

Abstract

Objectives: Laryngospasm, chronic cough, and paradoxical vocal fold motion (PVFM) are distinct clinical conditions though current literature suggests interrelated clinical profiles and pathologic pathways. We studied initial assessments of patients who were eventually diagnosed with these conditions with the purpose of profiling their complaints and delineating clinical patterns.

Methods: The records of 37 patients presenting with choking, shortness of breath, and chronic cough were retrospectively reviewed. Data collected included age, gender, and duration of symptoms prior to presentation at an academic voice center. Initial Voice Handicap Index-10 (VHI-10), Reflux Symptom Index (RSI), Dyspnea Severity Index (DSI) and Cough Severity Index (CSI) data were compiled.

Results: Eleven of fourteen patients (3M;11F) with shortness of breath and reflective DSI scores (avg 23.1) were diagnosed with PVFM. This group had low RSI, CSI and VHI-10 scores. Of 13 patients with chronic cough (4M;9F), 8 were found to have vocal fold paresis, 3 had PVFM and 2 had laryngospasm. DSI scores were distinctly low, while other indices averaged 12-16. This group was the most divergent in initial clinical profile and eventual diagnosis. For patients with choking, RSI scores dominated and 7 of 10 patients (2M;8F) were diagnosed with laryngospasm, while 6 also had muscle tension dysphonia, and 5 had PVFM.

Conclusions: Our results emphasize the overlapping as well as the distinguishing presenting features of laryngospasm, PVFM and chronic cough, implicating possible common pathways with distinct manifestations. These similarities must be considered during diagnosis and treatment planning, and are a target for further study.

Introduction

Laryngospasm, chronic cough, and paradoxical vocal fold motion (PVFM) are distinct clinical conditions that all involve some degree and duration of disordered vocal fold adduction with overlapping manifestations, most commonly choking, airway obstruction/shortness of breath, stridor, globus, aphonia/dysphonia, and cough. [1] The triggers and underlying etiology of each entity are not fully elucidated. Misdiagnosis may lead to prolonged and frustrating symptoms, unnecessary medication, and delayed treatment.

Laryngospasm is defined as a sudden-onset, rapid, forceful and complete glottic closure leading to airway obstruction and apnea for up to 20 seconds. [2] Triggers for laryngospasm are variable, even among the same patients. The response to these noxious stimuli may be a result of abnormal laryngeal closure reflex. [1] PVFM is characterized by episodes of adduction of the vocal cords during inspiration, leading to reduced inspiratory flow. [1] It is more common in young females. The exact etiology is not known but PVFM is considered to be psychogenic in 70% of the cases and secondary to laryngeal hypersensitivity or other neurologic disorder in the remaining 30%. [3] Some of the manifestations of PVFM range from dyspnea, neck or throat tightness, chronic cough or inspiratory stridor, which mimic the symptoms of an asthma attack.

Chronic cough is one of the most common complaints during office visits. It has been defined as persistent cough for more than 8 weeks without improvement on medical management. [1] Gastroesophageal reflux disease (GERD) and/or laryngopharyngeal reflux (LPR) have been associated with chronic cough in up to 50% of the patients. However, even with treatment of the associated GERD/LPR, cough often persists. Although there is much overlap between laryngospasm, chronic cough and PVFM, each disease entity may present with distinct features. Profiling their complaints and delineating their clinical patterns may guide the treating physician in devising an unique treatment strategy for each patient.

Methods and Materials

A retrospective chart review was performed on 37 patients with chief complaints of choking, shortness of breath and chronic cough. Each patient underwent thorough history and physical examination, including videostroboscopy, after presenting to an academic voice center. Corresponding initial Voice Handicap Index-10 (VHI-10), Reflux Symptom Index (RSI), Dyspnea Severity Index (DSI) and Cough Severity Index (CSI) data, along with patient demographics (age, gender) and their duration of symptoms prior to presentation, were collected. The assessment scores were adjusted to a scale of 100 for accurate side to side comparisons.

