

# Awareness of European Otolaryngologists and General Practitioners Toward Laryngopharyngeal Reflux

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## Abstract

**Objectives:** To investigate the current trends in management of laryngopharyngeal reflux (LPR) among young European otolaryngologists and general practitioners (GP).

**Methods:** An international survey was sent to European general practitioners and all otolaryngologists under 45 years old from the 2017 IFOS meeting. This survey was conducted by the LPR Study Group of YO-IFOS (Young Otolaryngologists of the International Federation of Otolaryngological Societies).

**Results:** Among the 2500 attendees, 230 European otolaryngologists (response rate = 9%) completed the survey; an additional 70 GPs also completed the survey. GPs did not differentiate between gastroesophageal reflux disease (GERD) and LPR, overstating GERD-related symptoms (ie, heartburn and regurgitations) in LPR clinical presentation and relying on gastrointestinal endoscopy for LPR diagnosis. Otolaryngologists also believe that GERD-related symptoms are prevalent in LPR. Knowledge of nonacid and mixed LPR and use of multichannel intraluminal impedance-pH monitoring are still limited in both groups. A therapeutic dichotomy exists between groups: GPs mainly use a 4-week once daily empiric proton pump inhibitors (PPIs) trial, while otolaryngologists use PPIs twice daily for a longer therapeutic period ranging from 8 to 12 weeks. More than 50% of GPs and otolaryngologists believe that they are not adequately knowledgeable and skilled about LPR.

**Conclusion:** The majority of GPs and otolaryngologists do not believe themselves to be sufficiently informed about LPR, leading to different practice patterns and grey areas. The elaboration of international recommendations in the management of reflux is needed to improve practices.

## Keywords

practice, laryngopharyngeal, reflux, laryngitis, awareness, trend

## Introduction

Laryngopharyngeal reflux (LPR) is an inflammatory condition of the upper aerodigestive tract tissues related to direct and indirect effect of gastric or duodenal content reflux, which induces morphological changes in the upper aerodigestive tract.<sup>1</sup> LPR-related symptoms concern approximately 4% to 10% of outpatients visiting ear, nose, and throat (ENT) departments<sup>2</sup> and 1% of patients visiting general practitioners (GPs).<sup>3</sup> In most European countries, GPs are front-line health care professionals, and patients often visit GPs or otolaryngologists (OTLs) for their LPR-related symptoms.<sup>4</sup> However, the current knowledge and practices

of European GPs and OTLs have never been extensively assessed and perhaps still remain unknown. Such assessment may particularly clarify issues regarding definition, diagnosis, and treatment of LPR and the related high heterogeneity in the management of the disease reported in some American cohorts of otolaryngologists.<sup>5-8</sup>

The aim of this study is to investigate the current trends in management of LPR among European OTLs and GPs.

## Materials and methods

A survey was developed based on a systematic review of the LPR literature<sup>9</sup> by the LPR Study Group of Young

Otolaryngologists of the International Federation of Oto-rhino-laryngological Societies (YO-IFOS), which includes otolaryngologists from North America (Canada, USA), Europe (Belgium, France, Italy, Spain, Greece, and UK), and Asia (Turkey, Lebanon, and South Korea).<sup>10,11</sup> The survey was created with Survey Monkey (San Mateo, California, USA), so that each participant could complete the survey only once. The survey itself was developed in iterative fashion, with drafts revised by both 3 certified OTLs and 1 GP. The final version of the survey consisted of 21 questions divided into 5 sections: definition and epidemiology (3), clinical presentation (4), diagnostic approach (3), treatment (10), and skills (1) (see Appendix 1 in the online Supplemental Material). As 1 question was specific to use of flexible laryngoscopy in assessment of LPR, a skill routinely performed by OTLs but not GP, only the 20 non-endoscopy questions were used to compare OTLs and GPs.

The survey was emailed on 2 occasions to all OTLs under 45 years old (criteria of YO-IFOS representation) who had attended the 2017 IFOS meeting (Paris, France) and given their email addresses to YO-IFOS. Of these IFOS participants, 59% were European (N = 1751). The survey was also emailed to members of ear, nose, and throat (ENT) Greek society, French ENT society, and Confederation of European Otorhinolaryngology-Head and Neck Surgery. The survey was emailed to the departments of otolaryngology-head and neck surgery of the 32 university-affiliated hospitals of France. In addition, the survey participation was solicited among European GPs through Mediquality (Citobi S.A., Louvain-La-Neuve, Belgium) and MediSphere journals (Brussels, Belgium). OTLs were also invited to share the survey with GPs within their regions.

Responses were collated anonymously, and in the absence of any patient data, this study was exempt from the need for Institutional Review Board approval. Statistical Package for the Social Sciences for Windows (SPSS

version 22.0; IBM Corp, Armonk, New York, USA) was used to perform the statistical analyses. A level of  $P < .05$  was used to determine statistical significance. The differences in response between OTLs and GPs were evaluated using the  $\chi^2$  test. Incomplete responses were excluded from analysis.

## Results

A total of 2500 OTLs received the survey. Of these, 230 OTLs (response rate = 9.2%) completed the survey. An additional 70 GPs completed the survey. Three OTLs and 1 GP did not complete the entire survey, leading their responses to be excluded from analysis. GPs and OTLs had  $25.0 \pm 16.3$  (range, 1-57) and  $14.4 \pm 12.2$  (range, 1-60) years of practice as certified physicians, respectively. The main subspecialties of OTLs consisted of general otolaryngology (N = 200), laryngology (N = 34), head and neck surgery (N = 21), otology and neuro-otology (N = 12), rhinology (N = 20), and pediatric otolaryngology (N = 13); many responding OTLs listed more than one subspecialty.

