Cauda equina motor conduction time

Lumbar spinal stenosis (LSS) is a chronic degenerative disease with pain in the back, buttocks and legs aggrevated by walking and relieved after rest without associated vascular disease of lower extremities observed in patients between 50 and 60 years. Several studies, using different methods indicated an association between slowing or blocking of root-nerve conduction and LSS. None of the previous research had applied the more conceivable methods such as recording the cauda equina potentials from the lumbar level or stimulating the spinal roots within the canal using either leg nerves or muscles. In this study, electrical lumbar laminar stimulation was used to demonstrate prolongation of cauda equina motor conduction time in lumbar spinal stenosis. METHODS: Twenty-one LSS patients and age matched 15 normal control subjects were included in the study. Lumbar laminar electrical stimulation from L1 and L5 vertebra levels were applied by needle electrodes. Compound muscle action potential (CMAP) from gastrocnemius muscles were recorded bilaterally. Latency difference of CMAPs obtained from L1 and L5 spine levels were accepted as the cauda equina motor conduction time (CEMCT). RESULTS: CEMCT was significantly longer in patient group when compared to normal controls. Mean latency difference was 3.59 ± 1.07 msec on the right side, 3.49 ± 1.07 msec on the left side in LSS group, it was 1.45 ± 0.65 msec on the right side, 1.35 ± 0.68 msec on the left side on normal control group ($p<0.0001$). CONCLUSIONS: The prolongation of CEMCT was statistically and individually significant in patient group. This may indicate that lower lumbosacral motor roots were locally and chronically compressed due to lumbar spinal stenosis. Lumbar spinal stenosis may have induced local demyelination at the cauda equina level. SIGNIFICANCE: Since the prolongation of CEMCT was found only in patients with LSS, the method of laminar stimulation can be chosen for patients with uncertain diagnosis of LSS [1)].

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Seçil Y, Ekinci AS, Bayram KB, Incesu TK, Tokuçoğlu F, Gürgör N, Özdemirkıran T, Başoğlu M, Ertekin C. Diagnostic value of cauda equina motor conduction time in lumbar spinal stenosis. Clin Neurophysiol. 2012 Sep;123(9):1831-5. doi: 10.1016/j.clinph.2012.02.070. Epub 2012 Mar 12. PubMed PMID: 22418591.