Results

Eleven of fourteen (79%) patients with shortness of breath were diagnosed with PVFM. This group had highest DSI scores with low RSI, CSI and VHI-10 scores. Of 13 patients with chronic cough, 8 (62%) were found to have vocal fold paresis, 3 (23%) had PVFM and 2 (15%) had laryngospasm. The highest subjective assessment scale is CSI with a low DSI in this group. For patients presenting with choking, RSI scores dominated. Thirty-seven percent patients were diagnosed with laryngospasm, while 32% had muscle tension dysphonia, and 26% had PVFM as the primary diagnosis.

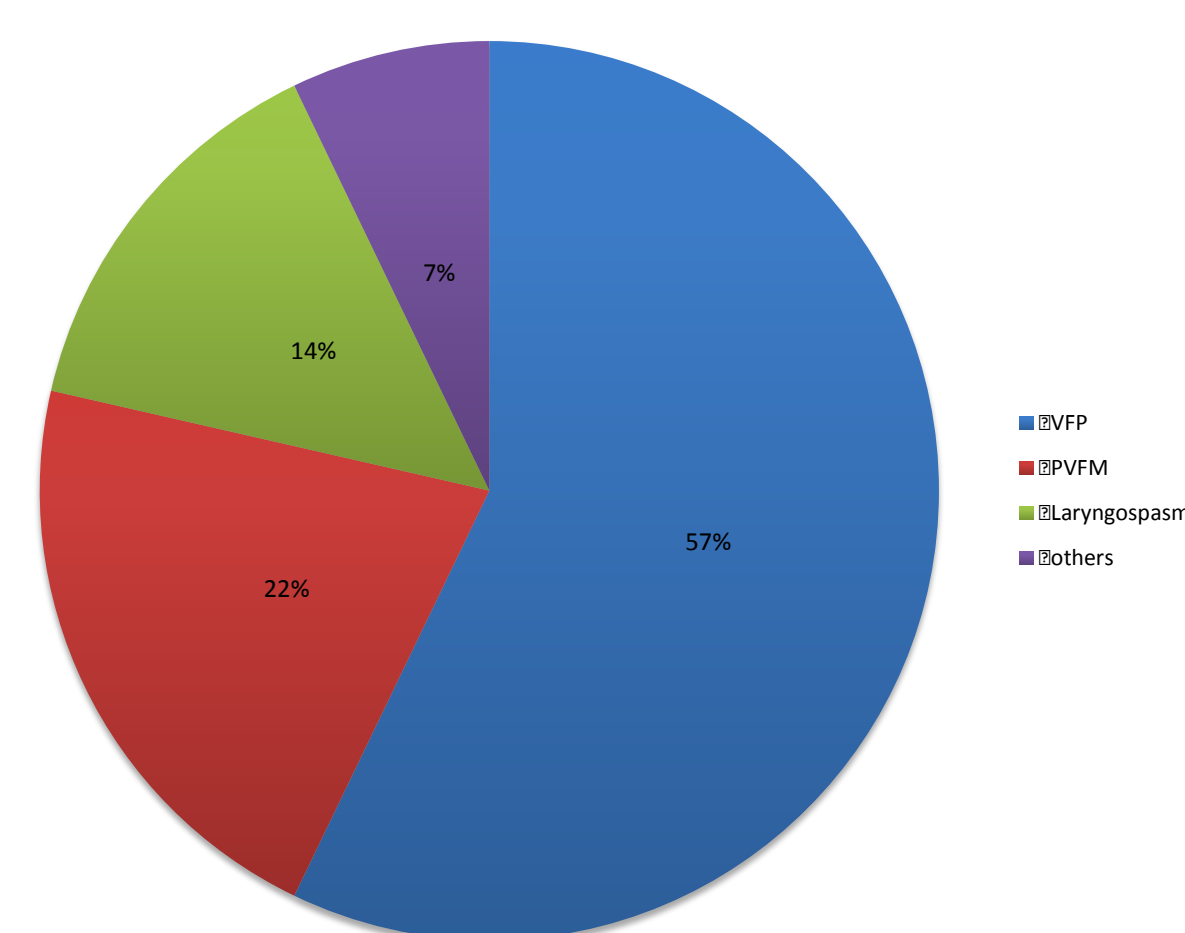


Figure 1. Chronic Cough Primary Diagnosis

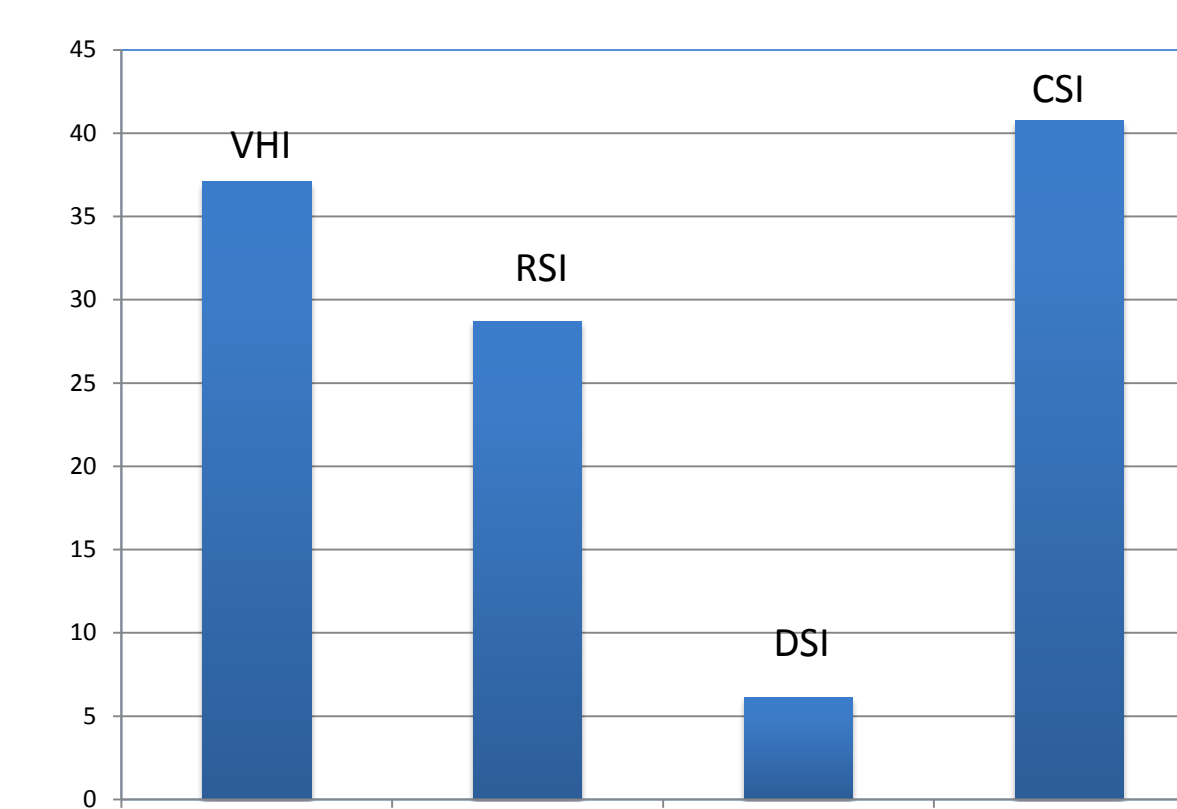


Chart 1. Chronic Cough

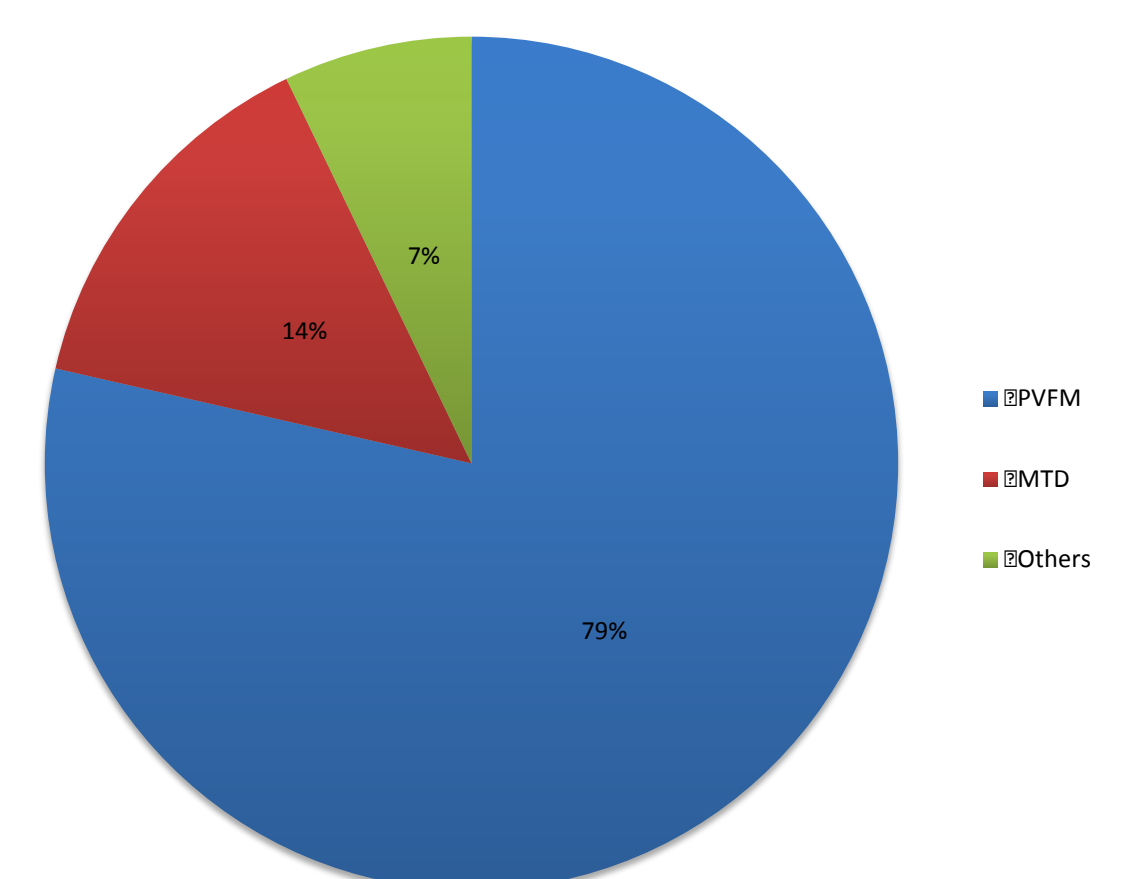


