# Correlation of lower extremity functional scale and electrodiagnostic findings in patients with sciatic neuropathy

*Halil Can Alaydın*[1], *Sıdıka Büyükvural Şen*[2], *Özlem Kızıltaş*[3], *Halit Fidancı*[1]

1 Department of Neurology, Division of Clinical Neurophysiology, University of Health Sciences, Adana City Training and Research Hospital, Adana, Türkiye
2 Department of Physical Therapy and Rehabilitation, University of Health Sciences, Adana City Training and Research Hospital, Adana, Türkiye
3 Seyhan Health Directorate, Adana, Türkiye

## Abstract

**Aim:** Sciatic nerve has an essential role in sensorimotor innervation of the lower extremities. This study explored the association between electrophysiological findings and lower extremity function in patients with sciatic neuropathy.

**Methods:** This retrospective study analyzed the electrophysiological data of 41 patients with sciatic neuropathy who underwent evaluation between January 2023 and August 2024. Lower extremity function was evaluated with the Lower Extremity Functional Scale (LEFS), while neuropathic pain was assessed using the Douleur Neuropathique 4 (DN4) questionnaire.

**Results:** The median LEFS score was 29, reflecting significant functional impairment, while 95.1% of patients exhibited neuropathic pain based on DN4 scores. LEFS scores showed a significant correlation with the compound muscle action potential (CMAP) amplitudes of the abductor hallucis brevis (Spearman rho: 0.52, $p < 0.001$) and extensor digitorum brevis (Spearman rho: 0.32, $p = 0.04$) muscles.

**Conclusions:** This study provides novel evidence on the critical role of posterior tibial and peroneal nerve dysfunction in lower extremity impairment in sciatic neuropathy patients. The stronger correlation of LEFS with posterior tibial nerve function underscores its importance in high-effort activities. We propose that electrophysiological findings may facilitate a more objective evaluation of functional impairment in sciatic neuropathy patients and aid in the development of targeted rehabilitation strategies.

***Keywords***: *Sciatic neuropathy; lower extremity; neuropathic pain; electromyography; nerve conduction studies*

## 1. Introduction

The sciatic nerve is the longest and largest nerve originating from the lumbosacral plexus and is essential for the innervation of the lower extremity muscles. Sciatic neuropathy (SN) is the second most prevalent neuropathy affecting the lower limbs since it is vulnerable to injury at various locations along its extensive anatomical pathway.[1] Etiologies of SN may include penetrating trauma, bone fractures, gluteal intramuscular inject-ions, pelvic or hip surgeries, hip dislocation, surgical positioning, tumor or hematoma compression, piriformis syndrome, auto-immune processes, inflammation, radiation, and ischemia [2].

Electrophysiological assessments are essential for diagnosing sciatic neuropathies and localizing the injury site.[1] While electrophysiological research in this area is limited, available studies generally indicate that axonal damage frequently affects the sciatic nerve or its branches, predominately in the peroneal division.[3,4] Prior research has demonstrated that compound muscle action potentials (CMAP) of the tibial and peroneal nerve and sensory nerve action potentials (SNAP) of the sural nerve correlate with prognosis and the severity of neuropathic pain.[4–7] Furthermore, some studies suggest that the extent of neurogenic involvement observed in needle electromyography (EMG) examinations may vary according to the etiology of SN, distinguishing injection neuropathy from other causative factors.[3,6]

The Lower Extremity Functional Scale (LEFS) was developed to assess the functional status of the lower extremities in individuals with musculoskeletal disorders.[8] Evidence from the literature indicates that the LEFS can be reliably employed in clinical practice to assess the impact of various conditions on lower extremity function.[9]

Sciatic neuropathies can compromise lower extremity function

*Corresponding Author: Halil Can Alaydın, calaydin@hotmail.com, Department of Neurology, Division of Clinical Neurophysiology, University of Health Sciences, Adana City Training and Research Hospital, Adana, Türkiye* *Received: 21.03.2025, Accepted: 23.06.2025, Available Online Date: 30.06.2025 https://doi.org/10.36516/jocass.1663040*

through sensory-motor deficits and neuropathic pain. However, the impact of sciatic neuropathy on LEFS has not been specifically investigated. This study seeks to bridge this gap in the literature. We sought to evaluate the relationship between clinical and electrophysiological aspects of sciatic neuropathy and the LEFS. Considering that the sciatic nerve has an essential role in the sensory-motor innervation of the lower extremity, we hypothesized that certain electrophysiological findings associated with SN could significantly affect LEFS outcomes.

