

Abstract

Title: Electromyographic study of selected neck muscles in patients with torticollis

Objectives: The aim of the study was to determine the electrical muscle activity and the symmetry of the electrical muscle activity of selected neck muscles in patients with torticollis during flexion in three different positions – standing, sitting, lying on the back.

Methods: The study involved 8 probands aged 27 – 60 years. The Noraxon TeleMyo 2400T G2 surface electromyography device for telemetry data transmission technology with a sampling frequency of 1500 Hz was used for the measurement. The surface electrodes were applied to five target muscles bilaterally, namely the sternocleidomastoid muscle, scaleni muscles, suprahyoid muscles, infrahyoid muscles and trapezius muscle upper part. Subsequently, the probands performed cervical spine flexion fifteen times in a randomized order of positions in synchronism at the same speed by setting the metronome to 60 bpm. The electrical muscle activity of the examined muscles was used in average %MVC values in comparison right/left, as well as changes in average %MVC values depending on positions and symmetry of electrical muscle activity during neck flexion using Pearson's correlation coefficient.

Results: The values of the average %MVC of the contralateral SCM against the direction of chin twisting in torticollis were higher compared to the ipsilateral SCM in the supine position ($p>0.05$). The contralateral trapezius muscle relative to the direction of chin twisting in torticollis had higher average %MVC values compared to the ipsilateral trapezius muscle at all positions ($p>0.05$). The average %MVC values of the measured muscles were higher in the supine position compared to the other positions ($p<0.05$) with the exception of the trapezius muscle ($p>0.05$). The muscles engaged symmetrically during the movement, they had a moderate to strong correlation dependence ($p<0.05$) with the exception of scaleni muscles in the sitting position with the torticollis on the right and the trapezius muscle in each position. A weak correlation was measured in these muscles ($p>0.05$).

Keywords: SEMG, electromyography, surface electromyography, cervical dystonia, torticollis, sternocleidomastoid, MVC