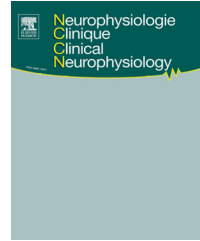




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ORIGINAL ARTICLE/ARTICLE ORIGINAL

Clinical findings and electrodiagnostic testing in 108 consecutive cases of lumbosacral radiculopathy due to herniated disc

Étude clinique et électrophysiologique de 108 cas consécutifs de radiculopathie lombosacrée due à une hernie discale

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Received 18 November 2012; accepted 29 May 2013

Available online 20 June 2013

KEYWORDS

Electrodiagnostic testing;
Electromyography;
Lumbosacral radiculopathy;
Herniated disc

Summary

Study aim. – This prospective study aim to examine whether clinical findings and electrodiagnostic testing (EDX) in patients with lumbosacral monoradiculopathy due to herniated disc (HD) differ as a function of root involvement level (L5 vs. S1) and HD zone (paramedian vs. intraforaminal).

Patients and methods. – All patients with L4, L5 or S1 monoradiculopathy were prospectively enrolled at four electromyography (EMG) labs over a 2-year period. The diagnosis was based on a congruence between patient history and MRI evidence of HD. We compared the sensitivities of clinical findings and EDX with respect to both root involvement level and HD zone. Multivariate logistic regression was performed in order to verify the association between abnormal EMG, clinical, and neuroradiological findings.

Results. – One hundred and eight patients (mean age 47.7 years, 55% men) were consecutively enrolled. Sensory loss in the painful dermatome was the most frequent finding at physical examination (56% of cases). EMG was abnormal in at least one muscle supplied by femoral and sciatic nerves in 45 cases (42%). Inclusion of paraspinal muscles increased sensitivity to only 49% and that of proximal muscles was useless. Motor and sensory neurography was seldom abnormal. The most frequent motor neurographic abnormalities were a delay of F-wave minimum latency and decrease in the compound muscle action potential amplitude from *extensor digitorum brevis* and *abductor hallucis* in L5 and S1 radiculopathies, respectively. Sensory neurography was

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MOTS CLÉS

EMG ;
Hernie discale ;
Radiculopathie
lombosacrée ;
Tests électrodiagnos-
tiques ;
Sciatique

usually normal, the amplitude of sensory nerve action potential was seldom reduced when HD injured dorsal root ganglion or postganglionic root fibres. Multivariate logistic regression analysis showed that EMG abnormalities could be predicted by myotomal muscular weakness, abnormal deep reflexes, and paraesthesiae. The only clinical and electrophysiological differences with respect to root involvement level concerned deep reflexes and motor neurography of deep peroneal and tibial nerves.

Conclusions. – Only some EDX parameters are helpful for the diagnosis of lumbosacral radiculopathy. EMG was abnormal in less than 50% of cases and its abnormalities could be predicted by some clinical findings. However, neurography is useful as a tool for differential diagnosis between radiculopathy and more diffuse disorders of the peripheral nervous system (polyneuropathy, plexopathy).

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Résumé

But de l'étude. – Cette étude prospective menée chez des patients présentant une monoradiculopathie due à une hernie discale visait à déterminer les modifications de l'examen clinique et électrophysiologique en fonction du niveau (L5 ou S1) et du site de la hernie (paramédiane ou intraforaminale).

Patients et méthodes. – Quatre laboratoires de neurophysiologie ont inclus tous les patients admis pour une monoradiculopathie L4, L5 ou S1 sur une période de deux ans. Le diagnostic était basé sur la congruence entre l'anamnèse et l'IRM montrant une hernie discale. Nous avons comparé les sensibilités de l'examen clinique et neurophysiologique en fonction du niveau et du site de compression. Au moyen de régressions logistiques multivariées, nous avons vérifié quelles étaient les associations entre anomalies cliniques, électrophysiologiques et neuroradiologiques.

Résultats. – Cent-huit patients consécutifs (âge moyen : 47,7 ans, 55 % d'hommes) ont été inclus. Le symptôme le plus fréquent à l'examen clinique était un déficit sensitif dans le dermatome douloureux (56 %). L'EMG était anormal dans un moins un muscle dépendant du nerf fémoral et du tronc sciatique dans 42 % des cas. L'inclusion de muscles paraspinaux n'augmentait la sensibilité que de 7 % (49 %) et celle de muscles proximaux était inutile. L'examen neurographique moteur ou sensitif était rarement anormal. Les anomalies neurographiques les plus fréquentes étaient une augmentation du temps de latence minimum de l'onde F et une réduction d'amplitude du potentiel moteur au niveau du muscle pédieux ou de l'abducteur de l'hallux, pour les radiculopathies L5 et S1, respectivement. La neurographie sensitive était généralement normale, l'amplitude du potentiel d'action de nerf sensitif étant diminuée dans les rares cas de souffrance du ganglion spinal ou des fibres sensibles distales par rapport au ganglion spinal. Les études multivariées démontraient que les anomalies de l'EMG pouvaient être prédites par la faiblesse musculaire dans le myotome correspondant, l'anomalie des réflexes et les paresthésies. Les seules différences cliniques et neurophysiologiques en fonction du niveau de la hernie concernaient les réflexes et la neurographie motrice des nerfs tibiaux et péroniers profonds.

Conclusions. – Seuls quelques paramètres électrophysiologiques sont utiles pour le diagnostic des radiculopathies lombosacrées. L'EMG n'est anormal que dans 50 % des cas et ses anomalies sont prédites par la clinique. L'examen neurographique reste cependant utile pour le diagnostic différentiel avec les polyneuropathies ou les atteintes plexiques.

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Introduction

Low-back pain with or without dermatomal painful lower-limb radiation is a common and disabling problem. It is estimated that 15% to 20% of adults present with low-back pain during a single year and that 50% to 80% experience at least one episode of back pain during a lifetime [33]. The incidence of symptomatic lumbar radiculopathy among individuals serving in the United States military, is 4.86 per 1000 person-years [35]. A review of epidemiological studies shows that the prevalence of symptoms of sciatica reported in the literature ranges from 1.2% to 43% [24].

As they provide structural detail of the spine and surrounding structures (CT and MRI) and physiological evidence

of root injury (electromyography: EMG), neuroradiological imaging and electromyography are commonly used to correctly diagnose a radiculopathy. Numerous studies were published on the sensitivity and specificity of EMG comparing the EMG results with clinical findings, neuroradiological spine imaging or direct surgical observation [1,3,9,17,23,26,31,38,40]. Many exhaustive reviews were reported [2,12,16,32,34,37,39,44]. These studies are difficult to compare because of differences in patient inclusion criteria, methods for electrodiagnosing testing (EDX), and golden standards for diagnosis of radiculopathy. Often CT/MRI showed multiple alterations of the lumbosacral spine and sometimes the symptoms that were reported by the patient and the objective findings did not match with

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