Figure 2. Shortness of Breath Primary Diagnosis

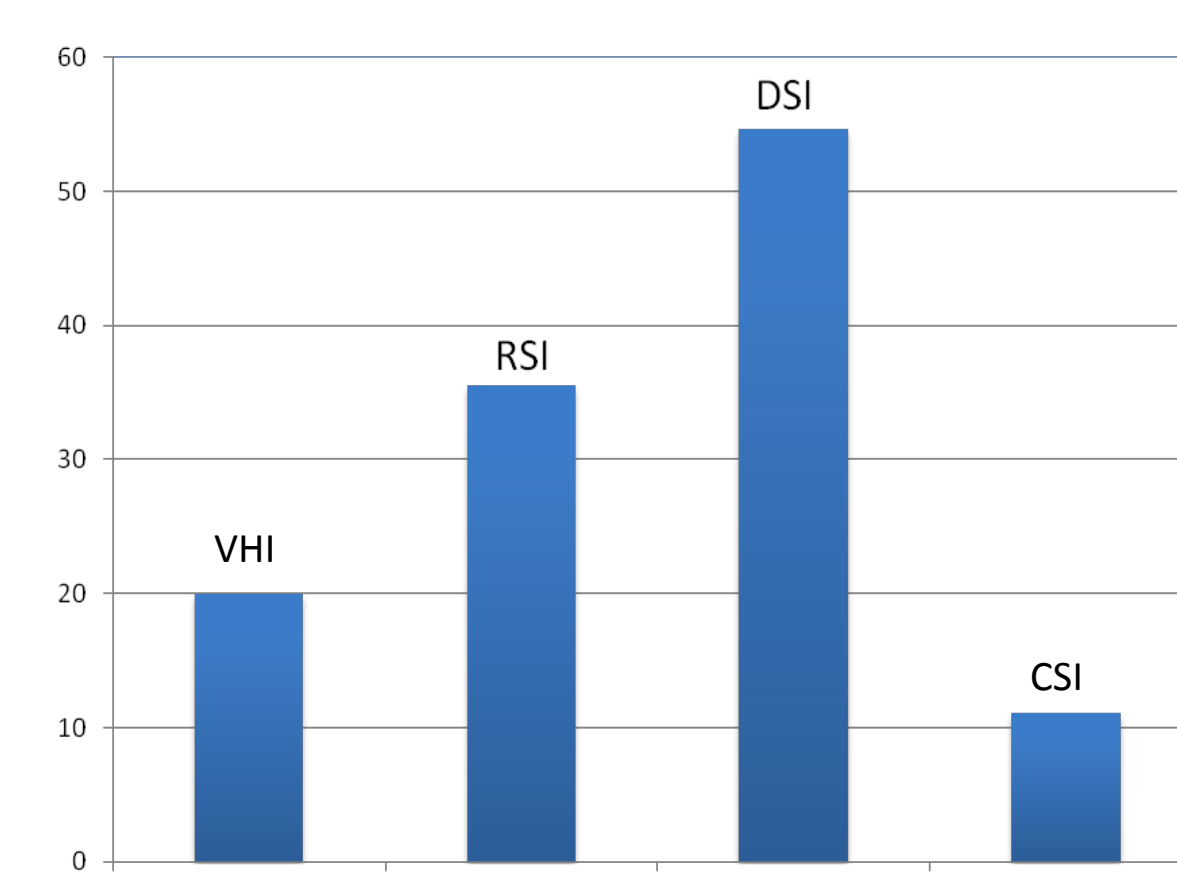


Chart 2. Shortness of Breath

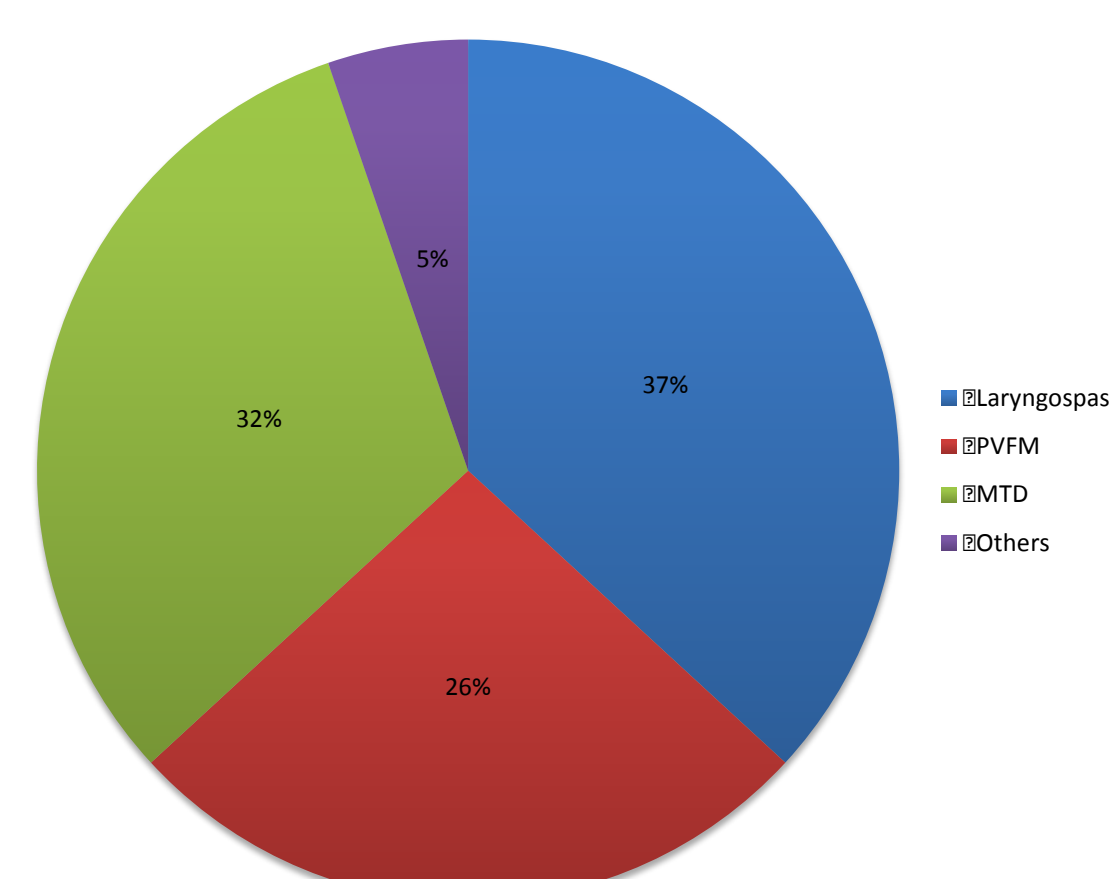


Figure 3. Choking Primary Diagnosis

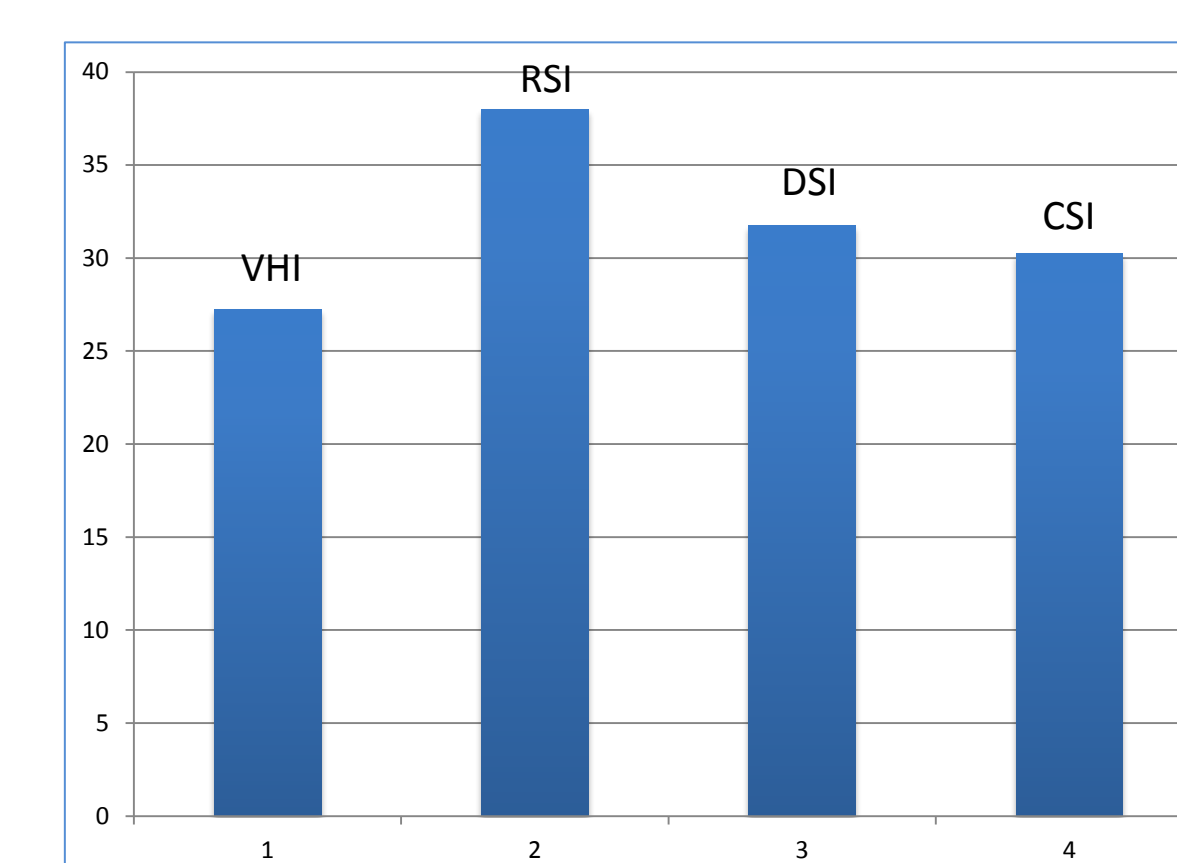


Chart 3. Choking

Discussion

Laryngospasm, chronic cough and PVFM are conditions that are challenging to distinguish due to their overlapping characteristics. This complicates their diagnosis. By the time they are seen by an otolaryngologist, many of these patients have been managed by multiple health care providers, from allergists, pulmonologists, and gastroenterologist to emergency room physicians. Their symptoms range from severe acute respiratory distress requiring emergent airway management to persistent paroxysmal cough refractory to medical therapies. Accurate diagnosis and an individualized treatment plan can help alleviate patient suffering.

