

Supplemental Material S6. Neuromuscular mechanisms: empirical studies.

Author(s), year	Label	Criteria for MTD-1 diagnosis	Study groups	Assessment measures relevant to the neuromuscular category	Main results for the neuromuscular category
Hocevar-Boltezar et al., 1998	Muscle tension dysphonia (hyperfunctional dysphonia)	Laryngeal features based on Morrison and Rammage classification (1993)	G1: 11 patients with MTD-1 G2: 5 vocally healthy controls	Surface EMG (face and anterior neck)	No difference was found between the groups during silence. Right before phonation onset, healthy controls and 5/11 of patients with MTD-1 had a 2- to 3-fold increase in EMG activity. 6/11 of patients with MTD-1 had a 6- to 8-fold increase in EMG activity (lips and supralaryngeal area) and the increased activation was maintained during phonation, while the activation gradually decreased in other participants. In a subset of patients with MTD, an asymmetry in the onset and/or magnitude of EMG activity was noted between the right and the left sides (upper lip, suprahyoid and/or cricothyroid area).
Khoddami et al., 2017	Primary muscle tension dysphonia	Absence of laryngeal lesion/other voice disorder	G1: 15 patients with MTD-1 G2: 15 vocally healthy controls	Surface EMG (root mean square, peak activity, activity duration, time to peak) of: 1) the thyrohyoid group: thyrohyoid, omohyoid, sternohyoid, and 2) the cricothyroid group: cricothyroid, sternohyoid).	There was no significant difference in EMG activity (any parameter) between the MTD-1 and control groups ($p > .05$) during sustained vowel phonation.
Lu et al., 2021	Functional dysphonia	Not specified	G1: 47 patients with MTD-1 G2: 22 vocally healthy controls	Surface EMG (root mean square of amplitude signal, median frequency of frequency signal) of:	There was a greater amount of prephonation recruitment and postphonation persistence of EMG activity in the patient group when compared to

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				1) trapezius, 2) sternocleidomastoid, 3) suprahyoid group, 4) infrahyoid group, and 5) cricothyroid	vocally healthy subjects ($p < .05$). Significant between-groups differences in RMS amplitude during all tasks for the infrahyoid, suprahyoid, and cricothyroid muscle groups (MTD increased relative to controls) ($p < .05$). Significant between-groups differences in RMS amplitude during loud and loud/high sustained vowel production for the sternocleidomastoid muscles (MTD increased relative to controls) ($p < .05$). Significant between-groups differences in median frequency during all tasks for the infrahyoid muscle group (MTD increased relative to controls) ($p < .05$).
Redenbaugh & Reich, 1989	Hyperfunctional voice disorders	"Clinical signs of vocal hyperfunction"	G1: 7 patients with hyperfunctional dysphonia (*some patients had a history of vocal fold pathology - it is unclear if the pathology was resolved at the time of the study) G2: 7 matched vocally healthy controls	Surface EMG (2-second moving average) of the thyrohyoid muscle on one side during several speech and non-speech tasks	Significant between-groups differences in absolute EMG amplitude were found at rest, during sustained vowel production, and during connected speech (MTD increased relative to controls, $p < .05$), but not during 50% contraction or maximal contraction Significant between-groups differences in EMG amplitude (vowel and speech) relative to 50% contraction and maximal contraction conditions (MTD increased relative to controls) ($p < .05$).
Van Houtte et al., 2013	Primary muscle tension dysphonia	History of vocal misuse/abuse (in specific contexts); extrinsic laryngeal muscle tension	G1: 18 patients with MTD-1 G2: 44 vocally healthy controls	Surface EMG (root mean square) of: 1) submental muscles (anterior belly of the	There were no significant differences in EMG activity between the MTD-1 group and the control group, for any of the muscle groups in any of the phonation tasks. There

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		detected on palpation (tightness, high larynx, reduced thyrohyoid space, focal tenderness); dysphonia severity index score below 1.6; one of more laryngeal features of MTD (posterior gap with decreased amplitude and symmetry of the mucosal waves, false vocal fold adduction, partial AP contraction, or complete squeeze of the supraglottis/ “sphinteric larynx”)		digastric, mylohyoid, and geniohyoid muscles; 2) infrahyoidal muscles (sternohyoid and omohyoid muscles); 3) sternocleidomastoidal muscles.	was no difference between the groups at rest. In both patients and healthy controls, there was a 2- to 3-fold increase in muscle activity from rest to phonation for most phonation tasks. The only difference was a larger increase in infrahyoidal muscle activity during reading in the control group ($p = .050$ and $p = .008$ for left and right, respectively).