## 2. Materials and Methods

This retrospective study was conducted through analysis of patients who were referred to the electrophysiology laboratory of the Neurology Department at Adana City Training and Research Hospital with a preliminary diagnosis of sciatic neuropathy between January 2023 and August 2024. The study received approval from the local ethics committee (Registration number:118/15.08.2024).

### 2.1. Subjects

Clinical and demographic data, neurological examination findings, etiology and time since injury (in months), electrodiagnostic test results, and radiological findings were documented. Patients diagnosed with sciatic neuropathy were included in the study if they fulfilled all of the following criteria:

1- Weakness of lower extremity muscles innervated by the sciatic nerve or its branches, including knee flexion and foot dorsiflexion/eversion or plantar flexion/inversion
2- Sensory disturbances in areas supplied by the sciatic nerve or its branches, including the dorsum of the foot/lateral leg, sole of the foot, or posterolateral leg
3- Abnormalities of at least two branches of the sciatic nerve (posterior tibial, peroneal, or sural) in nerve conduction studies (NCS)
4- Needle EMG abnormalities in at least one muscle innervated by the sciatic nerve or its branches

Exclusion criteria included any of the following:

1- Evidence of peripheral neuropathy on electro-physiological examination or a condition likely to cause peripheral neuropathy (e.g., diabetes mellitus)
2- Findings from electrodiagnostic tests or radiological imaging consistent with lumbosacral radiculopathy or plexopathy

Lower extremity functions were evaluated using the validated Turkish version of the Lower Extremity Functional Scale [10]. This scale includes 20 items, each scored on a 5-point scale from 0 to 4, resulting in a total score of 80; higher scores reflect better functional capacity [8]. Douleur Neuropathique 4 (DN4) questionnaire was utilized to evaluate neuropathic pain, which comprises ten items with a cut-off score of four.[11,12]

### 2.2. Electrophysiological Evaluation

All electrophysiological evaluations were performed by authors, following protocols similar to those used in previous studies.[6,13] Electrodiagnostic evaluations were conducted with the Cadwell Sierra Summit EMG unit (Cadwell Laboratories, Kennewick, Washington, USA). Surface electrodes were utilized for both stimulation and recording in nerve conduction studies. Electrodiagnostic tests were conducted if the limb temperature was ≥ 32°C; extremities below this temperature were warmed. NCS were carried out bilaterally on the lower extremities. Bandpass filters for sensory and motor NCS set to 20 Hz–2 kHz and 20 Hz–10 kHz, respectively. The sweep speed and sensitivity settings were set to 1 ms/10 µV per division for sensory studies and 5 ms/2 mV for motor studies, respectively. SNAP and CMAP amplitudes were measured from peak to peak.

Antidromic sensory NCS was performed to record sural and superficial peroneal nerve SNAPs. CMAP was recorded from the abductor hallucis brevis (AHB) muscle for the posterior tibial nerve and the extensor digitorum brevis (EDB) and tibialis anterior (TA) muscles for the peroneal nerve. The reference values for NCS from our prior research were used to define the normal limits [14,15]. NCS results were considered abnormal if either CMAP or SNAP was absent, outside the normal range, or if the amplitude was less than 50% of the corresponding nerve on the contralateral lower extremity. Based on previous studies [4,15]. CMAP and SNAP amplitudes were graded as follows: Grade 1: CMAP or SNAP amplitudes are within normal reference limits and exceed 50% of the amplitude in the contralateral limb; Grade 2: CMAP or SNAP amplitudes are within normal reference limits but are less than 50% of the amplitude in the contralateral limb; Grade 3: CMAP or SNAP amplitudes are below the lower reference limit; Grade 4: CMAP/SNAP amplitudes are absent.

