

## Research Article

# Prevalence of Phonatory Symptoms and Impact on Quality of Life in Patients with Subacute Thyroiditis

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## Abstract

**Objective:** To study the prevalence of phonatory symptoms in patients with subacute thyroiditis and their impact on quality of life.

**Materials and Methods:** A total of 55 patients were recruited (22 with subacute thyroiditis and 33 controls). Data included: Age, gender, Allergy, smoking, disease duration, and thyroid function using their last TSH test. Subjects were asked about the presence or absence of the following symptoms: Hoarseness, vocal tiring or fatigue, vocal straining, lump sensation in the throat and aphonia or complete loss of voice. Patients filled out the Voice Handicap Index Ten (VHI-10) questionnaire and a cutoff of 7 was considered as indicative of a significant impact.

**Results:** The most common symptoms were vocal tiring or fatigue and lump sensation (40.9%) followed by aphonia (31.8%). Aphonia or loss of voice and vocal straining were statistically more prevalent in patients with thyroiditis compared to controls with p value of 0.022 and 0.033 respectively. 59% of patients had at least one vocal symptom compared to 51.5% in controls. The difference was not statistically different (p 0.58). In 13.6% of patients with thyroiditis, the presence of phonatory symptoms had a significant impact on quality of life (score above 7). Based on a bivariate analysis there was no correlation between phonatory symptoms and any of the variables, namely TSH level and duration of disease.

**Conclusion:** Patients with thyroiditis suffer significantly from vocal symptoms. In one out of five affected patients the impact of vocal symptoms on quality of life is significant.

**Keywords:** Thyroiditis; Phonatory symptoms; Thyroidectomy; Quality of life

## Introduction

Thyroiditis is defined as infiltration of the thyroid gland by inflammatory cells secondary to either an infective disease or an inflammatory process. The milieu of cytokines and inflammatory mediators initially causes nonspecific and unregulated release of thyroid hormones from the gland, manifesting as a state of hyperthyroidism. Later, the thyroid stress runs dry and the patient falls into a state of hypothyroidism. Such a hypo-secretory state can be reached directly if the inflammation involves antibody-mediated destruction of the hormone producing mechanism. As a result the thyroid gland is afflicted with a spectrum of diseases which affect its form and function [1,2]. Patients with subacute thyroiditis may present with thyroidal pain, tenderness and fever, which at times is a life threatening condition, whereas in the chronic form, as in autoimmune thyroiditis, patients may present with goiter and neck disfigurement with less of the symptoms of thyrotoxicosis. Associated symptoms of thyroiditis include weight loss, palpitations, and gastrointestinal symptoms such as dyspepsia, nausea and vomiting [3,4].

Very few reports have addressed phonatory symptoms in patients with thyroiditis. The most commonly reported symptoms are pressure sensation, hoarseness, and sudden onset of dysphonia [5-9]. Most of

these are sporadic case reports of patients presenting to the emergency room, or retrospective chart reviews of a large series of surgical patients, i.e., patients with thyroiditis undergoing thyroidectomies [10-13]. An extensive literature review failed to identify a prospective study that describes in a comprehensive manner the vocal symptoms and their impact on quality of life in a nonbiased group of patients with thyroiditis.

The purpose of this study is to look at the prevalence of phonatory symptoms in patients with subacute thyroiditis visiting the endocrinology clinic over a period of three months (June 2011-August 2011). The impact of the phonatory symptoms when present on quality of life and their correlation with the duration of the disease as well as the Thyroid Stimulating Hormone level is reported.

## Materials & Methods

A total of 55 patients were invited to participate in this study after having read the informed consent that was approved by the Institution Review Board. Twenty two patients were diagnosed with subacute thyroiditis by their primary endocrinologist and 33 were considered as controls. The diagnosis of subacute thyroiditis was based on the presence of a compilation of symptoms namely fever, tenderness in the neck, an ESR greater than 15 for men and greater than 20 for women [14] and a CRP greater than 10mg/L [15], and a

**Table 1:** Demographic Data.

	Patient	Control	p-value
<b>Age in years (mean ± SD)</b>	47.68 ± 10.78	38.55 ± 13.25	0.01
<b>Gender</b>			
Male	8 (36.4%)	19 (57.6%)	0.123
Female	14 (63.6%)	14 (42.4%)	
<b>Allergies</b>			
Absent	18 (81.8%)	30 (90.9%)	0.322
Present	4 (18.2%)	3 (9.1%)	
<b>Smoking</b>			
No	9 (50.0%)	20 (60.6%)	0.465
Yes	9 (50.0%)	13 (39.4%)	
<b>TSH*</b>		N/A	
Hyper-thyroid	4 (18.2%)		
Eu-thyroid	16 (72.7%)		
Hypo-thyroid	2 (9.1%)		

decrease in thyroid radioactive iodine uptake. Patients with recent history of respiratory tract infection and or laryngeal manipulation were excluded from the study.

