

## Objective assesment of sympathetic electrodermal activity in patients with masticatory muscle pain

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### Abstract

**Background:** Masticatory muscle pain is associated with autonomic disorders of different intensity; their identification leads to a more accurate diagnosis and a differentiated treatment. Currently, various scales and autonomic tests are used for this purpose, as well there are being developed neurophysiological diagnostic methods. For this purpose, electrodermal activity is being studied since the 1950s, which currently is further advancing due to modern recording and information processing technologies. The aim of the study was objective assesment of sympathetic nervous system activity (tonus, provisioning) in patients with masticatory muscle pain, with the application of the spectral analysis of electrodermal activity. **Material and methods:** Thirty-four female patients with masticatory muscle pain were enrolled in the study. NeuroMEP (Neurosoft) diagnostic system was used to record electrodermal activity. For the assesment of the autonomic tone (rest) and autonomic provisioning (maxillary clenching test) there were used EDASymp, EDASympn, meanTVSymp, minTVSymp, maxTVSymp sympathetic indices, identified experimentally at the University of Connecticut (USA).

**Results:** The comparative analysis of the indices has shown that EDASympn and meanTVSymp are reproducible and characterize the activity of the sympathetic system during the rest and maxillary clenching. The range of values of sympathetic indices at rest/maxillary clenching were: EDASympn (0.222 – 0.668/0.360 – 0.4872 u.n.) and meanTVSymp (0.883 – 1.015/1.055 – 1.245).

**Conclusions:** EDASympn (normalized sympathetic component of the electrodermal activity) and meanTVSymp (index of sympathetic tone) sympathetic indices allow the objective assesment of the activity of the sympathetic nervous system, being reproducible in patients with myalgias.

**Key words:** masticatory muscles, myalgia, sympathetic electrodermal activity.

## Anxiety and sympathetic skin responses in patients with masticatory muscle pain

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### Abstract

**Background:** An important clinical aspect of masticatory muscle pain is its association with autonomic disorders and various mental states. Sympathetic skin response is a non-invasive approach for assesing sympathetic system function, allowing the determination of several autonomic indices (amplitudes), but their clinical interpretation is difficult. The aim of the study was to differentiate variants of sympathetic skin response and their correlations with the level of anxiety and pain intensity in patients with masticatory muscle pain.

**Material and methods:** There were enrolled 46 patients with masticatory muscle pain who were examined in standardized conditions with NeuroMEP (Neurosoft) for assesing sympathetic skin responses (SSR) – sympathetic amplitude (A2). There were used cutoffs for different SSR variants: 1) V1 – optimal A2 = 3.34 – 3.5 mV; 2) V2 – amplified A2 ≥ 3.51 mV; 3) V3 – diminished A2 ≤ 3.33 mV. There were used clinical indices: GAD7 questionnaire (anxiety level), CPI index (Characteristic Pain Intensity).

**Results:** There were observed the following variants in patients with masticatory muscle pain: V1 – 16 patients (34.78%); V2 – 25 patients (54.35%); V3 – 5 patients (10.87%). Patients with V2 variant had higher levels of anxiety (mean GAD7 score = 17.1): 1) severe anxiety – 17 patients (68%); 2) moderate anxiety – 7 patients (28%); 3) low anxiety – 1 patient (4%). V2 variant patients also had higher mean CPI values (54.1 – high intensity pain).

**Conclusions:** There were observed different variants of sympathetic response in patients with masticatory muscle pain, the amplified variant correlated with more serious clinical indices (higher anxiety and pain intensity).

**Key words:** sympathetic skin response, masticatory muscle pain, anxiety.