Needle EMG was performed using a concentric needle electrode (length = 50 mm, diameter = 0.46 mm; Bionen Medical Devices, Florence, Italy). Bandpass filters was set at 10 Hz-10 kHz. The bandpass filter was set to 10 Hz-10 kHz. Positive sharp waves and fibrillation potentials were evaluated with a sensitivity of 100 µV/division and a sweep speed of 10 ms/division during resting. Motor unit action potentials (MUAP) were analyzed during mild muscle contraction, with a sensitivity between 500-1,000 µV/division and a sweep speed of 10 ms/division. MUAPs were classified as neurogenic if the duration exceeded 15 ms and the amplitude was greater than 4 mV. Depending on the patient's tolerance level, needle EMG was applied to the tibialis anterior, medial gastrocnemius (MG), peroneus longus (PL), both short and long heads of the biceps femoris, vastus lateralis, gluteus medius, and gluteus maximus muscles. Paraspinal muscles at levels L3, L4, L5, and S1 were examined if lumbosacral radiculopathy was suspected. Additionally, saphenous and femoral nerve conduction studies were performed, and needle EMG was applied to the vastus lateralis, adductor longus, and iliopsoas muscles in cases with suspected lumbosacral plexopathy. The needle EMG examination was considered abnormal if there were acute (positive sharp waves and fibrillation potentials) or chronic (increased MUAP duration and amplitude) neurogenic findings in the evaluated muscle.

### 2.3. Statistical Analysis

Statistical analysis was conducted using SPSS version 20 (IBM, Armonk, New York). Shapiro-Wilk test was utilized to evaluate the normality of data distribution. Categorical data are presented as numbers and percentages (%). Numerical variables with a normal distribution are presented as mean ± standard deviation (SD), while other variables are presented as medians and interquartile ranges (IQR). Pearson's chi-square test was used to analyze differences between categorical parameters. Since most of the electrophysiological data were non-parametric, the Mann-Whitney U and Wilcoxon signed-rank tests were used for group comparisons, and Spearman's rank correlation test was applied for correlation analysis. A p-value of less than 0.05 was considered indicative of statistical significance.

## 3. Results

Among the 52 patients referred to our clinic with a preliminary diagnosis of sciatic neuropathy, 41 (33 male, 8 female) were included in the study. Eleven patients were excluded: six due to evidence of peripheral neuropathy and five based on radiological or electrodiagnostic findings suggestive of lumbosacral radiculopathy.

Table 1

Etiologies of sciatic neuropathy

| Etiology | Number of patients (%) |
|---|---|
| Pelvic or hip surgery | 13 (31.7%) |
| Gluteal intramuscular injection | 10 (24.3%) |
| Gunshot wound | 8 (19.5%) |
| Penetrating trauma | 4 (9.7%) |
| Trauma from earthquake debris entrapment | 4 (9.7%) |
| Malignancy | 1 (2.4%) |
| Piriformis hematoma | 1 (2.4%) |