Demographic data included: Age and gender, presence of allergy, history of smoking, duration of the disease, and their thyroid function using their last Thyroid Stimulating Hormone test (TSH). A range between 0.27 and 4.20 micro-unit/ml was considered as normal [16].

Subjects were asked about the presence hoarseness defined as an alteration in timbre, pitch or loudness, vocal fatigue, vocal straining as in having to exert effort to talk, globus sensation, and aphonia. Patients were also asked to fill out the Voice Handicap Index Ten (VHI-10) questionnaire. The authors of this manuscript have elected to use this questionnaire because of its validity, reliability and ease of usage [17]. A cutoff of 7 was considered as indicative of a significant impact.

Descriptive analysis was used to report on the Frequencies and means (± standard deviation) of continuous variables, respectively. At the bivariate level, the *independent t-test* was used to determine any significant differences in means of each continuous variable at the bivariate level when compared in the presence or absence of any phonation symptom. The *Pearson chi square test* was used to assess the correlation between phonatory symptoms and subacute thyroiditis. When expected count cells were less than 5, Fisher’s exact test was applied instead of Pearson’s chi square. All analyses were conducted using the Statistical Package for the Social Sciences version 17 software package. A two-tailed p value of less than 0.05 was considered statistically significant.

## Results

### Demographic data

The mean age of patients with thyroiditis was 47.68 + 10.78 years. Sixty three per cent were females and 36% males. Eighteen per cent had history of allergy and 50% were smokers. At the time of examination, 18.2% were hypothyroid, 9.1% were hyperthyroid and 72.7% were euthyroid (Table 1).

### Phonatory symptoms and impact on quality of life

The most common symptoms were vocal tiring or fatigue and lump sensation (40.9%) followed by aphonia (31.8%). Aphonia or loss of voice and vocal straining were statistically more prevalent in patients with thyroiditis compared to controls with p value of 0.022 and 0.033 respectively. Fifty nine per cent of patients had at least one

**Table 2:** Prevalence of Phonation symptoms among patients and controls.

	Patients	Controls	P-value
<b>Hoarseness</b>	5 (22.7%)	5 (15.2%)	0.498
<b>Vocal tiring or fatigue</b>	9 (40.9%)	9 (27.3%)	0.291
<b>Vocal straining</b>	5 (22.7%)	1 (3.0%)	0.033*
<b>Lump sensation</b>	9 (40.9%)	11 (33.3%)	0.567
<b>Aphonia or loss of voice</b>	7 (31.8%)	2 (6.1%)	0.022*

\*significant results (p-value<0.05)

vocal symptom compared to 51.5% in controls. The difference was not statistically different (p value= 0.58) (Table 2).

In 13.6% of patients with thyroiditis, the presence of phonatory symptoms had a significant impact on quality of life (score above 7) whereas in the control group only 9.7% had a significant impact (p value= 1.000) (Table 3).

### Correlation between phonatory symptoms TSH level and duration of disease

Based on a bivariate analysis there was no correlation between phonatory symptoms and TSH level and duration of disease (Table 4).

## Discussion

The literature is ubiquitous on the clinical presentation of patients with subacute thyroiditis. Irrespective of the etiology, the symptoms may spread from non-specific complaints as in fever and vomiting, to life threatening thyrotoxicosis with palpitations and respiratory discomfort [18,19]. Very few are the reports describing the phonatory complaints in patients with thyroiditis without being biased in their subject selection. By biased we mean reporting on patients who presented to the emergency room or underwent surgery. More so, most of these are either case reports or studies retrospective in nature based on chart review. Lindman et al. described pressure symptoms in 21 out of 41 patients with Hashimoto’s thyroiditis, in his report on indications for surgery in patients with thyroiditis [20]. Tsunoda et al. has also described a case of Hashimoto’s thyroiditis presenting with severe pressure symptoms that were alleviated after surgery [21]. Similarly Rowe-Jones JM in 1993 described vocal cord paralysis in patients with benign lesions of thyroid gland among which were patients with thyroiditis [6]. Several case reports on vocal cord paralysis as a complication of acute or subacute thyroiditis have also been described [5,7]. Volpe and Johnston have reported hoarseness in eight patients out of 56 cases of subacute thyroiditis with no report on the laryngoscopic findings [8]. Rogerio et al. reported a case of sudden onset of dysphonia in a patient with subacute thyroiditis. The vocal symptom was due to vocal cord paralysis that recovered after steroid treatment [9]. In a study by Caroline M et al looking at the predictors of postoperative laryngeal nerve paresis using laryngeal EMG in patients undergoing thyroid surgery, only patients with thyroiditis alone improved postoperatively. In this study 42% of the total 17 patients had vocal symptoms pre-op [10]. This was a retrospective