### *Laryngopharyngeal reflux definition, epidemiology, and associated diseases*

GPs had a tendency to consider LPR and gastroesophageal reflux disease (GERD) as the same condition, while OTLs more often responded that LPR and GERD share some common pathophysiological mechanisms but are two different diseases regarding clinical presentation ( $P = .054$ ).

The majority of both GP and OTLs consider LPR to be unrelated to the development of acute otitis media, bronchial hypersensitivity, Eustachian tube dysfunction, vocal fold hemorrhage and polyps, Reinke's edema, vocal fold nodules, and laryngotracheal stenosis. Both groups believe that LPR can be associated with chronic throat pain. GPs

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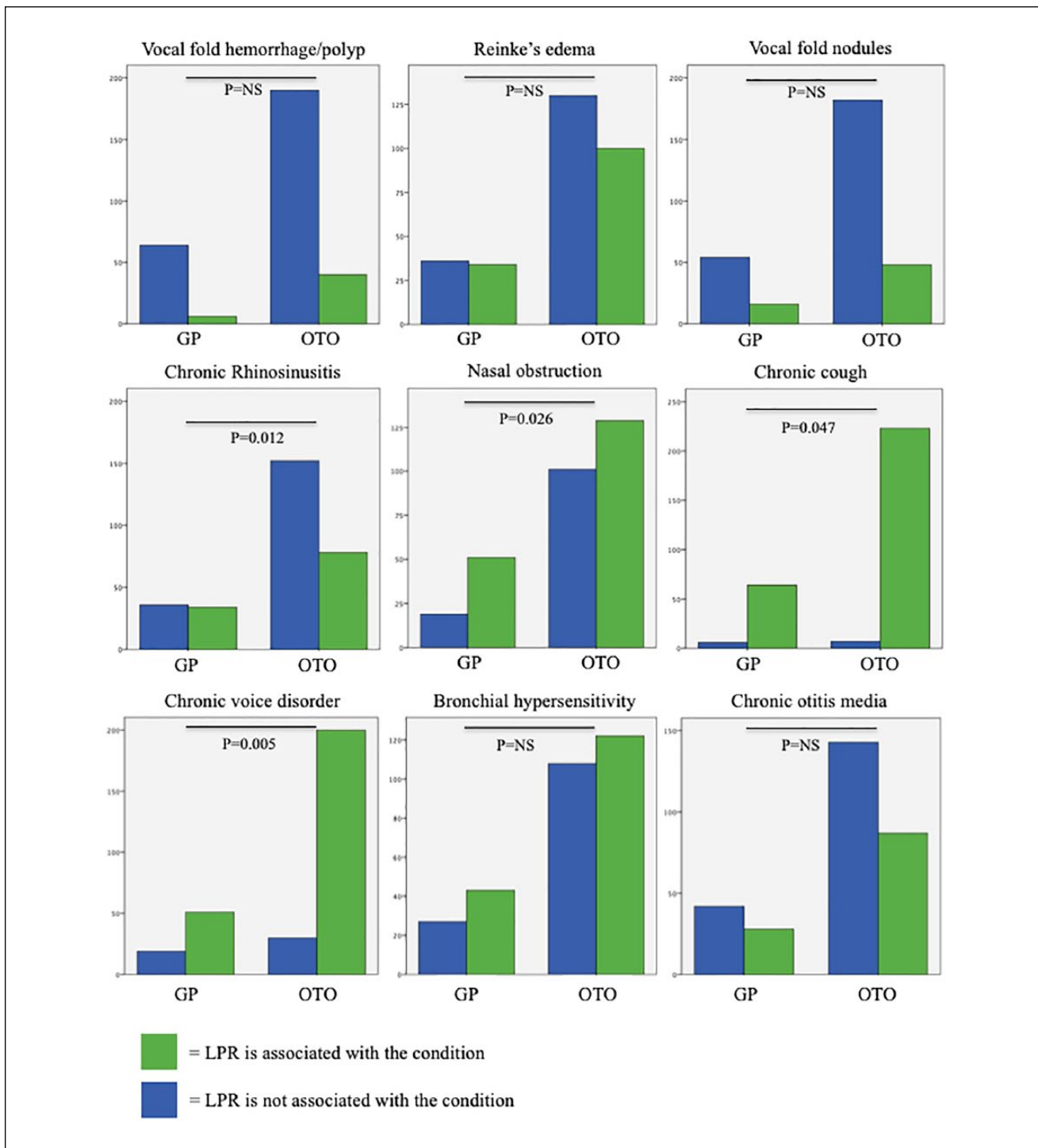
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**Figure 1.** Association between laryngopharyngeal reflux and some ear, nose, and throat conditions according to the specialty (general practitioners vs otolaryngologists).

Note: Physicians had to specify if LPR could be associated with the development of some head and neck conditions. Abbreviations: GP, general practitioners; LPR, laryngopharyngeal reflux; OTO, otolaryngologists.

believe more than OTLs that LPR can be associated with the development of chronic rhinosinusitis ( $P = .014$ ) and nasal obstruction ( $P = .026$ ). Compared to GPs, a higher

proportion of OTLs believe that LPR can be associated with chronic cough and hoarseness ( $P = .047$  and  $P = .005$ , respectively; Figure 1).

