies.

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