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Laryngopharyngeal reflux in the light of current medical knowledge – a literature review

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ABSTRACT

Introduction and aim of the work: Laryngopharyngeal reflux often occurs in daily otolaryngological clinical practice. Diagnostics and treatment of this disease are complex for clinicians. Proton pump inhibitors cause many adverse effects, so alternative therapeutic methods are required. This study aims to submit current medical knowledge about laryngopharyngeal reflux, including possible treatment options.

Materials and methods: The literature review of medical articles published between 2014 and 2024 was performed. These papers were accessed from the PubMed and Springer Nature Link databases. To find relevant articles, the following keywords were used: "laryngopharyngeal reflux", "reflux laryngitis", "proton pump inhibitors", and "baclofen side effects".

State of knowledge: Symptoms of laryngopharyngeal reflux can result in reduced quality of life. Laryngopharyngeal symptoms are not that specific. Patients often search for a reason for their complaints at different specialists. Treatment of this disease is usually based on the trial-and-error method and observing patients' responses.

Summary: The accurate incidence of laryngopharyngeal reflux is not known. Various factors influence the occurrence of this disease. There are disparate opinions about using 24-hour pH monitoring as a gold standard; thus, other methods are sought. Proton pump inhibitors are the most common drugs used in the therapy, but their effectiveness is doubtful. More research should be done on the different methods of laryngopharyngeal reflux treatment. Pepsin inhibitors seem like an auspicious alternative, but there are too few studies on this subject.

Keywords: laryngopharyngeal reflux; proton pump inhibitors; pepsin inhibitors.

INTRODUCTION

Laryngopharyngeal reflux (LPR) is an affliction connected with inflammatory etiology. It is caused by the reflux of gastric contents to the larynx and pharynx. [1-3] Fluids from the stomach damage the mucous membrane and cause changes in its structure. [2, 4] Some authors contend that LPR is an extraesophageal manifestation of gastroesophageal reflux disease (GERD). On the other hand, most otolaryngologists consider this pathology as a separate disease unit. [2] Laryngopharyngeal reflux may be caused by stress factors, poor diet and bad lifestyle. [1] The direct mechanism of this disorder is based on the reflux of fluid which contains pepsin, trypsin, and bile leading to a local inflammatory response. [1, 2, 5] Another mechanism

is an irritation of the lower part of the esophagus by reflux, which activates chemoreceptors. [1] Because of the foregoing modifications, laryngeal reflexes such as cough and spasm are induced. [1, 6]. The incidence of LPR is not easy to determine due to non-specific symptoms and tough diagnostics. [1] A review of the medical literature shows inconsistent data relating to gender-specific superiority of LPR occurrence. Kapil et al. claimed that this disease is more frequent in females. [7] On the contrary, Suda et al. showed male prevalence of LPR. [8] Studies suggest that this illness can appear more often in the 3rd, 4th, and 5th decades of life. [3, 6, 7]. Recently, an increase of LPR has been observed. [5] Laryngopharyngeal manifestations occur in 50% of patients healed by otolaryngologists. [9] It is important to emphasize the fact that the costs of LPR treatment are much higher than in GERD. [10-11]

RISK FACTORS AND PATHOMECHANISM

Reflux is defined as the backflow of stomach contents to the pharynx and larynx. [2] The main pathomechanism of LPR is dysfunction of the upper or lower esophageal sphincter. [12] In GPR, up to 50 episodes of acid reflux may be considered normal; in LPR, even a single episode is considered pathological. [13] Physiologically, laryngeal receptors stimulated by acidic substances cause bronchospasm, accumulation of viscous secretions, swallowing reflex and coughing. When LPR occurs, patients cough and clear their throat, which increases mucosal swelling and, thus refluxes. [2]