**Table 1.** Comparison of the Specificity of Symptoms That Can Be Associated With Laryngopharyngeal Reflux According to the Specialty (Otolaryngologists vs General Practitioners).

| Symptoms Associated With Laryngopharyngeal Reflux         | 1 = Highly Related |       | 2    |       | 3 = Somewhat Related |       | 4    |       | 5 = Not Related |       | Differences<br>P Value |
|---|--------------------|-------|------|-------|----------------------|-------|------|-------|-----------------|-------|------------------------|
|   | % GP               | % OTO | % GP | % OTO | % GP                 | % OTO | % GP | % OTO | % GP            | % OTO |                        |
| 1. Heartburn  | 17.2               | 29.3  | 21.9 | 16.3  | 48.4                 | 30.7  | 9.4  | 14.8  | 3.1             | 8.8   | .023                   |
| 2. Stomach acid coming up/regurgitation                   | 32.8               | 42.5  | 28.4 | 22.1  | 29.9                 | 24.3  | 6.0  | 9.3   | 3.0             | 1.8   | .448                   |
| 3. Troublesome cough                                      | 30.6               | 28.5  | 38.7 | 35.3  | 21.0                 | 30.8  | 8.1  | 4.1   | 1.6             | 1.4   | .487                   |
| 4. Cough after lying down/after meal                      | 28.8               | 41.1  | 27.3 | 31.7  | 22.7                 | 21.9  | 19.7 | 2.2   | 1.5             | 3.1   | .001                   |
| 5. Globus sensation                                       | 12.5               | 36.7  | 20.8 | 24.3  | 43.8                 | 23.8  | 8.3  | 8.1   | 14.6            | 7.1   | .004                   |
| 6. Hoarseness/voice disorder                              | 25.4               | 20.4  | 25.4 | 29.2  | 37.3                 | 36.3  | 9.0  | 12.4  | 3.0             | 1.8   | .775                   |
| 7. Throat pain  | 19.4               | 18.1  | 38.8 | 34.5  | 37.3                 | 31.9  | 4.5  | 12.8  | 0.0             | 2.7   | .210                   |
| 8. Odynophagia  | 17.7               | 6.2   | 22.6 | 16.4  | 45.2                 | 34.7  | 14.5 | 26.7  | 0.0             | 16.0  | .001                   |
| 9. Dysphagia  | 7.9                | 5.0   | 33.3 | 10.4  | 36.5                 | 32.9  | 15.9 | 34.7  | 6.3             | 17.1  | .001                   |
| 10. Chest pain  | 3.0                | 2.7   | 19.7 | 11.2  | 39.4                 | 31.7  | 28.8 | 34.4  | 9.1             | 20.1  | .101                   |
| 11. Accumulation of throat sticky mucus or postnasal drip | 25.4               | 23.5  | 23.9 | 34.1  | 25.4                 | 32.3  | 20.9 | 4.0   | 4.5             | 6.2   | .001                   |
| 12. Throat clearing                                       | 25.4               | 40.3  | 32.8 | 31.0  | 29.9                 | 21.7  | 10.4 | 3.5   | 1.5             | 3.5   | .038                   |
| 13. Tongue burning  | 15.6               | 6.7   | 18.8 | 20.9  | 40.6                 | 37.8  | 18.8 | 24.4  | 6.3             | 10.2  | .173                   |
| 14. Halitosis   | 25.0               | 11.6  | 20.6 | 23.2  | 33.8                 | 41.5  | 19.1 | 17.0  | 1.5             | 6.7   | .040                   |
| 15. Breathing difficulties                                | 7.7                | 2.7   | 15.4 | 6.7   | 50.8                 | 30.2  | 20.0 | 37.8  | 6.2             | 22.7  | .001                   |

Abbreviations: GP, general practitioners; OTO, otolaryngologists.

### Laryngopharyngeal reflux clinical presentation

According to the majority of both OTLs and GPs, symptoms thought highly related to LPR include sensation of stomach acid coming up, troublesome cough, hoarseness, and throat pain (Table 1). OTLs thought that chest pain and tongue burning are not related to LPR, while most GPs thought that these symptoms were and sometimes related to LPR. OTLs considered heartburn, cough after lying down or after meals, globus sensation, throat clearing, and sticky mucus as more highly associated with LPR than GPs. Conversely, GPs considered odynophagia, dysphagia, and breathing difficulties as more associated with LPR than OTLs.

### Diagnostic approaches

In each group, the main approach for diagnosis was evaluation of symptoms and signs, accounting for 34.9% of GPs and 25.2% of OTLs, respectively ( $P = .087$ ). According to 37.9% of GPs and 53.9% of OTLs, diagnosis is confirmed by positive response to an empiric therapeutic trial with proton pump inhibitors (PPIs;  $P = .105$ ). GPs more systematically used gastrointestinal (GI) endoscopy for LPR diagnosis than OTLs (22.2% vs 11.4%;  $P = .001$ ). Irrespective of specialty, less than 10% of GPs and OTLs utilized any of the following additional examinations: esophageal manometry, transnasal esophagoscopy, single or multiple probe pH-monitoring, multichannel intraluminal impedance-pH monitoring (MII-pH), or salivary pepsin detection.