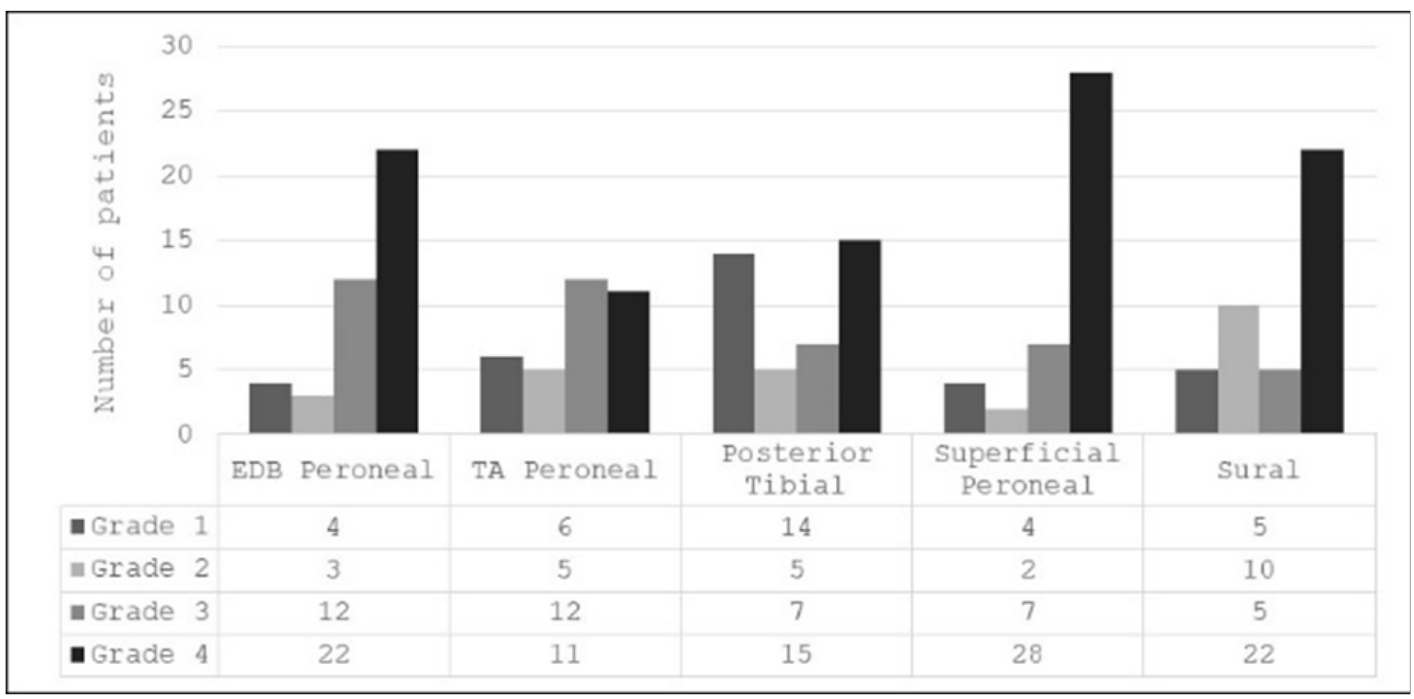
Table 2

Neurological examination findings in sciatic neuropathy patients

| Sensory deficits | Number of patients (%) |
|---|---|
| Posterolateral leg | 30 (73.1%) |
| Dorsum of the foot/lateral leg | 28 (68.2%) |
| The sole of the foot | 27 (65.8%) |
| **Motor deficits** | **Number of patients (%)** |
| Dorsiflexion/eversion of the foot | 33 (80.4%) |
| Plantar flexion/inversion of the foot | 27 (65.8%) |
| Knee flexion | 14 (34.1%) |

Figure 1

Grading of CMAP/SNAP amplitudes in the evaluated nerves (EDB: Extensor digitorum brevis, TA: Tibialis anterior, CMAP: Compound muscle action potential, SNAP: Sensory nerve action potential)




The mean age was 35.2 ± 14.9 years (range: 17–63 years), and the mean body mass index (BMI) was 23.2 ± 3.7 kg/m$^2$ (range: 17.7–31.6 kg/m$^2$). The time interval between injury and the electrodiagnostic study averaged 24.4 ± 35.9 months (range: 1-144 month). The etiologies of sciatic neuropathy are summarized in Table 1.

The most common sensory deficit was at the posterolateral leg within the sural nerve innervation area (73.1%), while the most frequent weakness was foot dorsiflexion or eversion (80.4%). Neurological examination findings are summarized in Table 2. The most frequent NCS abnormalities were found in the EDB-recorded peroneal nerve (90.2%) and the superficial peroneal nerve (90.2%). Abnormality rates and mean values of CMAP and SNAP amplitudes of assessed nerves are detailed in Table 3. Wilcoxon signed-rank test indicated that CMAP amplitude grading of the peroneal nerve recorded from the EDB was significantly higher than the peroneal nerve recorded from the TA [median (IQR): 4(1) vs. 3(2), p = 0.012], as well as the posterior tibial nerve [median (IQR): 4(1) vs. 3(3), p = 0.12]. Figure 1 illustrates the gradings of the evaluated nerves.