Laryngopharyngeal mucosa is fragile. [2] In healthy laryngeal mucosa, carbonic anhydrase III (CA III) protects against acid refluxate. [13] Some patients with LPR lack carbonic anhydrase III in throat tissue, so they cannot neutralize gastric acid pH through bicarbonate secretion. [2] Johnson et al. demonstrated that LPR patients have lower levels of carbonic anhydrase in the vocal cord epithelium. H+/K+-ATPase is mainly found in gastric parietal cells. Still, Altman et al. demonstrated that it is also found in serous cells in the human larynx, which may result in additional exposure to acidic content. [14-15] High expression of H+/K+-ATPase causes abnormal acid secretion and, thus, local inflammation, mitochondrial destruction and carcinogenesis. High levels of this enzyme have been demonstrated in laryngeal cancer tissues. [15]

LPR can be caused by microaspiration of acids, bile acids and pepsin, damaging the larynx. [16] Pepsin causes hydrolysis of proteins and, thus, cell damage. In healthy humans, pepsin is not detected in the larynx mucosa. Gastric contents backing up into the throat contain pepsin, which can disrupt the integrity of the epithelial barrier via the E-cadherin, CA III, nuclear factor (NF)-κB and interleukin (IL)-8 signalling pathways. In addition to mucosal

destruction, pepsin can also cause chronic inflammation, leading to vocal cord polyps, tonsillar hypertrophy, otitis media or laryngeal tumours. [2] In biopsy material of patients with laryngeal cancer, pepsin was found in 60% of cases; it was not observed in samples from healthy patients. [17] Another pathogenetic factor is bile acids, which are protonated under the influence of hydrochloric acid, enhancing their cytotoxic effect. The induction of epithelial-mesenchymal transition (EMT) of one cell, induces an increase in transforming growth factor β1 (TGF-β1), matrix metalloproteinase (MMP)-9, fibronectin and decreases the expression of E-cadherin, leading to laryngotracheal scarring and tracheal stenosis. Bile acids can cause NF-κB activation leading to DNA/RNA damage and abnormal expression of tumour factors. Pancreatic cell-derived trypsin content induces secretion of IL-8 and transient receptor potential vanilloid, causing pharyngeal epithelial barrier dysfunction. [2]

An alternative theory for the origin of LPR is the stimulation of the vagus nerve by reflux from acidic gastric contents in the distal oesophagus. [16] This leads to chronic cough, laryngeal irritation and symptoms of LPR. [18] Shaker et al. showed that pharyngeal reflux was augmented by increasing intraluminal upper esophageal sphincter pressure through external cricoid pressure. [9] Patients with neurologically mediated symptoms do not always have pathologic reflux or esophagitis. [19]

Risk factors for LPR include a sedentary lifestyle, nicotinism, and alcohol consumption. [3] Other sources point to the consumption of tea, coffee, caffeinated beverages, and fried and fatty foods. [7] Fatty foods take longer to digest and cause reflux episodes. Acidic foods and amino acids cause pepsin activation in the airways. [1] Also, tight clothing, stress and being overweight as well as pregnancy, a malfunctioning esophageal sphincter and reduced gastric motility can cause LPR symptoms. [6, 8]

CLINICAL PICTURE

Laryngopharyngeal reflux with its symptoms can imitate other diseases such as allergies, pharyngitis, tonsillitis, rhinitis, sinusitis, asthma, and even laryngeal cancer. [7, 12, 20] Laryngopharyngeal symptoms are non-specific thus it is hard to make a diagnosis only based on clinical features.