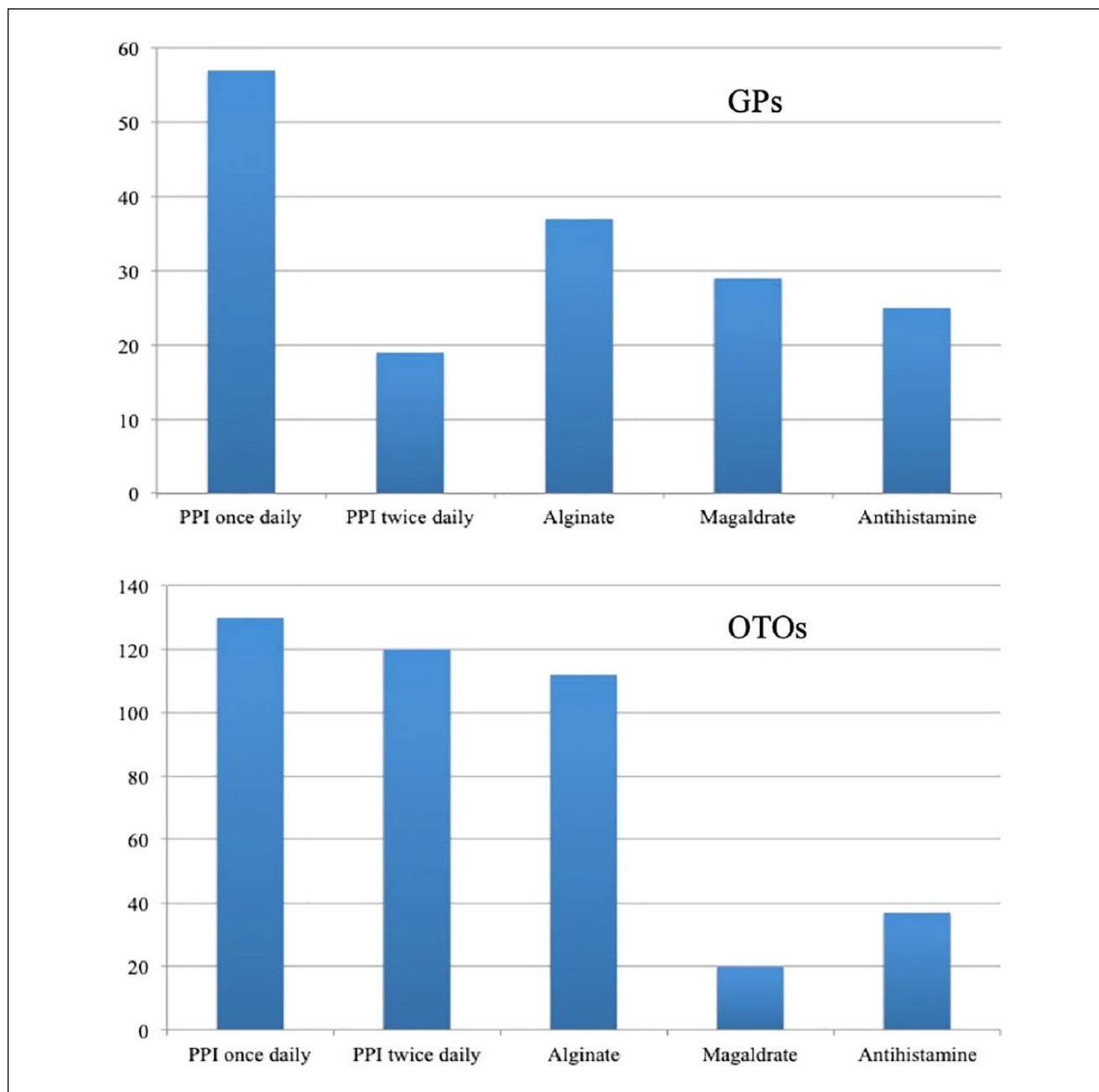
Upon reaching diagnosis of LPR, 28.1% of GPs and 23.5% of OTLs refer the patient to gastroenterology

( $P = .571$ ). In comparison with OTLs, GPs believe that the main barriers to using MII-pH are patient inconvenience ( $P = .026$ ), lack of tolerance ( $P = .024$ ), and unclear indications ( $P = .013$ ); at the same time, OTLs as compared to GPs more frequently responded that they do not know the benefit of MII-pH ( $P = .001$ ). Of the sample, 32.5% of OTLs and 25.4% of GPs reported that they could not interpret the results of MII-pH.

### Laryngopharyngeal reflux treatment

The various therapeutic approaches used by physicians are summarized in Figure 2. Proportionately, GPs used once-daily PPI, magaldrate, and H2-blockers more frequently than OTLs; OTLs were more likely to utilize twice-daily PPI ( $P = .001$ ). For 85.3% of OTLs and 86.7% of GPs, medical treatment includes recommendations for dietary and lifestyle modification. In fact, in cases of mild LPR-related symptoms, 56.5% of GPs and 53.2% of OTLs give diet and behavioral advice as the only treatment provided. The duration of empiric therapeutic trial varies significantly between groups, with GPs providing shorter therapeutic trials than OTLs (Figure 3). According to 60.3% of GPs and 59.6% of OTLs, success or failure of an empiric trial was judged clinically, with evaluation of potential improvement in symptoms and findings.