The tibialis anterior, medial gastrocnemius, and peroneus longus muscles were evaluated in all 41 patients, while the short and long heads of the biceps femoris were assessed in 33 and 27 patients, respectively. Table 4 summarizes the rate of neurogenic signs (acute or chronic) detected in the needle EMG.

The median (IQR) LEFS and DN4 scores were 29(25.3) (range: 8–75) and 8(2) (range: 2–10), respectively. According to the DN4 scale, 39 patients (95.1%) exhibited neuropathic pain. Since LEFS and DN4 scores did not have a normal distribution, non-parametric tests were employed.

**Table 3**

The number of abnormalities and the median (IQR) CMAP/SNAP amplitudes for the evaluated nerves.

| Motor Nerves (number of patients) | Number of abnormal measurements (%) | CMAP (mV) median (IQR) |
|---|---|---|
| EDB recorded peroneal nerve (41) | 37 (90.2%) | -* |
| TA recorded peroneal nerve (29) | 29 (70.7%) | 1.5 (5.6) |
| AHB recorded posterior tibial nerve (41) | 27 (67.9%) | 6.3 (16) |
| **Sensory Nerves (number of patients)** | **Number of abnormal measurements (%)** | **SNAP (μV)** |
| Superficial peroneal nerve (41) | 37 (90.2) | -* |
| Sural nerve (41) | 36 (87.8) | -* |

**The CMAP of the peroneal nerve recorded from the EDB and the SNAPs of the sural and superficial peroneal nerves could not be obtained in most cases, resulting in a median value of zero. (AHB: Abductor hallucis brevis, CMAP: Compound muscle action potential, EDB: Extensor digitorum brevis, IQR: Interquartile range, SNAP: Sensory nerve action potential, SD: Standart deviation, TA: Tibialis anterior, mV: Millivolt, μV: Microvolt)*

**Table 4**

Frequency of acute or chronic neurogenic signs in needle electromyography

| Muscle (number of patients) | Acute or chronic neurogenic findings (%) |
|---|---|
| Tibialis Anterior (41) | 34 (82.9%) |
| Peroneus Longus (41) | 32 (78%) |
| Medial gastrocnemius (41) | 27 (65.9%) |
| Short head of biceps femoris (33) | 22 (66.7%) |
| Long head of biceps femoris (27) | 14 (51.9) |

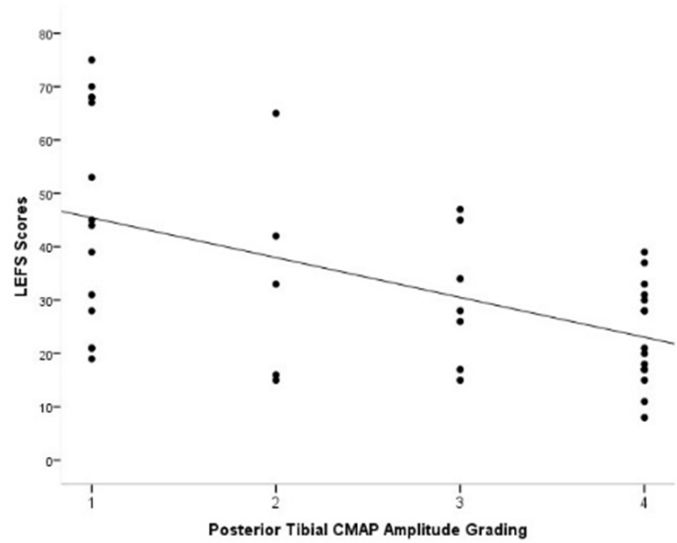
No significant effects of etiology or neurological examination findings were observed on LEFS and DN4 scores or the presence of neuropathic pain ($p > 0.05$). However, the Mann-Whitney U test indicated that the difference in LEFS scores between patients with and without weakness in plantar flexion or inversion nearly reached statistical significance [median (IQR): 26(16) vs 42(42), $p = 0.053$].