Among the symptoms of LPR are hoarseness, chronic cough, accumulation of mucus in the pharynx with the necessity to expectorate, globus pharyngeus, sore throat, persistent throat inflammation, dysphonia, and dysphagia. [1, 2, 3, 8] The typical clinical picture of GERD, including heartburn and regurgitation are not so evident in LPR, because it is often caused by a non-acidic, gaseous type of reflux. [1] Kapil et al. maintained that the most exhausting

symptoms in patients were sensations of a foreign body and hoarseness. Dysphagia and problems with breathing occurred with the lowest incidence. [7] Puttamadaiah et al. showed that in people with LPR, the most common symptom was clearing of the throat. The rarest symptoms were respiratory difficulties or choking episodes. [6] Clearing of the throat was also the most frequent symptom in the observation of Yun et al. Additionally, in their article the sensation of a foreign body was also mentioned as a common manifestation. [21] It should be also emphasized that more than half of patients struggle with voice disorders. [8] Therefore, during chronic hoarseness diagnostics, laryngopharyngeal reflux ought to be considered in the differential diagnosis. [17]

DIAGNOSTICS

There are many methods for diagnosing laryngopharyngeal reflux. Those currently in use include history, physical examination, fibrolaryngoscopy, 24-hour pH monitoring, esophageal manometry, biomolecular marker detection, pepsin detection, esophagography and reflux scale scoring. [2] 24-hour pH impedance monitoring is referred to as the gold standard [2, 14, 22]. Other sources point out its shortcomings and do not refer to it as the gold standard due to the number of false positive and false negative results. [1, 8, 12]

The Reflux Symptom Index (RSI) is based on the severity of 9 symptoms such as voice problems, throat clearing, excessive throat secretion, difficulty in swallowing food or liquids, coughing after eating or lying down, suffocation crises, irritating cough, sensation of having a sore throat while not assessing the presence of a sore throat, odynophagia and halitosis. LPR can be diagnosed by RSI >13 [1, 2, 20]. Studies have shown RSI to be of little utility in diagnosing LPR, so it cannot make a definitive diagnosis. [14]

Reflux Finding Score (RFS) is assessed by clinicians in electronic laryngoscopy, showing vocal cord oedema, diffuse laryngeal oedema, etc. [3] It is described as highly subjective, not considering symptoms such as oro- and hypopharyngeal erythema, retrocricoid oedema, lingual tonsil hypertrophy, saburral tongue, anterior pillar erythema, etc. LPR can be diagnosed with an RFS >7. [1-2]

The Reflux Sign Assessment (RSA) considers laryngeal and extraglottic symptoms. It has proven to be more useful than RFS. [1]

Reflux Symptom Score (RSS) is believed to be more credible than RSI because a score >13 has 95% sensitivity for reflux diagnosis and can be used as screening. RSS survey embraces questions about symptoms connected with the ear, throat, abdomen, chest, and respiratory system. [1]

Physical examination cannot confirm or deny the diagnosis of LPR. [14] The advantages of the above scales are their low cost and practicality. [3] Scale-based examinations always include the subjective factor of the examiner and the examinee, including the patient's understanding of the scale or the examiner's experience. This can reduce the sensitivity and specificity of scale-based diagnoses and may result in patients without LPR being judged as having LPR and receiving PPI treatment. [23]

Park et al. found that posterior laryngitis and vocal fold oedema strongly correlate with LPR symptoms. [24] Flexible laryngoscopy also excludes other diagnoses, such as allergic rhinitis or sinusitis. [16] The most common alternative diagnoses were muscle tension dysphonia, vocal fold polyps, vocal fold nodules and sulcus or scar, and rarely cancer. [9] Studies have shown that more prominent laryngoscopic findings are associated with better LPR treatment outcomes. [13]

24-hour pH impedance monitoring allows for the assessment of the type of reflux (acid, non-acid, mixed, liquid, gas), number of episodes, and time when they occur. It has already replaced traditional pH monitoring, which failed to detect non-acidic episodes. Unfortunately, many patients with LPR on 24-hour monitoring will not have an episode of reflux. Symptoms do not always correlate with the presence of reflux on pH impedance, so the absence of reflux does not rule out a diagnosis of LPR. A 48- or 96-hour measurement should be considered. There are also no standardized probe positioning and diagnostic criteria. [1] PH values below 4.0 are considered diagnostic for LPR. [14] It is an invasive and expensive test, significantly limiting its usefulness in clinical practice. Up to 12% of patients cannot tolerate this test. [2, 12, 23] Guidelines recommend monitoring reflux onset before starting pharmacotherapy in patients with LPR symptoms without heartburn or regurgitation, based on the fact that 50-60% of patients with isolated laryngeal symptoms do not respond to anti-reflux therapy. [16] Based on pH monitoring, personalized treatment can be proposed. [11]