If an empiric trial failed, the majority of OTLs refer patients to gastroenterology, while GPs more frequently proceed to additional examinations ( $P = .001$ ; Figure 4). Only 17.8% of OTLs and 8.6% of GPs are aware of non-acid and mixed LPR, and irrespective of specialization,



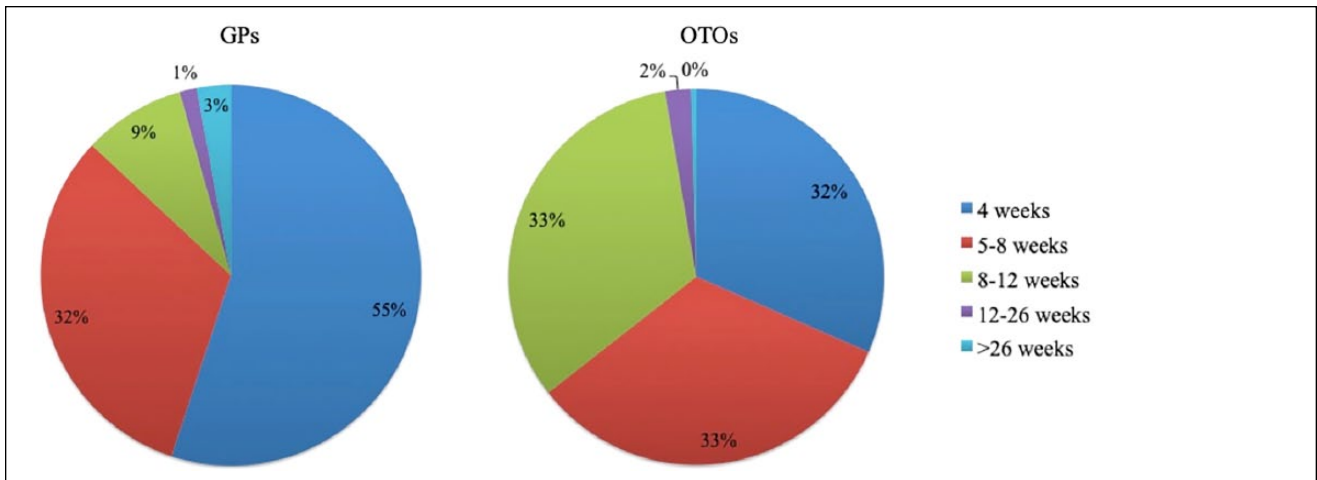
**Figure 2.** The pattern of anti-reflux treatments used by general practitioners and otolaryngologists.

Note: Proportionately, general practitioners more frequently prescribe PPIs once daily, alginate, magaldrate, and antihistamine than otolaryngologists. The 3 main treatments used by otolaryngologists are PPIs once daily, PPIs twice daily, and alginate. Otolaryngologists anecdotally use magaldrate and antihistamine. Abbreviations: GP, general practitioners; OTO, otolaryngologists; PPI, proton pump inhibitor.

physicians provided a wide variety of estimates for prevalence of mixed and nonacid LPR (ranging from 0% to 80%). The potential causes of treatment failure are summarized in Figure 5. The majority of OTLs considered poor dietary habits as the main cause of treatment failure, while the majority of GPs believe that it is the lack of compliance to prescribed medications.

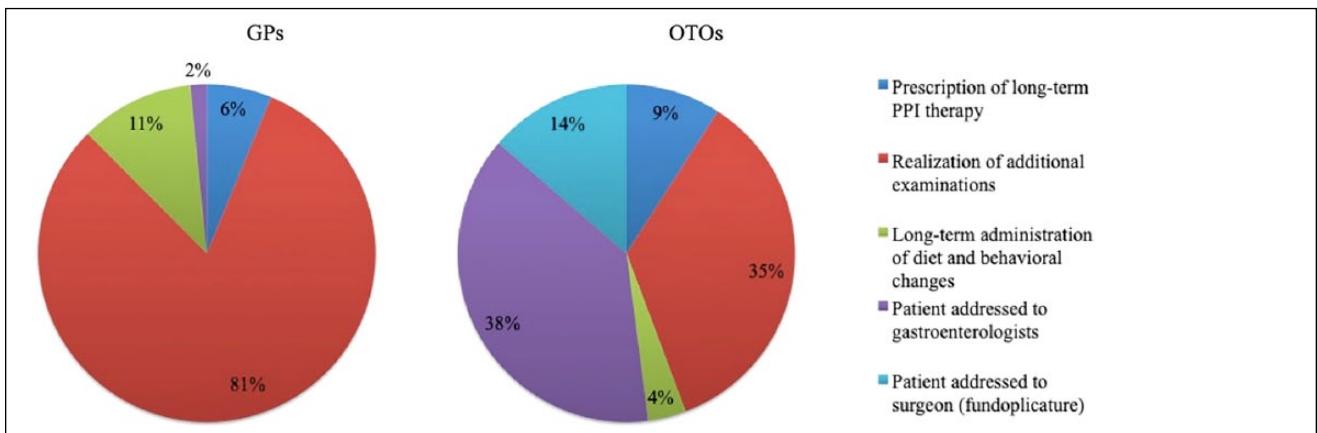
### Skills

Only 10.1% of GPs and 27.4% of OTLs considered themselves to be adequately knowledgeable and skilled about LPR, while 69.6% and 54.0% believed the opposite. In addition, 20.3% of GPs and 18.6% of OTLs stated that they do not know if they are adequately knowledgeable and skilled about LPR (Figure 6).



**Figure 3.** Treatment duration differences between general practitioners and otolaryngologists.

Note: General practitioners give 4-week treatment in 55.1% of cases and a treatment of 5 to 8 weeks in 31.9% of cases; the therapeutic duration ranges from 8 to 14 weeks in 8.7% of cases. In 31.6%, 32.9%, and 32.9% of cases, otolaryngologists give a 4-week, 5- to 8-week, and 8- to 14-week treatment duration, respectively. These differences were all significant ( $P = .001$ ). Abbreviations: GP, general practitioners; OTO, otolaryngologists.



