



Comparison of Electromyographic Activity Patterns of Gluteus Maximus, Biceps Femoris, and Tensor Fasciae Latae During Treadmill Walking in Individuals with Piriformis Syndrome

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E d i t o r	R e v i e w e r s
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1. Round 1

1.1 Reviewer 1

Reviewer:

In the Introduction, the sentence “Prevalence estimates range from 0.3% to 6% among patients with sciatica, with women affected more frequently than men” creates a mismatch with the study sample, which includes only male participants. The authors should explain why only men were recruited despite the reported higher prevalence in women, and this rationale should appear before the Methods rather than only as a limitation.

In the Introduction, the paragraph discussing the gluteus maximus, biceps femoris, and tensor fasciae latae should better justify why these three muscles were selected while the piriformis itself was not recorded. Since the study concerns piriformis syndrome, readers will expect either direct piriformis EMG, an explanation of why surface EMG was unsuitable for piriformis assessment, or a stronger theoretical rationale for using these muscles as indirect indicators of altered lumbopelvic neuromuscular control.

In the Study Design paragraph, the sentence “This study employed a case-control design...” should be expanded to clarify whether the study was prospective or retrospective, whether group matching was planned a priori, and whether the assessor

was blinded to group status during EMG processing. Lack of assessor blinding is especially relevant because heel-strike detection and gait-cycle selection involved video-based judgment.

In the Participants paragraph, the sentence “The sample size was calculated using GPower... indicating a minimum of 15 participants per group. However... 14 participants... were ultimately enrolled*” raises a major methodological concern. The achieved sample size was less than half of the required total sample, which substantially compromises statistical power and precision. The authors should either frame the work explicitly as a pilot/exploratory study or provide a revised post hoc precision-based justification, including effect sizes and confidence intervals.

In the Gait Cycle Segmentation and Parameter Extraction section, the use of video-recorded heel strikes should be described with greater methodological precision. The authors should report the camera frame rate, synchronization procedure, criteria for heel-strike identification, and whether the same assessor segmented all cycles. Without these details, the accuracy of onset and offset values expressed as percentages of the gait cycle is difficult to evaluate.

Authors revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

In the Participants paragraph, the reported demographic characteristics are internally inconsistent with the inclusion criterion of normal BMI. The Methods state that BMI was required to be “within the normal range (18.5–24.9 kg/m²),” but Table 1 reports mean BMI values of 25.01 and 25.15 kg/m². The authors should resolve this inconsistency by correcting the inclusion criterion, recalculating BMI, or explaining whether borderline overweight participants were included.

In the Inclusion and Exclusion Criteria paragraph, the diagnosis of piriformis syndrome is described as being based on “clinical examination and positive provocative tests (Freiberg, Pace, and FAIR tests).” The authors should specify whether all three tests had to be positive, whether pain reproduction location was standardized, how long symptoms had been present, whether symptom laterality was recorded, and whether lumbar radiculopathy was ruled out through neurological examination, imaging, or electrodiagnostic testing.

In the Outcome Measures and Electromyographic Variables paragraph, the authors state that onset, offset, minimum amplitude, and maximum amplitude were extracted from “three consecutive gait cycles.” This is insufficient for stable EMG estimation during walking, especially with small samples. The authors should justify why only three cycles were analyzed despite recording 20–25 cycles, and they should consider reanalyzing a larger number of gait cycles to improve reliability.

In the Electromyography Equipment and Instrumentation paragraph, the manuscript reports online filtering between “10 and 500 Hz,” while the later Signal Processing section reports offline filtering between “20 Hz and 450 Hz.” The authors should clarify the complete signal-processing pipeline and explain whether the signal was filtered twice. If both online and offline filters were applied, the implications for amplitude and timing detection should be discussed.

In the Skin Preparation and Electrode Placement section, the reference-electrode description is inconsistent. The instrumentation paragraph states that the reference electrode was placed on the lateral epicondyle of the femur, while the muscle-specific descriptions later state different reference placements, such as the sacrum, lateral femoral condyle, and iliac crest. The authors should distinguish between ground/reference electrode and bipolar recording electrodes, and revise terminology according to accepted surface EMG reporting standards.

In the Experimental Protocol and Gait Assessment paragraph, the sentence “preferred walking speed was determined... between 3.5 and 4.5 km/h” requires more detail. The authors should report actual walking speeds for each group and test whether groups differed in walking speed. Since gait speed strongly affects EMG timing and amplitude, failure to control or report speed may confound the observed between-group differences.

Authors revised the manuscript and uploaded the updated document.

2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.