Oropharyngeal pH monitoring is proposed as an alternative to pH impedance. A probe is placed in the oropharynx for 24 hours. Studies suggest that oropharyngeal pH monitoring may better identify patients who will benefit from treatment with LPR. [25] However, the advantage of pH impedance is the simultaneous detection of LPR and GER. [1] Artificial neural network pattern recognition may be helpful for the objective evaluation of reflux in MII-24 pH or laryngoscopy images. [14]

Another method is based on detecting pepsin by immunohistochemical analysis in mucous membranes or secretions at different times of the day: after waking, after a meal, or after an episode. A recent meta-analysis assessed sensitivity and specificity in saliva at 64%

and 68%, respectively. [1] Studies on the presence of pepsin vary in cutoff point and in the sample collection method, which includes saliva, sputum, and laryngeal and pharyngeal biopsies. [14] Saliva sampling is promising because it is minimally invasive and easy to perform. [12] However, Peptest can be positive in 9 to 53% of healthy individuals, showing a low negative predictive value. Peptest shows the concentration of pepsin, which is not always related to its activity and effects on the mucosa [23] Patients with a positive Peptest responded better to treatment than those with a negative test. [21] Studies indicate that measuring pepsin may help monitor the effectiveness of surgical treatment of LPR. [17, 26] It has been proven that there is no correlation between the number and duration of reflux episodes and pepsin levels, suggesting that other enzymes, such as trypsin, may also be responsible for toxicity. [1]

Another marker that is possible to evaluate in LPR is bile acids. De Corso et al. estimated a sensitivity and positive predictive value of 80%. [2, 15]

Multiple parameters are proposed to be assessed simultaneously, combining 24-hour pH impedance with assessment of pepsin and trypsin levels. [1]

TREATMENT

Due to the development of diagnostic methods, treatment of LPR should be personalized as much as possible while paying attention to the type of reflux. [1] Proper diet and modification of the patient's lifestyle have a significant role in the effectiveness of therapy. [3] These actions can have a beneficial influence on the decrease of gastric acid and improvement of esophageal sphincter and gastric motor activity. [21] Not all patients follow the medical recommendations and that may be associated with the inefficiency of pharmacotherapy. [1] Treatment of LPR is much longer than healing GERD. It usually lasts 3 to 6 months but sometimes can be longer. [22]. Various potential methods of LPR treatment will be discussed in this article.

Modification of diet and lifestyle

Important aspects of anti-reflux therapy are appropriate diet and lifestyle modification. It is believed that a Mediterranean diet rich in vegetable proteins and low in animal fat has a benign impact on laryngopharyngeal symptoms. Patients with mild and moderate complaints do not need pharmacological treatment, because following nutritional recommendations by itself is adequate. [1, 13] It is important to emphasize the fact, that patients who take drugs and simultaneously change their diet and lifestyle, obtain much better results than those who are only on medications. [2, 13, 16]

Consuming plant-based products conduce to repairment of damaged laryngeal and pharyngeal mucosa. [2] In vitro studies show that alkaline water i.e. with a pH higher than 8 may induce pepsin. [9] There are also food products that encourage laryngopharyngeal symptoms because they lead to prolonged gastric acidity. [27] Examples include fatty animal products, fried dishes, nuts, spicy seasonings, onions, garlic, tomatoes, aspartame, rhubarb, blueberries, refined carbohydrates, fizzy drinks, alcohol, coffee, tea, and citrus drinks. [2, 6, 16] Drugs such as theophylline, iron preparations, Ca-blockers, aspirin, progesterone, anticholinergic drugs, glucocorticosteroids, and nonsteroidal anti-inflammatory drugs may also be unbeneficial. [2, 16]

