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Medial Tibial Stress Syndrome: Reliably Diagnosed using History and Clinical Examination?

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PURPOSE: In sports medicine the majority of overuse injuries are diagnosed using clinical examination as the cornerstone. Whether this can be done reliably has hardly ever been investigated. Medial tibial stress syndrome (MTSS) is a common lower limb overuse injury which is defined as: exercise-induced pain along the posteromedial tibial border, and provocation of recognisable pain on palpation ≥ 5cm of the posteromedial tibial border. This diagnosis does not involve costly additional imaging. Our aim was to assess if MTSS can be diagnosed reliably, using history and clinical examination.
METHODS: In this cross-sectional study all athletes with lower leg pain presenting to a sports physical therapy centre were assessed by 2 physical therapist assessors, chosen from a pool of 5 and blinded to each others' diagnoses, for having MTSS (yes/no). We calculated the prevalence, percentage of agreement, the observed percentage of positive agreement (Ppos), the observed percentage of negative agreement (Pneg), and the chance-corrected ratio of agreement, the Kappa-statistic with 95% confidence interval (CI). We calculated the bias - and prevalence index (BI and PI) to assess their possible effect on the kappa-statistic.
RESULTS: Fifty-one subjects participate in this prospective reliability cross-sectional study. Preliminary analysis of 32 athletes with lower leg pain showed the prevalence of MTSS to be 73.4%. The number of females was 22 (68.8%) and the mean age (years ±SD) was 20.8±2.0. The percentage of agreement was 97%. The Ppos and Pneg were 98% and 94% respectively. The chance-corrected ratio for agreement, the kappa-statistic was almost perfect; k = 0.92 (95% CI 0.77-1.00). The bias index did not affect the Kappa-statistic, BI = -0.03, whereas the high prevalence may have deflated Kappa, PI = 0.47.
CONCLUSION: MTSS can be reliably diagnosed in athletic populations with exercise-induced lower leg pain, using history and clinical examination.

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Collegiate Cross Country Athlete Lower Extremity Stress Fracture Risk Factors

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Atypical lower extremity (LE) kinematics, ranges of motion (ROM), and body composition increase LE stress fracture risk. It is unknown which variables differ between collegiate cross country athletes who go on to sustain a stress fracture (SFx) and those who do not (NSFx).
PURPOSE: To determine kinematic, ROM, and body composition differences between SFx and NSFx groups.
METHODS: Overhead squat (OHS) errors, passive ROMs, and demographic data were assessed bilaterally in 37 NCAA Division I cross country athletes (m=20, f=17). Medical staff recorded LE stress fractures for one year following testing. OHS errors included: feet flattening/turning out, heel lift, knee valgus/varus motion, lateral weight shift, low back arching/rounding, and arms falling forward. ROM measurements included: great toe extension, ankle dorsiflexion, knee extension, and hip internal/external rotation, abduction, and extension. Body mass index (BMI) was calculated for each athlete. OHS total and specific errors, ROMs, and BMI group differences were assessed via independent samples t-test and chi-square analyses ($\alpha \leq 0.05$).
RESULTS: Nine athletes (24.3%; m=2, f=7) sustained a LE stress fracture. Females were at greater stress fracture risk than males (x^2 (1, N=37)=4.85, P=0.03; SFx=77% female, NSFx=35.7% female). The SFx group had less hip external rotation ROM (SFx: 42.6±6.9, NSFx: 52.3±7.8; t_{35}=3.33, p<0.01) and greater knee extension ROM side-to-side percent differences (SFx: 11.7±6.9, NSFx: 6.8±5.4; t_{35}=-2.21, p=0.03) than the NSFx group. The SFx group also had smaller BMI (SFx: 19.9±0.7, NSFx: 21.6±2.3; t_{35}=2.20, p=0.03). No other differences were observed.
CONCLUSION: Visual observation of the OHS was unable to discriminate between the SFx and NSFx groups. Kinematic differences are reported between similar groups during landings. The OHS may not sufficiently load the LE and thus movement errors are not as pronounced as they are during landings. Hip musculature can alter distal kinematics and increase injury risk; thus, normal and symmetrical hip ROMs may be protective against stress fractures. Our ROM and BMI group differences support previously identified LE stress fracture risks. These findings aid clinicians in identifying runners at greater LE stress fracture risk so injury prevention strategies can be implemented.

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Does Ecg Predict Cardiac Hypertrophy In American-style Football Athletes?

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The accurate and cost effective identification of left ventricular (LV) hypertrophy is clinically relevant due to its association with cardiac mortality in the general population.
PURPOSE: To determine if electrocardiographic (ECG) voltage criteria predicts LV mass measured with cardiac ultrasound in collegiate American-style football (ASF) players.
METHODS: Over a 3-year period, standard resting, supine 12-lead ECG and echocardiographic (ECHO) procedures were performed on 76 collegiate ASF players first entering an NCAA Football Bowl Subdivision university as part of their preparticipation physical exams. Player demographics were: age=18±1 yr., height=186±7 cm, weight=100.1±22.0 kg, BMI=28.6±5.0 kg·m^2, and BSA=2.24±0.25 m^2 . Linear regression was used to predict ECHO-derived LV mass and LV mass/BSA index from ECG precordial-lead voltage criteria [sum largest S (V1 or V2) + R (V5 or V6) ≥ 35 mm].
RESULTS: ECG voltage criteria did not significantly ($p > 0.05$) predict ECHO LV mass (LV mass = -0.12x + 216.94, r = 0.024, R^2 = 0.0006), or LV mass/BSA index (LV mass/BSA = 0.3063x + 81.951, r = 0.17, R^2 = 0.0244).
CONCLUSION: ECG precordial lead voltage was not clinically useful in diagnosing ECHO-derived LV hypertrophy in our sample of first-year collegiate ASF players. We suggest that new and more accurate algorithms for evaluating LV hypertrophy in ASF athletes be explored, possibly using demographic, body habitus, cardiovascular, and other ECG criteria.