

An Unusual Etiology of Vocal Tremor in a Professional Singer

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Summary: Vocal tremor is a neurologic disorder with myriad etiologies (eg, Parkinson disease, medications, or essential tremor). Vocal tremor can limit intelligibility and social interaction and can result in isolation in nonprofessional voice users. In a professional singer whose entire career is based on voice quality, onset of a vocal tremor is devastating. We report a case of sudden-onset vocal tremor that impeded a young professional singer's ability to perform and record her album. The etiology was determined to be a medication side effect of lamotrigine; a reaction that has not been previously reported. Diagnosis was based on perceptual assessment of the vocal tremor, laryngeal examination, and the singer's proximate history of lamotrigine dose adjustment. Two months after decreasing her dose, all symptoms resolved and the singer returned to her tour and performance schedule. To our knowledge, this is the first report of isolated vocal tremor as a side effect of lamotrigine and demonstrates that the voice may be more sensitive to this class of medication than previously described. It is incumbent on the vocal professional to inquire about and understand that new medication or dose changes may impact their voice.

Key Words: Vocal tremor—Laryngeal tremor—Singer—Lamotrigine—Medication side effects.

CASE REPORT

A healthy 36-year-old professional singer presented with a 4- to 5-month history of voice changes. She described reduction of her upper register, vocal inconsistency, imprecision, and increased effort with speaking and singing, as well as an unsteady quality described as “warbling.”

The patient had good laryngeal hygiene. Her history was notable for bipolar disorder, which had previously been treated with 150 mg of lamotrigine daily. However, because of a recent move and some significant personal stressors, her dose had been doubled to 300 mg daily 6 months before presentation.

The patient's physical examination was remarkable for anterior strap muscle recruitment and thyrohyoid space tenderness. Aside from her voice, she had no other neurologic abnormalities; specifically, she had no hand or head tremor. Perceptually, she was moderately dysphonic with consistent roughness, pitch instability, and a vocal tremor. Her videostroboscopy showed normal vocal fold mobility, no lesions, small bilateral sulci, normal vibratory parameters, and increased supraglottic hyperfunction at higher frequencies. The videostroboscopy also showed an unusually fast, multidirectional, laryngeal tremor in the vertical, anterior-posterior, and occasional horizontal directions.

The medication change was the suspected culprit. Thus, in collaboration with her psychiatrist, the lamotrigine dose was decreased to 150 mg. The patient was seen 2 months later during follow-up and her symptoms had completely resolved. She

was able to go back on tour and finish recording her album with no further issues.

DISCUSSION

Vocal tremor is characterized by nearly periodic modulations in pitch, loudness, or voicing that can have a major impact on intelligibility and quality of life. Pulmonary, laryngeal, velopharyngeal, and oral structures have all been implicated as causing vocal tremor with vertical laryngeal, true vocal fold, supraglottic structures and hypopharyngeal walls being the most commonly affected muscle groups.¹

Visualized rhythmic oscillation of the palate, pharynx, or vocal folds, along with perceptual analysis of the voice, is diagnostic of vocal tremor. There are no pathognomonic laboratory or radiological findings.² A comprehensive neurologic examination and evaluation by an experienced vocal professional are essential to distinguish vocal tremor from other related neurologic voice disorders, including parkinsonian tremor, myoclonus, tics, and spasmodic dysphonia.

This case highlights the need for a careful history with particular attention to what was happening at the time of symptom onset. Vocal tremor typically occurs in older women (Patel et al reported a mean age of 68.6 in their series³). Our patient's young age of 36 was markedly different from that of the typical patient. When presentation or symptoms differ from expected, further careful questioning is critical. It is also very important that medication be carefully reviewed with patients who have voice complaints. Many medications are known to cause voice changes through various mechanisms (eg, diuretics, exogenous hormone supplementation, and inhaled steroids), but it is equally important that clinicians be aware that many other medications may also have as yet undescribed associated side effects. Some medications, including adrenergic decongestants, have been implicated as a source of vocal tremor. A long list of medications includes tremor or movement disorder as a side effect,⁴ but none to our knowledge lists vocal tremor as a risk.

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In this case, the inciting medication was lamotrigine, which is a sodium channel-blocking antiepileptic drug. Lamotrigine also blocks calcium channels and may inhibit release of glutamate and has been postulated to have a GABAergic effect. It has a myriad of side effects cited as reasons for discontinuation, including rash, nausea and vomiting, fatigue, itching, enhanced mood, staggering, and lymph node swelling.⁵ Additionally, effects of long-term use of this drug in epileptic patients have been reported, including ataxia, headache, oculogyric crises, eye blinking and tic disorders, although these patients may have been on additional medications as well.^{6–8}

Additionally, lamotrigine is associated with movement disorder side effects. Specifically, action hand tremor and excessive eye blinking have been reported with lamotrigine.^{8,9} Lamotrigine has been associated with these types of tremor in 4% of patients vs 1% on placebo in add-on trials. However, no tremor association was noted in a placebo-controlled monotherapy trial.¹⁰ The mechanism of lamotrigine-induced tremor is unclear. The tremor may be related to the indirect influence of the dopaminergic system.⁸ Nonetheless, to our knowledge, voice effects have never been reported. It is interesting to note that this patient's symptoms resolved with dose reduction and not with cessation of the medication, which perhaps suggests a dose-response threshold for these types of neurologic side effects.

Another important takeaway is the frequency of the patient's tremor. The normative frequency of vocal tremor is thought to range from 3 to 10 Hz, although it has not yet been empirically measured.^{2,11–16} Perceptually, the patient's tremor seemed faster than what we typically have encountered in clinical practice. Her rate of tremor measured at approximately 7.5 Hz. Although this rate falls in the reported range, it has been our experience that this rate is fast compared with what we have observed. Empiric data measuring tremor frequency are needed to confirm that this patient is, indeed, an outlier.

However, our perception of the patient's tremor being faster than typical alerted us that perhaps this was a drug-induced tremor. Although there is a paucity of data on drug-induced vocal tremor, literature does exist in hand tremor where researchers have used the tremor frequency to differentiate drug-induced and resting tremor from Parkinson disease. Moreover, Nistico et al showed that whereas the amplitude of resting tremor was higher in patients with Parkinson disease, the frequency of the tremor was higher in drug-induced parkinsonism.¹⁷

To our knowledge, this is the first report of vocal tremor from lamotrigine and demonstrates that drug side effects should be considered in all patients presenting with voice changes. The associated vocal tremor was particularly obvious and devastating to this professional singer. This medication is

known to have significant neurologic side effects; however, vocal tremor has never been described.

CONCLUSION

This is the first report of a vocal tremor from lamotrigine. Subtle medication effects on the voice, which may go unnoticed by many patients, can be devastating to professional singers. As such, it is incumbent on the vocal professional to understand systemic issues that may affect the singer's voice. In this case, discerning perceptual analysis, as well as careful history taking, led to the identification of a previously unreported complication of medications. Further research should be undertaken to more precisely characterize vocal tremor, so outliers such as this patient can be more easily identified.

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