In addition, the following advice should be implemented to the patient's lifestyle: avoid tight clothes and lying down just after meals, abstain from eating and drinking 2-3 hours before sleep, chew gum during the day (it increases saliva production), control stress and blood pressure, stop smoking, prepare smaller but more frequent meals, eat slowly. [2, 8, 16] Regular physical activity also has a positive impact on laryngopharyngeal symptoms. [20] Losing weight and sleeping with the head located higher than the rest of the body are believed to be benign factors associated with a smaller intensity of LPR. [27-28]

Proton pump inhibitors (PPIs)

The most common drugs used in LPR therapy are proton pump inhibitors (PPIs). The mechanism of PPIs is associated with their binding to and inhibition of the H+/K+ ATPase pump. [27]. As mentioned previously, the principal role in LPR is the secretion of substances such as bile, pepsin, and trypsin. Relatedly, PPIs might not be effective in laryngopharyngeal reflux, especially in non-acidic and mixed ones. [2, 27]

Formerly, empiric therapy was applied when LPR was suspected. [7, 11, 16] It consisted in administering double doses of PPIs for 8-12 weeks. [16] Afterward, an assessment if there was a clinical improvement was done. Subsequent clinical decisions were made depending on the outcomes. If the symptoms were gone, it was believed that the diagnosis was accurate. [1, 7]. Around 40% of patients using empiric pharmacotherapy did not respond to it. [2, 15, 24] It might have been caused by the wrong diagnosis because as mentioned previously laryngopharyngeal symptoms relate to other pathologies. [1]

Nowadays, if therapy with PPIs is used, it is suggested to administer them twice a day for 2-4 months. This type of treatment is more aggressive. However, in the case of a lack of clinical improvement, a search for other possible reasons for symptoms must be done. [29]

Under the circumstances, 24-hour pH monitoring and other additional examinations such as gastroscopy should be conducted. [1, 24]

Whether using PPIs is efficient in LPR treatment is questionable. Some authors believe that these drugs are not significantly better than placebo. [4, 23] Effectiveness of LPR therapy based on PPIs hovers from 18 to 87%. [9]

It should be mentioned that prolonged treatment with proton pump inhibitors may cause a range of adverse effects such as pneumonia, Clostridium difficile infection, chronic kidney disease, cardiac failure, hypomagnesemia, iron and B12 vitamin deficiency, Alzheimer's disease, osteoporosis and stomach cancer. [4, 9, 23, 27] Additionally, withdrawal of these drugs is associated with a rebound effect, which is an increased secretion of gastric acid. [11]

Surgical treatment

Another therapeutic option in the case of laryngopharyngeal reflux is surgical treatment. Laparoscopic fundoplication involves a reconstruction of the gastroesophageal junction and is used when LPR is not responding to pharmacological therapy associated with a proper diet. [1, 2] In addition, this surgery might be also beneficial in the event of mechanical defects such as a sliding hiatus hernia. [16, 18] However, the efficiency of fundoplication is arguable and fluctuates between 44 to 94%. [1] Before this procedure, it is required to examine the anatomy of the esophagus and exclude possible pathological changes and motor dysfunction. [9] Decisions about performing fundoplication should be made carefully because this surgery is associated with a range of complications. [16, 18] These are dysphagia, emphysema, and intraoperative hemorrhage. [2] On the other hand, a benefit of this procedure is an increase in the regression of Barrett's esophagus. [25]

Magnetic sphincter augmentation (MSA) is another new surgical method and has a similar effectiveness to fundoplication. [14]

Alginates

Alginates perform the function of a mechanical barrier because they cover gastric contents. These drugs also combine with pepsin and bile, thereby reducing their negative effect on mucosa. [4, 15] That is why alginates can be effective in LPR treatment regardless of the type of reflux. [16]

