

Supplemental Material S5. Inflammatory mechanisms: empirical studies.

Author(s), Year	Label	Criteria for MTD-1 diagnosis	Study groups	Assessment measures relevant to the inflammatory category	Main results for the inflammatory category
Angsuwarangsee & Morrison, 2002	Muscle misuse dysphonia (MMD)	“Absence of organic lesion or cause of dysphonia” “History of vocal misuse or abuse” “Demonstration of typical laryngoscopic pattern of MMD”	G1: 141 patients with MMD G2: 324 individuals with non-MMD (includes other laryngeal/voice disorders as well as healthy subjects)	-GERD status assessed via symptom report, posterior glottal redness, and positive 24-hour pH probe <i>Manual/Palpatory examination:</i> tension in suprahyoid (SH), thyrohyoid (TH), cricothyroid (CT), and inferior pharyngeal constrictor (PC) muscle groups (0–3 Likert scale)	TH, CT, and PC tension ratings: significant main effect of group (MMD vs non-MMD) ($p < .001$) TH and CT tension ratings: significant main effect of GERD status ($p < .01$) Age, sex, thyrohyoid tension, and GERD status were significant predictors of MMD diagnosis ($p = .0016$, $p = .0000$, $p = .0003$, $p = .0128$, respectively) Specific tension pattern most often seen in MMD patients was MMD3, which involves anteroposterior supraglottic compression. Subgroup analyses showed that significant differences in TH and GERD between MMD and non-MMD were driven by the MMD3 subgroup. Authors speculated that this TH tension is an adaptive, protective mechanism against GER.
Karkos et al., 2007	Functional dysphonia (FD)	Dysphonia > 3 months No puberphonia, SD, or visible organic lesions	G1: 22 patients with FD G2: 6 vocally healthy controls	24-hour dual-probe pH monitoring: -Number of reflux episodes -Number of reflux episodes > 5 minutes -Longest reflux episode (s)	<i>All results are relative to vocally healthy control group unless otherwise specified</i> <i>Inflammatory</i> Longest reflux episode: significant main effect of group ($p = .039$) at pharyngeal probe site while supine; no significant main effects of group ($p = .365$) at

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				<p>-Fraction of time with pH < 4 (%)</p> <p>Health questionnaires</p> <p>Quality of life:</p> <p>-Vocal Performance Questionnaire</p> <p>-Harmony I-684 Symptom and Lifestyle Questionnaire</p> <p>-General Health Questionnaire-12</p>	<p>pharyngeal probe site while upright; no significant main effects of group ($p = .604$) at esophageal probe site</p> <ul style="list-style-type: none"> FD group had significantly longer reflux episodes at pharyngeal probe site while supine <p>Fraction of time pH < 4: significant main effect of group ($p = .045$) at pharyngeal probe site while supine; no significant main effects of group ($p = .935$) at pharyngeal probe site while upright; no significant main effects of group ($p = .978$) at esophageal probe site</p> <ul style="list-style-type: none"> FD group had a significantly greater percent time with pH < 4 at pharyngeal probe site while supine <p>Number of reflux episodes: no significant main effect of group ($p = .764$, pharyngeal; $p = .460$, esophageal) at either probe site or in any position</p> <p>Number of reflux episodes > 5 minutes: no significant main effect of group ($p = .764$, pharyngeal; $p = .682$, esophageal) at either probe site or in any position</p> <p><i>Quality of Life</i></p>

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					<p>Vocal Performance Questionnaire: significant main effect of group ($p < .001$)</p> <ul style="list-style-type: none"> FD group had significantly lower scores (indicative of worse performance) <p>Harmony I-684: significant main effect of group ($p < .001$)</p> <ul style="list-style-type: none"> FD group had significantly higher scores (indicative of worse performance) <p>General Health Questionnaire: no significant main effect of group ($p = .065$)</p>
Koufman et al., 2000	Muscle tension dysphonia	Not specified	113 patients with laryngeal/voice disorders Subgroup of MTD patients ($n = 23$)	Prevalence of positive LPR diagnosis, as assessed by 24-hour dual pH probe (%)	<p>18 of 23 MTD patients (78%) had abnormal pH probe findings.</p> <p>In the overall sample, 73% of patients who got tested for reflux had an abnormal pH probe result (57/78).</p> <p>The overall prevalence of LPR in the total sample was 50%.</p> <p>No statistical analyses were conducted to compare different diagnosis groups.</p>
Van Houtte et al., 2012	Muscle tension dysphonia	Palpable tension of the (para)laryngeal musculature History of “vocal abuse/misuse” and psychologically stressful situations	G1: 14 patients with MTD G2: 14 vocally healthy controls	<p><i>Acoustic</i></p> <ul style="list-style-type: none"> -Jitter (%) -Shimmer (%) -Dysphonia Severity Index (DSI) <p><i>Aerodynamic</i></p> <ul style="list-style-type: none"> -Maximum phonation time (MPT, s) 	<p><i>All results relative to vocally healthy control group unless otherwise specified</i></p> <p><i>Acoustic</i></p> <p>Jitter, shimmer: no significant main effect of group for jitter ($p = .201$) or shimmer ($p = .571$)</p>

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		Anterior-posterior compression, lateral compression Dysphonia		<p>-Vital capacity (VC, cm³)</p> <p><i>Inflammatory</i></p> <p>-Reflux Severity Index</p> <p>-24-hour dual-channel pH probe</p> <p><i>Manometric</i></p> <p>-Upper esophageal sphincter pressure</p> <p><i>Quality of life</i></p> <p>-Dutch VHI-10</p> <p><i>Voice range profile (VRP)</i></p> <p>-Minimum intensity (dB)</p> <p>-Maximum intensity (dB)</p> <p>-Minimum F₀ (Hz)</p> <p>-Maximum F₀ (Hz)</p> <p>-Habitual F₀ (Hz)</p>	<p>Dysphonia Severity Index: significant main effect of group ($p < .001$): MTD group had significantly worse DSI scores</p> <p><i>Aerodynamic</i></p> <p>Maximum phonation time, vital capacity: no significant main effect of group for MPT ($p = .241$) or VC ($p = .605$)</p> <p><i>Inflammatory</i></p> <p>Reflux Severity Index, total score: significant main effect of group ($p < .001$): MTD group had significantly higher RSI scores</p> <p><i>Manometric</i></p> <p>Upper esophageal sphincter pressure: no significant main effect of group for any phonation condition</p> <p><i>Quality of Life</i></p> <p>Voice Handicap Index-10, total score: significant main effect of group ($p < .001$): MTD group had significantly higher VHI-10 scores</p> <p><i>Voice Range Profile</i></p> <p>Minimum intensity: significant main effect of group ($p = .015$): MTD group had significantly higher minimum intensity</p>

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					<p>Maximum intensity: significant main effect of group ($p = .030$): MTD group had significantly lower maximum intensity</p> <p>Minimum F_0: no significant main effect of group ($p = .675$)</p> <p>Maximum F_0: significant main effect of group ($p = .036$): MTD group had significantly lower maximum F_0</p> <p>Habitual F_0: no significant main effect of group for males ($p = .827$) or females ($p = .761$)</p>

Note. MMD = muscle misuse dysphonia; GERD = gastroesophageal reflux disease; SH = suprahoid; TH = thyrohyoid; CT = cricothyroid; PC = pharyngeal constrictor; FD = functional dysphonia; DSI = Dysphonia Severity Index; VC = vital capacity; VHI = Voice Handicap Index; F_0 = fundamental frequency.