**Figure 4.** Management of resistant patients to empirical therapeutic trial.

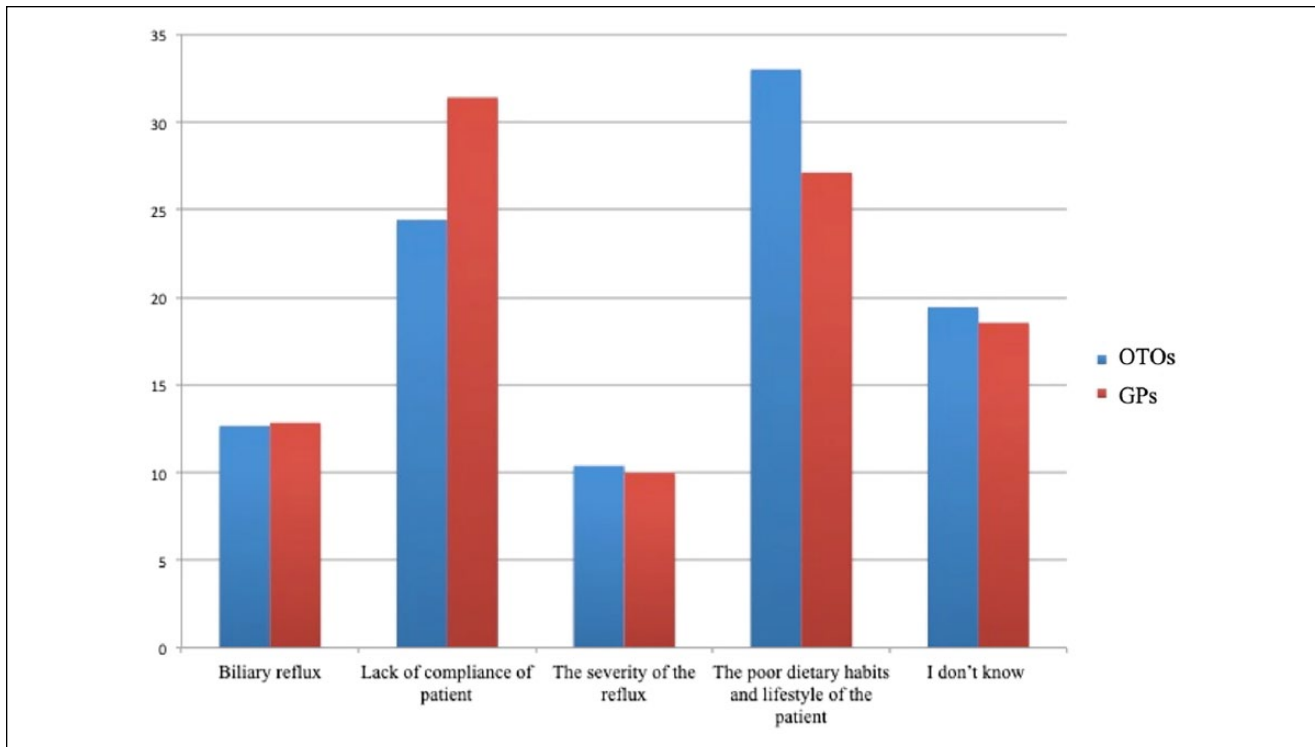
Note: Proportionately, otolaryngologists more frequently refer the patient to gastroenterologists or surgeons while general practitioners make additional examinations. Only a small proportion of general practitioners primarily address resistant patients to the gastroenterologists. These differences of practice are significant ( $P = .001$ ). Abbreviations: GP, general practitioners; OTO, otolaryngologists; PPI, proton pump inhibitor.

## Discussion

The number of studies devoted to LPR have gradually increased over the past 2 decades.<sup>9,12</sup> However, LPR is still controversial, especially the diagnostic approach and treatment of these patients; additionally, many physicians are not aware of the prevalence of this condition. This survey is the first study of this size designed to examine and compare the current practice patterns of European OTLs and GPs.

First, we found that a majority of GPs and OTLs consider LPR not to be associated with acute otitis media, bronchial hypersensitivity, Eustachian dysfunction, laryngotracheal stenosis, and some benign lesions of the vocal folds, namely, Reinke’s edema, nodules, and polyps. However, according to some clinical and experimental

studies, LPR is increasingly suspected to be associated with laryngotracheal stenosis,<sup>13-16</sup> acute otitis media,<sup>17,18</sup> and Eustachian dysfunction.<sup>18</sup> The role of LPR in the development of benign lesions of the vocal folds, especially nodules, Reinke’s edema and polyps, is also highly probable,<sup>19</sup> and LPR is also thought to be a co-factor in bronchial hypersensitivity.<sup>20-22</sup> Interestingly, GPs are more aware than OTLs concerning the role of LPR in the development of chronic rhinosinusitis. This is in line with recent investigations in which authors found pepsin in nasal mucosa of patients with chronic rhinosinusitis,<sup>23,24</sup> while others identified substantial pharyngeal or nasal reflux episodes through pH monitoring study in patients with chronic rhinosinusitis.<sup>25,26</sup> For these chronic conditions to be adequately



**Figure 5.** Percentages of main causes of resistance to treatment according to otolaryngologists and general practitioners. Note: More than 30% of general practitioners believe that the lack of compliance to treatment is the main cause of treatment resistance. The majority of otolaryngologists consider that poor patient dietary habits and lifestyle is the main cause of resistance. There is no significant difference between groups about the distribution of the answers. Abbreviations: GP, general practitioners; OTO, otolaryngologists.

treated, the possibility that anti-reflux drugs might be a helpful adjunct in care needs to be considered.

