

Descriptive Epidemiology of Voice Disorders in Rheumatoid Arthritis: Prevalence, Risk Factors, and Quality of Life Burden

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Summary: Objectives. Rheumatoid arthritis (RA) is an autoimmune inflammatory disease which may adversely affect phonatory function. This study aimed to establish the prevalence, risks, and quality of life effects of voice disorders in RA.

Study Design. This is a cross-sectional, descriptive epidemiology study.

Methods. One hundred individuals with RA underwent a telephone interview to determine the frequency, severity, risks associated with, and quality of life burden of voice disorders. The results were analyzed using summary statistics, frequencies, chi-square tests, regression analysis, and risk ratios ($P < 0.05$).

Results. Thirty-five percent of participants with RA reported a current voice disorder which was chronic and long-standing in most cases. The prevalence of a current voice disorder did not significantly differ across age, sex, medication use, voice use patterns, medical history, or RA severity. These chronic voice disorders produced significant adverse effects on both voice-related quality of life and short form 36 health-related quality of life scales. Specific voice symptoms such as “voice-related discomfort” and “chronic throat dryness” contributed disproportionately to the quality of life burden. Of those participants with a voice disorder, only 37% had ever sought professional help to improve their voice.

Conclusions. These results indicate that voice disorders are common in RA and produce significant adverse effects on quality of life. Further research is necessary to better understand the origin of these disorders and their potential response to treatment.

Key Words: Voice disorders—Epidemiology—Rheumatoid arthritis—Quality of life.

INTRODUCTION

Autoimmune diseases are associated with the body's inappropriate defense against its own healthy tissue. Rheumatoid arthritis (RA) is a chronic, disabling, autoimmune condition of unknown cause, characterized by inflammation of synovial joint tissue. Joints commonly affected in RA include the hands, feet, ankles, and wrists, but any joint may be involved, including within the larynx.^{1,2} RA affects approximately 2–3% of the adult population,^{3,4} and women are more than twice as likely as men to develop the disease.¹ Although the average age of onset is 55 years, the prevalence of RA increases with age, affecting 6% of white adults over age 65.³

RA within the larynx may produce voice problems; however, the true prevalence of such disorders and their burden on quality of life remains undetermined.^{4–9} Laryngeal signs of RA reportedly include “bamboo” nodules and cricoarytenoid joint fixation with dysphonia and stridor. Bamboo nodules are bilateral, yellow, midmembranous vocal fold swellings that have a calloused appearance and may occur in as many as 25% of individuals with RA.^{4,10–13} Stridor occurs presumably because

of fixation of the vocal folds via the cricoarytenoid joint, with upper airway obstruction reportedly occurring in 16% of patients.^{2,14–16} In addition to these laryngeal changes, many patients with RA report feeling a foreign body sensation in the throat, dysphagia, pain with speaking, and vocal fatigue.^{2,14,15,17}

Table 1 summarizes the extant literature examining laryngeal/voice involvement in RA. Inspection of Table 1 reveals considerable variability regarding the prevalence of laryngeal signs and phonatory symptoms in RA. Some of these discrepancies are related to inconsistent criteria of what precisely constitutes a “voice disorder,” methodological differences related to sampling procedures, and sample populations and sizes, among other issues. For instance, some studies relied exclusively on visual inspection of the larynx and reported a very high prevalence of laryngeal changes (ie, 80%) in patients with RA,^{22,23} whereas Lofgren and Montgomery¹⁸ reported laryngeal involvement in only 26% of participants on the basis of patient histories and extralaryngeal palpation, in addition to indirect laryngoscopy. Lawry et al²⁴ compared indirect laryngoscopy versus computed tomography and documented laryngeal manifestations of RA in 32% and 54% of participants, respectively. More recently, investigators have used the voice handicap index (VHI)²⁵ and other self-report methodologies to establish the presence of a voice disorder and reported prevalence rates in RA ranging from 5% to 48%.^{6,7,9,19,20} Although RA has the potential to adversely affect phonatory function, it is clear from the previously described review that significant disagreement exists regarding (1) the prevalence of voice disorders in RA, (2) patterns and symptoms of voice disorders in RA, (3) risk factors associated with these disorders, and (4) the consequences of voice disorders and their associated symptoms on social, physical, and emotional

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TABLE 1.
Studies Examining Voice Dysfunction in RA

Study	# of Subjects	Gender Represented	Age (y)	Method	Findings
"Incidence of laryngeal involvement in rheumatoid arthritis" Lofgren and Montgomery ¹⁸	100 participants with RA	68 women, 32 men	N/A	External palpation and indirect laryngoscopy.	26% of RA participants examined were found to have involvement of cricoarytenoid joint.
"Rheumatoid nodules of the larynx" Woo et al ⁴	64-year-old woman	One woman with RA	64 y	Flexible laryngoscopic examination; laryngostroboscopy to assess vibratory function; microdirect laryngoscopy; and evacuation of subcordal masses from each vocal fold.	Rheumatoid nodules can affect the vocal folds, which causes hoarseness or dysphonia; RA in the larynx is found in as many as 25% of RA participants.
"Airway obstruction and rheumatoid arthritis" Vergnenegre et al ¹⁵	100 participants with RA, 88 participants with other rheumatological diseases	77 women, 23 men in RA group and 67 women, 21 men in control group	RA group = 60 ± 12 y control group = 57 ± 21 y	Questionnaire, spirometric measurements taken, chest radiograph.	Number of obstructive syndromes was higher in participants with RA than other rheumatologic conditions.
"Arytenoid adduction to treat impaired adduction of the vocal fold due to rheumatoid arthritis" Kumai et al ¹⁶	1 woman with RA	1 woman	57-year-old with 10-year history of RA	Arytenoid adduction surgery performed to normalize voice.	In cases of bilateral cricoarytenoid joint involvement in RA, airway obstruction can occur.
"Prevalence of subjective voice impairment in rheumatoid arthritis" Fisher et al ⁵	73 with RA 73 controls	N/A	N/A	VHI-10 and reflux symptom index to assess symptomatology of laryngopharyngeal reflux; Participants with RA had a joint assessment, erythrocyte sedimentation rate (ESR), and visual analog to calculate disease activity score (DAS).	Findings suggest a prevalence of voice impairment of 5% based on VHI-10 score >15.
"Prevalence and relative risk of dysphonia in rheumatoid arthritis" Speyer et al ⁹	166 RA 148 control	47 men, 119 women	19–89 y, Mean age = 61	Visual analog scale of severity by rheumatologist and patient; VHI and three-item outcome scale on perception of impairment.	Prevalence of voice disorders 15% in RA participants, compared with 6% in controls based on VHI >15. RA 2.9–3.7 times more likely to have dysphonia.

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