Electrical muscle testing (determination of rheobase, chronaxy and accommodation index) in the diagnosis of Carpaltunnel Syndrome

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Introduction: Electrical muscle testing (determination of rheobase, chronaxy and accommodation index) has largely disappeared from clinical routine. However, it should be remembered that electrical muscle testing can be conducted rapidly and non-invasively, and that the required equipment is inexpensive.

Purpose : To determine the correlation between the parameters of electrical muscle testing and the neurophysiological grading of the severity of Carpaltunnel Syndrome (CTS).

Method: Thirty-seven patients with suspected CTS were included in this prospective study for electrical muscle testing of the abductor pollicis brevis muscle. Furthermore regular nerve conduction studies of the median nerve were conducted and a neurophysiological grading for CTS was performed: 0 = no: distal motor latency normal (dml), sensory antidromic nerve conduction velocity normal (sNCV); 1 = mild: dml < 4.5 ms, sNVC < 40m/s; 2 = moderate: dml 4.5 < x < 6.5 ms, sNCV < 40m/s or no response); 3 = severe: dml > 6.5 ms, sNCV no response.

A correlation coefficient according to Spearman was calculated to obtain the relationship between the neurophysiological grading of the severity of CTS and the parameters of electrical muscle testing.

Results :A low but significant ($p < 0.05$) correlation was found between the neurophysiological grading and the accommodation index ($r = - 0.35$) and a moderate significant ($p < 0.01$) correlation was found between the neurophysiological grading and the chronaxy ($r = 0.61$).

Conclusions :The electrical muscle testing in particular the determination of the chronaxy of the abductor pollicis brevis muscle correlates with the severity of CTS and might be helpful in the diagnosis of an axonal lesion of the median nerve. In future studies a comparison with needle-EMG should be performed.