1. Definition
Laryngopharyngeal reflux (LPR) is the backflow of gastric contents to the laryngopharynx where it comes in contact with tissues of the upper aerodigestive tract. The relationship with Gastro-esophageal reflux disease (GERD) is complicated as both may appear to be the result of acid reflux but some individuals develop one syndrome or the other, or both. The explicit relationship between these two syndrome is unknown.

2. Epidemiology
8 to 20% of the general population, 4% to 10% of patients in the ENT consultation, 1% of patients in primary care practice. This clinical entity is known to considerably affect:
- Patients quality of life as reducing the speaker’s communicative effectiveness, LPR would concern to 50 to 78% of population with voice complaints
- Sleep and daily activities

 Aim: To study the current literature about i) the changes of speech behavior, ii) the impact of a medical treatment with or without speech therapy or surgery.

1. Models
- The direct effect of the gastric content reflux on the laryngopharyngeal mucosa involves several irritants present in the reflux such as acid, pepsin, tryptoan, bile salts, bacteria, food proteins, and others gastro-duodenal proteins.
- Effect of gas refluxes since hydrochloric acid can easily form an acid concentrated cloud entering the airways.
- The indirect effect of the gastric content reflux: chemoceptor stimulation resulting from refluxed material from the stomach in the distal portion of esophagus, with vagal reflexes followed by coughing and throat clearing.

2. Clinical findings

Pathophysiology and clinical findings

<table>
<thead>
<tr>
<th>Macron Accumulation</th>
<th>Postnasal Drip Sensation</th>
<th>Throat Clearing</th>
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<td>Hoarseness 95%</td>
<td>Cough</td>
<td>Choking</td>
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<td>Glomus 95%</td>
<td>Sore throat and throat clearing 96%</td>
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<td>Persistent cough 97%</td>
<td>Posterior commissure hypertrophy: 89%</td>
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<td>Diffuse laryngeal edema 77%</td>
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<td>Contact granuloma 74%</td>
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Vocal manifestations
- Hoarseness concerns nearly 30% in American adult population, 50% in elderly patients and 3.9% to 23% in children.
- The major etiologic factor for hoarseness of more than 3 months duration remains LPR.
- Many patients also reported abnormal perceptual voice characteristics such as musculoskeletal tension, hard glottal attack, glottal fry, vocal forcing, forcing sensations, clamping, vocal fatigue, prolonged voice warm-up time, and restricted tone placement.

Differences with GERD
- Participants with severe GERD had significantly higher LPR scores compared to those with mild, moderate, or inactive disease.
- GERD patients often have dysmotility and prolonged acid clearance unlike LPR patients.
- Episodes of GERD occur at night and lying. LPR reflux episodes occur upright and daytime (gases).
- 23% of patients with confirmed LPR have normal levels of acid exposure in the distal oesophagus.
- Heartburn and dyspepsia, classical symptoms in GERD, are absent in more than 50% LPR patients compared with patients suffering from a classic GERD where 98% have heartburn.
- In 12-18% cases, patients suffering from LPR have oesophagitis and Barrett’s metaplasia in 3-7%.

Diagnosis
1. 24-hour double-probe ambulatory pHmetry
   - Daytime and night time pHmetry in the distal portion of the esophagus and the hypopharynx.
   - The normal values for the test could not be definitely established given the worry of carrying out this test in a large number of normal volunteers. 52% healthy subjects have LPR episodes with a cut-off set to 2 episodes per day.
2. RSI, LPR, and RFS.
   - Exclude all confounding diseases (i.e. active allergy, laryngeal infection, a large alcohol consumption and/or smoking, and other causes of laryngitis).
   - Good alternatives to pHmetry or Restrach.

Treatment
1. Diet behavioral changes
   - The most important part of treatment (mild and moderate LPR).
   - Lose overweight, reduce daily caloric intake, practice physical activity, sleep with the head of bed elevated, and change alimentary habits.
2. Medical treatment
   - PPIs for 3 to 6 months: RCT controversy.
   - Confirmation of the diagnosis.
3. Surgery
   - Restrict prove the impact of the lower esophagus sphincter.
   - Option for i) resistant LPR, ii) symptomatic non-acid reflux, iii) not achieve adequate acid suppression even on high doses of PPIs, iv) individuals who prefer avoidance of long-term use of medication.
4. Speech therapy
   - Improve subjective and objective assessments after 3 months.
   - Restore reversible mucosal damages.

Future Research
1. Pathophysiology
   - More studies are needed to clarify the involvement of every pathophysiological mechanisms in the etiology of LPR.
   - A better understanding of molecular mechanisms may allow the development of targeted therapy.
2. Diagnosis
   - The normal values for the pHmetry must be definitely established in a large number of normal volunteers sample.
   - Comprehensive collection of the evolution of speech parameters altered (under treatment) must be made.
3. Treatment
   - Methodologically correct RCT should assess the effect of PPIs and providing speech therapy.

References
[3] 2Laboratory of Anatomy and Cell Biology - UMONS