Nerve conduction study findings indicated that patients with abnormal posterior tibial CMAP had significantly lower LEFS scores [median (IQR): 26(17) vs. 44.5(41.8), $p = 0.03$]. Also, sural nerve SNAP abnormalities were associated with higher DN4 scores [median (IQR): 10(1.5) vs.8(2), $p = 0.07$]. Needle EMG evaluations revealed that neurogenic involvement in the peroneus longus and short head of the biceps femoris muscles are related to lower LEFS scores [median (IQR): 26(20) vs 65(37.5), $p = 0.001$ and 21(19.5) vs. 42(40), $p = 0.026$, respectively]. Additionally, significantly higher DN4 scores [median (IQR): 8(2) vs. 7(2), $p = 0.016$] were found when there were neurogenic findings in the needle EMG evaluation of the short head of the biceps femoris muscle.

Correlation analysis revealed a positive correlation between LEFS scores and both posterior tibial CMAP amplitude (Spearman rho: 0.52, $p < 0.001$) and peroneal CMAP amplitude recorded from the EDB (Spearman rho: 0.32, $p = 0.04$). There was also a negative correlation between LEFS scores and posterior tibial CMAP amplitude grading (Spearman rho: -0.49, $p = 0.001$), as shown in Figure 2.

**Figure 2**

Illustration of the negative correlation between LEFS scores and posterior tibial nerve CMAP amplitude grading




*LEFS: Lower extremity functional scale, CMAP: Compound muscle action potential*

## 4. Discussion

This study demonstrates that sciatic neuropathy significantly impairs lower extremity functions, as assessed by the LEFS. Moreover, as a novel finding, various electrophysiological parameters were found to have a significant association with the extent of functional impairment in the lower extremities.

Among the 52 cases meeting the inclusion criteria, 11 were excluded due to the presence of exclusion criteria. These patients exhibited findings indicative of either widespread peripheral neuropathy or lumbosacral radiculopathy coexisting with sciatic neuropathy. Since these conditions could independently affect LEFS scores and potentially confound NCS and needle EMG findings associated with sciatic nerve injury, they were excluded from the study.

The electrophysiological findings in patients with sciatic neuropathy were consistent with those reported in previous studies, showing varying degrees of involvement across all branches, with the peroneal nerve being the most commonly affected.[2–4,16] The LEFS scores highlight the significant impact of sciatic neuropathy on lower extremity function in nearly all cases. No significant associations were identified between LEFS and DN4 scores and demographic characteristics, etiology of sciatic nerve injury, duration since injury, or neurological examination findings. However, a near-significant statistical association was observed between lower LEFS scores and weakness in plantar flexion or inversion, which are functions performed by muscles innervated by the posterior tibial nerve.[17]

Abnormal posterior tibial CMAP in NCS and neurogenic findings in the needle EMG evaluation of the peroneus longus and the short head of the biceps femoris muscles were associated with lower LEFS

scores. Correlation analyses further confirmed the relationship between LEFS scores and posterior tibial and peroneal CMAP amplitudes. These results suggest that electrophysiological evidence of damage in both motor branches of the sciatic nerve, particularly the posterior tibial branch, significantly impacts LEFS scores.

Most of the questions in the LEFS are designed to assess the effort-intensive functions of the lower extremities.[18] Given that the posterior tibial nerve innervates several muscles—such as the long head of the biceps femoris, gastrocnemius, and soleus—responsible for high-effort movements of the thigh and posterior leg compartment, its functional integrity is crucial. Therefore, damage to this nerve understandably results in more pronounced impairments on the LEFS.[17] Furthermore, the only neurological examination finding with a potential impact on the LEFS was weakness in plantar flexion or inversion, which are functions of these muscle groups.

