

LARYNGOPHARYNGEAL REFLUX: CURRENT CONCEPTS IN PATHOGENESIS, DIAGNOSIS, AND MANAGEMENT IN OTORHINOLARYNGOLOGY

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Abstract

Laryngopharyngeal reflux (LPR) is a common disorder encountered in otorhinolaryngology characterized by the retrograde flow of gastric contents into the larynx, pharynx, and upper aerodigestive tract. Unlike gastroesophageal reflux disease (GERD), laryngopharyngeal reflux often occurs without classic symptoms such as heartburn and regurgitation, making diagnosis particularly challenging. Chronic exposure of the upper airway mucosa to gastric acid, pepsin, bile salts, and digestive enzymes leads to inflammation, mucosal injury, and functional impairment of laryngeal structures. Patients frequently present with chronic cough, hoarseness, throat clearing, globus sensation, dysphagia, and voice disturbances. If left untreated, laryngopharyngeal reflux may contribute to chronic laryngitis, vocal fold pathology, airway stenosis, and reduced quality of life. Recent advances in diagnostic technologies and therapeutic strategies have improved disease recognition and management. This article reviews current evidence regarding epidemiology, pathophysiology, clinical manifestations, diagnostic approaches, treatment options, and preventive measures related to laryngopharyngeal reflux.

Keywords: Laryngopharyngeal reflux, reflux laryngitis, chronic cough, hoarseness, voice disorders, proton pump inhibitors, pepsin, otorhinolaryngology, upper airway inflammation.

1. Introduction

Laryngopharyngeal reflux is increasingly recognized as an important cause of chronic upper airway symptoms and voice disorders. The condition results from the abnormal reflux of gastric contents beyond the upper esophageal sphincter into the pharynx and larynx. Unlike the esophageal mucosa, which possesses several protective mechanisms against acid exposure, the laryngeal and pharyngeal mucosa are highly sensitive and vulnerable to even brief episodes of reflux. The prevalence of laryngopharyngeal reflux has increased considerably over recent decades and is estimated to account for approximately 10–20% of consultations in otorhinolaryngology clinics. However, the true prevalence remains uncertain because symptoms are often nonspecific and overlap with numerous other conditions, including allergies, chronic rhinosinusitis, asthma, vocal overuse, and

infectious diseases.

The pathogenesis of LPR is multifactorial. Direct mucosal injury occurs when gastric acid, pepsin, and bile salts contact laryngeal tissues. Pepsin, in particular, plays a significant role because it remains biologically active within laryngeal cells even after reflux episodes have ended. In addition to direct tissue damage, reflux may trigger vagally mediated reflexes leading to chronic cough, throat irritation, and laryngeal hypersensitivity.

Risk factors associated with LPR include obesity, dietary habits, smoking, alcohol consumption, stress, hiatal hernia, sleep disorders, and increased intra-abdominal pressure. Occupational voice use may further exacerbate symptoms and contribute to chronic laryngeal inflammation.

The clinical significance of laryngopharyngeal reflux extends beyond symptom burden. Persistent mucosal injury may predispose individuals to chronic laryngitis, granuloma formation, vocal fold edema, subglottic stenosis, and potentially malignant mucosal alterations. Therefore, early diagnosis and effective management are essential for preventing long-term complications and preserving vocal function.

2. Materials and Methods

This study was conducted through a comprehensive review of scientific literature addressing laryngopharyngeal reflux and its clinical management. Relevant publications were identified using electronic databases including PubMed, Scopus, Web of Science, Embase, and Google Scholar.

The review included randomized controlled trials, prospective and retrospective studies, systematic reviews, meta-analyses, and international consensus statements published between 2010 and 2025. Studies examining epidemiology, pathophysiology, risk factors, diagnostic methods, treatment outcomes, and preventive strategies were selected for detailed evaluation.

Data extraction focused on patient demographics, symptom profiles, laryngoscopic findings, diagnostic accuracy, therapeutic effectiveness, quality-of-life outcomes, and recurrence rates.

Comparative analyses were performed to assess the strengths and limitations of different diagnostic and treatment approaches.

Studies lacking methodological quality, sufficient sample size, or clinical relevance were excluded.

Information obtained from selected publications was synthesized to provide an evidence-based overview of current concepts in laryngopharyngeal reflux.