Pizzorni et al.examined the efficacy of therapy with alginate suspension (Gastrotuss®) in comparison to a 20 mg dose of omeprazole. After 2 months they concluded that both drugs had similar effectiveness, so alginates might be an option to reduce the adverse effects of PPIs

treatment. [4] There is a need to do more research with a longer period of observation than 2 months. Alginates are well tolerated by patients and may be used as an adjunct to PPIs or when they are not efficient. [16]

Novel potassium-competitive acid blockers (P-CAB)

Novel potassium-competitive acid blockers (P-CAB) are drugs that should be considered. Kim et al. noticed that 8-week therapy of a 40 mg dose of fexuprazan (P-CAB) resulted in faster improvement of more intensified symptoms such as hoarseness, chronic cough, and respiratory problems than using a 40 mg dose of esomeprazole at the same time. No significant adverse effects associated with fexuprazan therapy were reported. However, this observation period was too short to conclude that complications would not occur later. There are some benefits of using P-CAB. Firstly, these drugs do not need to be taken before meals as do PPIs. Secondly, these medications start to function quicker than PPIs, because they do not need to transform to an active form and inhibit the proton pump after the first dose. [27]

H2 receptor antagonists

H2 receptor antagonists are associated with a shorter time of activity and inhibit the secretion of gastric acid worse than PPIs. That is why H2 receptor antagonists are the second-line drug in LPR treatment. [2, 16]

Prokinetic agents

Currently, there is no evidence that prokinetic agents are efficient in LPR therapy. Itopride should be considered as a supplement to PPIs if patients complain about globus pharyngeus. More research is necessary to confirm the effectiveness of the prokinetic agents in LPR treatment. [28]

Baclofen

Baclofen is an agonist of gamma-aminobutyric receptor type B. The mechanism of its action is associated with a temporary inhibition of relaxation of the lower esophageal sphincter (LES), which can cause a decrease in reflux regardless of its type. [2, 16] Unfortunately, baclofen's usage is limited, because there is no evidence of its efficiency in LPR, and this drug can cause adverse effects. [16] Common complications due to oral baclofen therapy include muscle weakness, nausea, paresthesia, and somnolence. [30]

External Upper Esophageal Sphincter (UES) Compression Device

The new method of LPR treatment which can be effective when therapy with PPIs is not enough, is the External Upper Esophageal Sphincter (UES) Compression Device. Impaired relaxation of the esophagus and UES is observed in patients with typical reflux manifestations and laryngopharyngeal complaints. [2, 16] This device mentioned above can be used for 2-4 weeks to constrict the UES at night, which leads to improvement in patients' symptoms. [2]

Selective serotonin reuptake inhibitors (SSRI)

In the case of chronic cough in resistant LPR selective serotonin reuptake inhibitors (SSRIs) might be efficient. The mechanism of SSRIs in laryngopharyngeal reflux is not fully understood. It is believed that these drugs cause a decrease in the sympathetic nervous system, which results in the loss of relaxation of the esophageal sphincter. [1]

Alternative treatment methods

Cognitive behavioral therapy (CBT), speech therapy, respiratory exercises, and hypnotherapy are alternative methods of LPR therapy. [2, 16] Some data suggest a beneficial impact of breathing and vocal therapy combined with PPIs on dysphonia. [2, 28] It is important to point out the role of appropriate rehydration, massage of the larynx, humming, chewing, and avoiding factors that irritate the larynx. [28] Respiratory exercises activate the abdominal muscles, oral cavity, and pharynx, which might have a positive effect on chronic cough associated with LPR. CBT consists in actions that help with dealing with stress, anxiety, and daily problems, so it may result in a decrease in laryngopharyngeal symptoms. [2] There is data in the medical literature about the benign influence of hypnotherapy on complaints connected with LPR such as dysphagia and globus, which can lead to an overall improvement in the quality of life. [16]