European OTLs and GPs consider stomach acid coming up, cough, hoarseness, and throat pain as the most LPR-related symptoms. According to a recent systematic review, the most prevalent symptoms associated with LPR are globus sensation, throat clearing, hoarseness, excess throat mucus, and postnasal drip.<sup>9</sup> The prevalence of throat pain has been little studied because this symptom was not included the majority of the well-used patient-reported outcome questionnaires such as reflux symptom index.<sup>27</sup> However, throat pain might be present in 68.5% of LPR patients, making it potentially one of the most prevalent complaints of patients with confirmed LPR.<sup>28</sup>

Interestingly, 45.6% of OTLs and 39.1% of GPs consider heartburn as an important symptom of LPR, though evidence shows that the prevalence of heartburn and GERD-related symptoms actually may be less than 50% in LPR patients.<sup>9,29</sup> A similar observation is made with acid brash, which is considered highly prevalent in LPR by 42.5% of OTLs even though evidence suggests that more than 50% of LPR patients experience this symptom.<sup>9,29</sup>

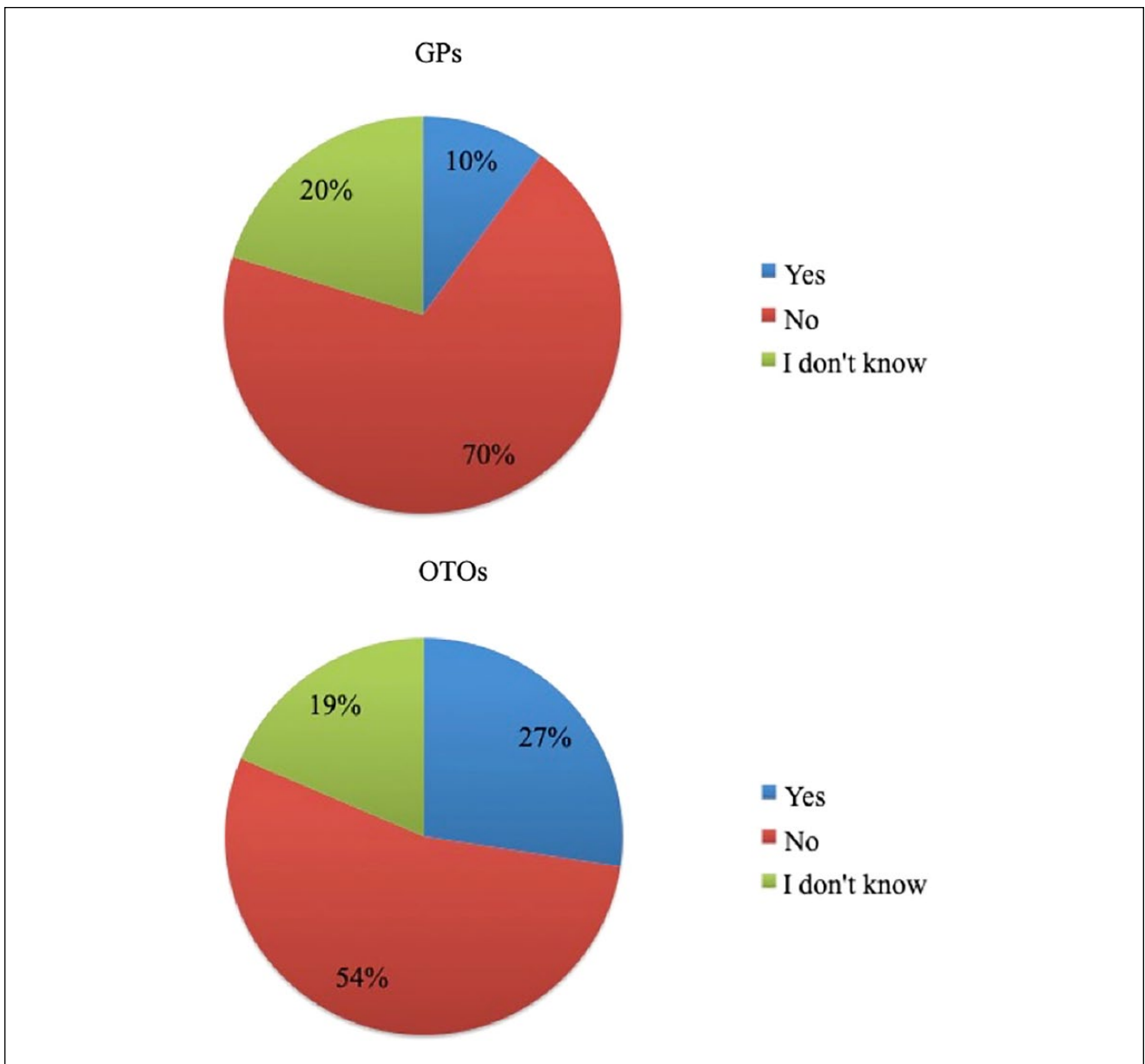
Another finding of the current study is that GPs more regularly use GI endoscopy for LPR diagnosis than OTLs. This practice may be related to different overall approaches

of reflux disease at baseline—GPs seem to consider LPR as an extension of GERD while OTLs are more likely to imagine that LPR can exist without classical GERD complaints.