Interestingly, while the presence of needle EMG abnormalities in muscles innervated by the posterior tibial nerve does not independently affect LEFS scores, neurogenic findings in the peroneus longus and short head of the biceps femoris muscles do have an independent impact on LEFS. Several factors may explain this finding. First, the short head of the biceps femoris was not evaluated in the needle EMG for all cases, which may result in insufficient analysis. Additionally, considering that the peroneal branch of the sciatic nerve is frequently affected (>90%), a limited number of cases remained for intergroup comparison, which could introduce statistical bias. Lastly, a muscle's functional capacity or strength is more closely tied to recruitment patterns than to the presence of acute or chronic neurogenic changes on needle EMG.[19,20] Given these considerations, it can be inferred that NCS abnormalities in the peroneal and posterior tibial nerves are more reliable indicators of functional impairment than neurogenic findings observed in needle EMG studies in SN patients.[21]

Another noteworthy finding is that while the CMAP recorded from the peroneal nerve at the EDB exhibited a significant relationship with LEFS, no association was observed with the TA-recorded peroneal nerve. This discrepancy may be attributed to the less pronounced injury to the nerve fibers innervating the TA muscle, possibly related to the fascicular organization of the sciatic nerve.[22] The abnormality rate in the TA-recorded peroneal nerve CMAP was 70.7%, compared to 90.2% in the EDB-recorded cases. Additionally, comparing the CMAP amplitude grading of these two nerves revealed more severe involvement in the EDB-recorded peroneal nerve. Considering that the peroneal nerve's function appears to have a less pronounced impact on LEFS than the posterior tibial nerve, it can be concluded that the relatively lower degree of involvement in the TA muscle likely accounts for its lack of independent effect on LEFS.

Finally, the DN4 scale indicates that neuropathic pain is commonly observed in SN patients, with a prevalence of 95.1%. The association between sural nerve SNAP abnormalities and neuropathic pain has been demonstrated in a previous study.[6] However, detecting abnormalities in the biceps femoris's short head through needle EMG constitutes a novel finding in this study. The short head of the biceps femoris is innervated by the main trunk of the sciatic nerve, and thus, damage to this muscle may reflect more extensive injury at the proximal levels of the sciatic nerve, potentially leading to broader sensory innervation impairment and more severe neuropathic pain.[1,17]

This study has several limitations. Firstly, the cases were evaluated at a single time point. Therefore, the temporal effects of electrophysiological findings on LEFS could not be assessed. Secondly, there is a broad time interval since the onset of the SN. Some patients were assessed during the acute phase, while others were in the chronic phase, and thus, electrophysiological findings could not be evaluated independently of the nerve regeneration process. Finally, a significant proportion of patients had sciatic neuropathy caused by physical trauma (such as fractures, penetrating injuries, or traffic accidents), which also resulted in damage to muscles, joints, or bones. So, it should be considered that these injuries may have been a confounding factor in some cases, in addition to sciatic neuropathy.

## 5. Conclusion

This study demonstrates a significant relationship between specific electrophysiological findings and lower extremity functions in patients with sciatic neuropathy for the first time in the literature. LEFS was significantly correlated with the CMAP amplitude of the posterior tibial nerve and less so with the EDB-recorded peroneal nerve. These findings could allow for a more objective assessment of functional loss in the lower extremities of SN patients. Therefore, large-scale, prospective studies must validate these results and investigate the effects of changing electrophysiological findings over time.

### Statement of ethics

Adana City Training and Research Hospital Ethics Committee approved the study with decision number 4-118 dated 15.08.2024


### Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.


### Conflict of interest statement

The authors declare that they have no conflict of interest.

### Availability of data and materials

This Data and materials are available to the researchers

### Author contributions

HCA, SBŞ: conceptualization, methodology, investigation, and writing – original draft. HCA, SBŞ, ÖK, HF: resources, formal analysis, and writing – review and editing. HCA, HF: conceptualization, methodology, and writing – review and editing. All authors read and approved the final version of the manuscript.