New therapeutic targets

Presently, research about using pepsin inhibitors in LPR treatment is underway. [17] The mechanism of their action consists in the irreversible blockage of pepsin. Additionally, these drugs prevent endocytosis of this enzyme via receptor antagonists. Pepstatin is a strong inhibitor of pepsin, but it is characterized by a low solubility in water and bad pharmacokinetics. [26]

A review of the literature shows other descriptions of the new therapeutic targets such as trypsin inhibitors, antagonists of the protease 2 receptor (PAR-2), NF-κB antagonists, TRPV1 antagonists, and inhibitors of matrix metalloproteinase (MMPIs). [2, 15]

The authors suggest a beneficial effect of these drugs on symptoms connected with LPR. However, in the future, more research should be done on the medications mentioned above.

COMPLICATIONS

Studies have shown that LPR is associated with many other diseases such as chronic pharyngitis, chronic laryngitis, laryngeal contact granuloma, paroxysmal laryngeal spasm, space oedema, vocal cord leukoplakia, vocal cord polyps, subglottic stenosis, glottic laryngeal carcinoma, contact ulcers, chronic cough, asthma, secreted otitis media, sinusitis and sleep apnea-hypopnea syndrome. It can also cause sneezing, runny nose, nasal congestion, a series of similar allergic rhinitis symptoms of throat reflux rhinitis, and pneumonia. [2, 3, 8, 23]

Many studies have shown an association between LPR and laryngeal cancer. Still, it is essential to note that most patients with laryngeal cancer have a history of nicotinism and alcohol abuse. Patients with laryngeal cancer have higher levels of pepsin and bile acids than healthy patients, which may suggest that LPR may cause malignant/premalignant laryngeal lesion formation. [26]

The likely pathogenesis of the commodities above is mucosal damage by the direct action of acidic contents, the influence of pepsin, and the autonomic response, all of which cause swelling and accumulation of mucosal contents, resulting in conditions for the development of infection. [2]

It is not only the reflux that causes complications but also its treatment. In patients operated on for LPR, we can expect dysphagia, usually resolving within 2-8 weeks after surgery, but also prolonged. The second most common complication is bloating, often seen in patients after abdominal surgery. [18]

CONCLUSIONS

Although the accurate incidence of laryngopharyngeal reflux is not clear, it is affecting more and more people. The review of the medical literature shows that there is divergent data on whether LPR is more common in men or women. However, the authors highlight the fact that this disorder usually appears in the 3rd, 4th, or 5th decade of life.

The pathomechanism of laryngopharyngeal reflux is not fully understood. The influence of acid content, bile acids, and pepsin on mucosa is considered. Additionally, increased

stimulation of the vagus nerve might conduce to irritation of the larynx. Among the risk factors are a sedentary lifestyle, smoking, alcohol, coffee, tea, and fried and fatty foods.

Laryngopharyngeal symptoms are not characteristic and occur in many various diseases. Symptoms that are typically observed in GERD might not be that evident in laryngopharyngeal reflux. 24-hour pH monitoring as a gold standard of LPR is debatable. Unfortunately, this procedure has some limitations such as costs or patients' tolerance. Other methods often used in clinical practice are RSI and RFS scales. Pepsin detection in saliva/biopsy specimens appears to be auspicious, but it requires further research.

Treatment of LPR is often a long and complicated process. A very important element of the therapy is diet and lifestyle modification as pharmacotherapy itself does not give such spectacular results. PPIs used until now might not be enough. The literature mentions many other possible therapeutic methods of LPR, however, the gold standard of treatment for every patient with this disease is hard to determine due to varying clinical pictures.

It should be remembered that laryngopharyngeal reflux may be associated with many disparate illnesses, but its most serious possible complication is laryngeal cancer. More subsequent research about the treatment of LPR seems to be necessary because of its rising incidence.

DISCLOSURE

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