3. Results

The literature review demonstrated that laryngopharyngeal reflux affects individuals of various age groups but occurs most frequently among middle-aged adults. A slight predominance was observed among patients with obesity, sedentary lifestyles, and diets rich in fatty or acidic foods.

The most commonly reported symptoms included chronic throat clearing, persistent cough, hoarseness, globus pharyngeus, excessive mucus production, dysphagia, throat discomfort, and vocal fatigue. Notably, a substantial proportion of patients lacked classic gastroesophageal reflux symptoms, complicating clinical diagnosis.

Flexible fiberoptic laryngoscopy emerged as one of the most valuable diagnostic tools. Common findings included posterior laryngeal erythema, interarytenoid edema, vocal fold swelling, ventricular obliteration, and diffuse laryngeal inflammation. However, these findings were not entirely specific and could be observed in other inflammatory conditions.

The Reflux Symptom Index (RSI) and Reflux Finding Score (RFS) demonstrated utility in clinical assessment and treatment monitoring. Multichannel intraluminal impedance-pH monitoring was identified as the most accurate diagnostic method for detecting both acidic and non-acidic reflux episodes affecting the upper aerodigestive tract.

Lifestyle modification consistently showed significant therapeutic benefits. Dietary changes, weight reduction, smoking cessation, alcohol avoidance, and elevation of the head during sleep contributed to symptom improvement in many patients.

Proton pump inhibitors remained the most frequently prescribed pharmacological agents. Numerous studies reported reductions in symptom severity following treatment, although outcomes varied considerably among patients. Additional therapeutic options included alginates, H₂ receptor antagonists, and mucosal protective agents.

Voice therapy provided beneficial outcomes in patients with concomitant vocal misuse and chronic

laryngeal irritation. Combined medical and behavioral interventions generally produced superior results compared with isolated treatment modalities.

4. Discussion

The findings of this review highlight the complex nature of laryngopharyngeal reflux and the challenges associated with accurate diagnosis. Unlike gastroesophageal reflux disease, LPR often presents with extraesophageal manifestations that may mimic numerous otorhinolaryngological disorders.

The role of pepsin in disease pathogenesis has gained increasing attention. Research demonstrates that pepsin may remain active within laryngeal tissues and continue causing cellular injury even in non-acidic environments. This observation helps explain why some patients experience persistent symptoms despite acid suppression therapy.

Diagnostic uncertainty remains a major challenge. While laryngoscopic findings and symptom questionnaires are useful screening tools, definitive diagnosis frequently requires objective reflux testing. Advances in impedance-pH monitoring have improved the ability to identify reflux episodes and characterize their composition.

Lifestyle factors play a substantial role in disease development and progression. Diets high in fat, caffeine, carbonated beverages, and processed foods increase reflux risk and symptom severity. Consequently, non-pharmacological interventions should be considered fundamental components of comprehensive treatment plans.

The effectiveness of proton pump inhibitors remains a topic of ongoing debate. Although many patients experience symptom relief, others show limited response, suggesting that non-acid reflux, laryngeal hypersensitivity, and alternative mechanisms may contribute to symptom persistence. Personalized treatment approaches based on objective diagnostic findings may therefore improve outcomes.

Future research should focus on developing reliable biomarkers, refining diagnostic criteria, and investigating novel therapeutic agents targeting pepsin activity, mucosal protection, and inflammatory pathways. Precision medicine approaches may facilitate more effective management of this heterogeneous condition.

5. Conclusion

Laryngopharyngeal reflux is a prevalent and clinically significant disorder affecting the upper aerodigestive tract. The condition results from exposure of laryngeal and pharyngeal tissues to gastric contents, leading to chronic inflammation and functional impairment. Clinical manifestations are often nonspecific and include chronic cough, throat clearing, hoarseness, globus sensation, and dysphagia. Accurate diagnosis requires careful clinical evaluation, laryngoscopic assessment, and, when necessary, objective reflux monitoring. Lifestyle modification, dietary management, pharmacological therapy, and voice rehabilitation constitute the foundation of treatment. Early recognition and individualized management are essential for preventing complications, improving quality of life, and preserving laryngeal function. Continued research will further enhance understanding and treatment of this increasingly recognized disorder.

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