## References


1.Distad BJ, Weiss MD. Clinical and Electrodiagnostic Features of Sciatic Neuropathies. Phys Med Rehabil Clin N Am: 2013;24:107–120. [Crossref]
2.Hayat G, Calvin JS. Electrodiagnostic Assessment of Uncommon Mononeuropathies. Neurol Clin: 2021;39:957–981. [Crossref]
3.Yildiz FG, Uzuncakmak-Uyanik H, Aghamirzayeva K et al. Electrodiagnostic Features of Sciatic Neuropathy: Six-year Referral Center Experience. Neurol Sci Neurophysiol: 2023;40:145–151. [Crossref]
4.Yuen EC, So YT, Olney RK. The electrophysiologic features of sciatic neuropathy in 100 patients. Muscle Nerve: 1995;18:414–420. [Crossref]
5.Cherian RP, Li Y. Clinical and Electrodiagnostic Features Of Nontraumatic Sciatic Neuropathy. Muscle and Nerve: 2019;59:309–314. [Crossref]
6.Fidanci H, Öztürk I. The relationship between nerve conduction studies and neuropathic pain in sciatic nerve injury due to intramuscular injection. Korean J Pain: 2021;34:124–131. [Crossref]
7.Yuen EC, Olney RK, So YT. Sciatic neuropathy: clinical and prognostic features in 73 patients. Neurology: 1994;44:1669–1674. [Crossref]
8.Binkley JM, Stratford PW, Lott SA, et al. The Lower Extremity Functional Scale (LEFS): Scale development, measurement properties, and clinical application. Phys Ther: 1999;79:371–383. [Crossref]

9.Mehta SP, Fulton A, Quach C, et al. Measurement Properties of the Lower Extremity Functional Scale: A Systematic Review. J Orthop Sports Phys Ther: 2016;46:200–216. [Crossref]
10.Citaker S, Kafa N, Hazar Kanik Z, et al. Translation, cross-cultural adaptation and validation of the Turkish version of the Lower Extremity Functional Scale on patients with knee injuries. Arch Orthop Trauma Surg: 2016;136:389–395. [Crossref]
11.Walsh J, Rabey MI, Hall TM. Agreement and correlation between the self-report leeds assessment of neuropathic symptoms and signs and Douleur Neuropathique 4 Questions neuropathic pain screening tools in subjects with low back-related leg pain. J Manipulative Physiol Ther: 2012;35:196–202. [Crossref]
12.Unal-Cevik I, Sarioglu-Ay S, Evcik D. A comparison of the DN4 and LANSS questionnaires in the assessment of neuropathic pain: validity and reliability of the Turkish version of DN4. J pain: 2010;11:1129–1135. [Crossref]
13.Halil AC, Gul BM, Rumeysa P, et al. Neuropathic pain and mood disorders in earthquake survivors with peripheral nerve injuries. Ideggyogy Sz: 2024;77:97–102. [Crossref]
14.Fidanci H, Öztürk I, Köylüoğlu AC, et al. The needle electromyography findings in the neurophysiological classification of ulnar neuropathy at the elbow. Turkish J Med Sci: 2020;50:804–810. [Crossref]
15.Fidanci H, Öztürk İ, Köylüoğlu AC, et al. Bilateral Nerve Conduction Studies Must Be Considered in the Diagnosis of Sciatic Nerve Injury Due to Intramuscular Injection. Neurol Sci Neurophysiol: 2020;37.
16.Maqbool W, Sheikh S, Ahmed A. Clinical, electrophysiological, and prognostic study of postinjection sciatic nerve injury: An avoidable cause of loss of limb in the peripheral medical service. Ann Indian Acad Neurol: 2009;12:116–119. [Crossref]
17.Preston DC, Shapiro B. Electromyography and neuromuscular disorders clinical-electrophysiologic-ultrasound correlations [Internet]. 4th editio. Amsterdam: Elsevier; 2020
18.Stratford PW, Kennedy D, Pagura SMC, et al. The relationship between self-report and performance-related measures: questioning the content validity of timed tests. Arthritis Rheum: 2003;49:535–540. [Crossref]
19.Bromberg MB. The motor unit and quantitative electromyography. Muscle Nerve: 2020;61:131–142. [Crossref]
20.Rubin DI. Normal and abnormal voluntary activity. Handb Clin Neurol: 2019;160:281–301. [Crossref]
21.Abraham A, Drory VE, Fainmesser Y, et al. Muscle thickness measured by ultrasound is reduced in neuromuscular disorders and correlates with clinical and electrophysiological findings. Muscle Nerve: 2019;60:687–692. [Crossref]
22.Bäumer P, Weiler M, Bendszus M, et al. Somatotopic fascicular organization of the human sciatic nerve demonstrated by MR neurography. Neurology: 2015;84:1782–1787. [Crossref]