Overall, awareness of different approaches to LPR among different specialties is not new, though prior studies are from many years ago and practice patterns may have changed as knowledge has evolved. In an American survey from 2006, Ahmed et al<sup>7</sup> reported a dichotomy in treatment dose, duration, and perceived patient response to therapy between OTLs and gastroenterologists; a large number of the latter systematically used GI endoscopy in the diagnostic approach for LPR. In the current study, both GPs and OTLs considered good response to empiric therapeutic trials to confirm diagnosis of LPR. This diagnostic approach is used widely around the world<sup>30-32</sup> despite its limitations relative to false positives caused by the fluctuating nature of vague complaints such as throat clearing, globus pharyngeus, and so on, which may resolve on their own—the response to placebo is often as high as it is to PPI.<sup>1</sup>

In fact, the most validated diagnostic approach for LPR is MII-pH. However, our study shows that the great majority of OTLs and GPs do not use MII-pH; the main barriers to its use are patient inconvenience and lack of tolerance, unclear indications, and perceived lack of benefit of this approach in LPR management. Moreover, a significant





**Figure 6.** Self-perception of knowledge and skills about laryngopharyngeal reflux of general practitioners and otolaryngologists.

number of physicians recognize that they cannot interpret the results of MII-pH and are not aware of the prevalence and importance of nonacid and mixed LPR. Awareness of lack of knowledge concerning LPR might explain why 28.1% of GPs and 23.5% of OTLs refer patients to gastroenterologists at baseline. This point is very important because many patients with nonacid or mixed reflux are treated with prolonged high doses of PPIs;<sup>19</sup> however, these nonacid types of reflux could require adapted treatment associating alginate, magaldrate, and other drugs to neutralize the mucosa activity of nonconjugated bile salts and trypsin.<sup>9</sup> The up-front use of MII-pH for patients with significant

LPR-related symptoms might comprise a more cost-effective approach than empiric therapy, potentially limiting the use of PPIs in patients without LPR and allowing personalized treatment of patients with LPR relative to their types of reflux (acid, nonacid, mixed).<sup>9,12</sup>

Current therapeutic trends differ between GPs and OTLs. GPs more often prescribe once-daily PPIs and H2-blockers than OTLs. The duration of empirical treatment prescribed by GPs is significantly shorter than that of OTLs. In practice, the prescription of twice-daily PPIs seems to be more efficient than once-daily PPIs.<sup>33</sup> The use of once-daily H2-blocker is not recommended in LPR due to their short



duration of action.<sup>34</sup> For 3 decades, the recommended duration of empiric therapeutic trials has been 3 to 6 months,<sup>30,35</sup> although there is usually a symptom improvement after 4-week treatment.<sup>36</sup> In practice, some LPR findings may require more time to improve.<sup>32</sup>

Some recommendations suggest a 3-month duration for empiric treatment followed by titration of medication based on patient response.<sup>1,9</sup> A minimum treatment duration of 3 months is still recommended according to some studies exhibiting that laryngopharyngeal findings associated with LPR require at least 2 months to improve.<sup>34</sup> This study provides important information about the types of drugs and the duration of treatment prescribed by OTLs and GPs. This information could be useful in the near future to improve European medical practice and reduce the costs of reflux treatment. In the US, the mean initial year direct cost is \$5438 per patient being evaluated for LPR (including consultation, additional examination, and PPI expense).<sup>9</sup> In Europe, there is not yet a study that assesses the cost related to the management of LPR.

The estimated success rate of treatment is 63% according to both GPs and OTLs, which is consistent with the success rate reported in the literature.<sup>9</sup> GPs believe that the most frequent cause of resistance to treatment is lack of medication compliance, whereas OTLs consider poor diet and lifestyle to be the primary cause of treatment failure. A recent study of Piseigna et al<sup>37</sup> showed that 62.7% of LPR patients did not adequately take their medication. The response of GPs is not surprising given their proximity with their patients. However, poor dietary habits could also play a key role in the lack of response to treatment according to some studies that report diet and lifestyle to be important factors in management of LPR.<sup>38,39</sup> In either cases, physician awareness of the importance of compliance with both medication and diet/lifestyle compliance is such that better patient education at baseline is warranted.

In comparison with previous studies,<sup>5-8</sup> the main strength of this study is the high number of participants (OTLs) to a long but complete survey. Unfortunately, GP response was limited despite efforts to reach GPs through 2 major journals. Unfamiliarity with LPR may have played a role in the low number of responses by GPs, and participation bias may mean that the GPs who did respond felt themselves more informed about LPR than their nonrespondent peers. In the future, it will be interesting to conduct similar study on gastroenterologists and pulmonologists to compare practice differences.

## Conclusion

This study reveals significant differences of practices between GPs and OTLs and some grey areas in both specialties. The majority of physicians believe that they are not adequately knowledgeable and skilled on LPR. However,

one-quarter refer LPR patients to gastroenterology at baseline. Efforts must be taken to improve the knowledge of European physicians about the most prevalent LPR symptoms. The high majority of responders were not aware of the role of MII-pH, which highlights the existence of non-acid and mixed LPR. Physicians should be made aware of the importance of checking for compliance before “labeling” a patient as resistant to treatment. Regarding the high incidence of LPR-related symptoms in general population, it seems important to raise awareness of current and future physician generations about the management of LPR. Establishing international recommendations might be the first step in improving physician practice.

## Authors' Note

Dr Jerome Lechien and Dr Francois Mouawad have equally contributed to this work and should be regarded as joint first authors. Dr Karkos and Dr Akst have equally contributed to this work and should be regarded as joint last authors.

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## Supplemental Material

Supplemental material for this article is available online.

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