**Table 3:** Vocal Handicap Index among patients and controls.

		Patients	Controls	P-value
<b>Vocal Handicap Index</b>	<7	19 (86.4%)	28 (90.3%)	0.683
	≥7	3 (13.6%)	3 (9.7%)	

**Table 4:** Bivariate analysis of each of the phonation symptoms with the different variables.

Variables	Hoarseness	Vocal tiring or fatigue	Vocal straining	Lump sensation	Aphonia or loss of voice
TSH	$p=0.297$	$p=0.184$	$p=0.297$	$p=0.868$	$p=0.146$

\*significant results ( $p$ -value<0.05)

chart review of surgical patients. Similarly in a study by MacManus et al. on the benefits of thyroidectomy in patients with Hashimoto's thyroiditis, improvement in vocal symptoms was present in 77% of 133 patients with thyroiditis pre-operatively [11]. In a study by Barr A et al. on the clinical and electromyographic presentation of patients with dysphonia and vocal cord paresis, 31.8% of the 22 patients had thyroiditis [13].

In our study group of 22 patients diagnosed with subacute thyroiditis who were elective cases referred from the endocrinology clinic, close to 60% had at least one vocal symptom. The most common vocal symptoms were lump sensation and vocal tiring or fatigue, followed by aphonia, hoarseness and straining. These symptoms did not correlate with the TSH level or duration of the disease, indicating that most likely they are not due to a hyperthyroid condition or myxedematous changes that can occur in patients with hypothyroidism. There are many suggested mechanisms for the pathophysiology of vocal tiring and fatigue which ultimately can lead or be accompanied by straining. These include changes in the rheological properties of the vocal cords, viscoelastic properties, neuromuscular fatigue, and respiratory fatigue [22]. Other possible etiological factor for the vocal fatigue and straining is vocal cord paresis or paralysis which has been reported by many authors in their description of vocal symptoms in patients with thyroiditis [10-13]. This entity is hard to rule out with the lack of endoscopic examination in our subjects and knowing that 30% of patients with vocal cord paralysis may be asymptomatic [23]. Impaired mobility of the vocal cord in patients with thyroiditis is a very plausible mechanism for the vocal symptoms of fatigue and straining. Several etiologies for vocal cord paralysis in patients with thyroid disease have been listed in the literature [5-7,9]. These include mechanical impairment, toxicity, metabolic changes, inflammatory and idiopathic. Stretching of the recurrent laryngeal nerve due to enlargement or hyperplasia of the gland, pressure on the nerve, spread of an acute inflammatory process and its mediators to the nerve, perineural fibrosis secondary to chronic inflammation, and last but not least is thrombosis of the recurrent laryngeal nerve vessels are suggested mechanisms.

Patients with thyroiditis may have a reduced quality of life in view of the clinical presentation of their disease. Thyroid hormones play an essential role in the development of the human brain. Deviations from the euthyroid state have grave clinical consequences ranging from lethargy, poor motor coordination to memory impairment [24,25]. These symptoms alter patients' perception of the quality of their lives (QoL) socially and personally. The resolution of this feeling of disempowerment following treatment has been documented by some and refuted by others [26,27].

The Voice Handicap Index (VHI) is a questionnaire proposed by Jacobson et al in 1997 to assess the voice handicap of a patient [28]. By handicap we mean the social, economic, or environmental disadvantage resulting from impairment. With respect to voice, it reflects a subjective measurement of the impact of a voice disorder on a patient's life. The VHI has been validated and met the criteria

for reliability, validity and availability of normative data [29]. In 2004, a more concise version, the Voice Handicap Index-10 has been described by Rosen et al. This questionnaire includes 10 statements from the 30-item VHI form [30]. The normative data for VHI-10 has been reported to be below 7 and any score above 7 is considered as abnormal. In our study, 13.6% of patients with thyroiditis had a score above 7 indicating a significant impact of their voice disorder on their quality of life, compared to only 9.7% in controls.

Our study has two limitations: One is the limited number of participants and second is the lack of laryngeal endoscopic examination. This later would reveal cord mobility on patients with subacute thyroiditis, a finding that would help in understanding the mechanism of many of the phonatory symptoms in affected patients.

## Conclusion

Patients with subacute thyroiditis suffer significantly from vocal symptoms. In one out of seven affected patients the impact of vocal symptoms on quality of life is significant. The primary caring physician should be alert to changes in voice quality in patients with thyroiditis and caring measures such as laryngeal endoscopic examination and therapy are warranted.

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