Single Fiber EMG in Patients with Myasthenia Gravis

Voháňka S1,2, Chmelíková M1, Bednařík J1,2

1 Masaryk University and University Hospital, Department of Neurology, Brno, Czech Republic, 2 Central European Institute of Technology, CEITEC, Masaryk University, Brno, Czech Republic

Background

Single fiber electromyography (SFEMG) is a valuable tool in the diagnostics of the neuromuscular transmission, esp. myasthenia gravis. It has been proved as the most sensitive method in comparison with repetitive stimulation and antibody examination (ACHR, MUSK).

Objective

To verify the sensitivity of the end-plate jitter measurement among patients with myasthenia gravis in Neuromuscular Centre UH Brno

Patients and Methods

The group of 143 patients suffering from MG has been examined; 68 females and 75 males, the mean age was 56 years (range 13-90 years). Disease was classified as ocular in 38 cases (26%), bulbar or oculobulbar in 44 cases (31%), and 61 patients have had generalized form (43%). For the end-plate jitter measurement we used an extramuscular axonal microstimulation technique and registration, as published by Trontelj et al.

A needle cathode was inserted subcutaneously to stimulate facial nerve branches to the orbicularis oculi muscle. The anode was a surface electrode. A SFEMG electrode was inserted into the lateral portion of the orbicularis oculi muscle. Twenty end-plates were regularly examined. The test was considered abnormal if any of the following criteria was met:

- Mean MCD was longer than 23 µs
- More than 2 or more than 10% of end plates had blocking or jitter greater than 35 µs

Results

Antibodies positivity (anti-AChR Ab or anti-MUSK Ab) was present in 127 patients (89%), but SFEMG was positive in 133 persons (93%). Twelve seronegative (ACHR+MUSK) patients had positive SFEMG, on the contrary among 10 persons with negative SF EMG the diagnosis was confirmed in 6 cases by positive antibody assay. Only four seronegative patients had also negative SFEMG. Two are suffering from ocular and two from oculobulbar form of MG. The combined diagnostic positivity (antibody assay or SFEMG) was 97%. We did not find any correlation between severity of disease (measured by MGFA ADL score) and jitter abnormalities or a clinical form of MG.

Conclusion

The SFEMG using extramuscular axonal microstimulation of the orbicularis oculi muscle has the high sensitivity in diagnostics of MG and could be recommended as a reliable test for MG regardless of the severity and clinical form.