The clinical overlap between these conditions at presentation suggest that they may have common pathological pathways. Morrison et al [5] investigated 39 patients with episodic laryngospasm, globus sensation, cough and/or muscle tension dysphonia and hypothesized that these patients fall into a common clinical syndrome, the irritable larynx syndrome. The clinical manifestations stem from repeated noxious stimuli to the larynx and appropriate laryngeal response, facilitating central nervous system adaptation with subsequent abnormally hypertonic response to all sensory input, even benign stimuli. Sensory neuropathy has been implicated specifically in the development of these hypersensitive neurologic relays. Lee et al [6] evaluated 28 patients with cryogenic cough, laryngospasm and/or throat clearing. Each patient underwent videostroboscopy and laryngeal electromyography. The authors correlated these symptoms with sensory neuropathy of the superior laryngeal nerve or recurrent laryngeal nerve in 71% of the patients.

In our patients, conditions such as chronic cough, laryngospasm and PVFM can be difficult to differentiate, due to their similar neurogenic origins. The treatment for each is different, and, for this reason, it is important to determine which condition is causing the patient's symptoms. Various patient reporting assessment scales, such as the VHI-10, RSI, DSI and CSI scores, have been shown to have high reliability and validity as outcome measures. [5] We found them to be essential tools in establishing the primary diagnosis and helping track subjective patient improvement on subsequent office visits. Our study demonstrated that among the 13 patients whose chief complaint was chronic cough, the most common primary diagnosis was vocal fold paresis (57%). Their highest average adjusted index score was CSI. This finding encourages us to consider targeting paresis in our treatment plan more readily for patients with chronic cough than in our other diagnostic groups, as found in our previous study[7]. For patients presenting with shortness of breath, the most common ultimate primary diagnosis was PVFM (79%) and they subjectively reported DSI scores that were higher than the other three indices. The choking group had laryngospasm as the most common primary diagnosis (37%), followed by muscle tension dysphonia (32%) and PVFM (26%). The highest average adjusted score was RSI. Therefore, obtaining subjective index scores, especially on multiple visits, can assist the laryngologist in determining the underlying primary diagnoses. Accurate diagnosis allows for the development of an appropriate and individualized treatment plan.

Conclusions

Laryngospasm, PVFM and chronic cough have overlapping yet distinct clinical features, implicating possible common pathways, one of which may be sensory neuropathy of the laryngeal nerves. These similarities must be considered during diagnosis and treatment planning, and are a target for further study.

Contact

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