Introduction

Gastro-esophageal reflux disease (GERD) is one of the commonest diseases of Western populations, affecting 20 to 30% of adults. Gastroesophageal reflux disease is a well-defined disease characterized by symptoms or complications caused by an abnormal amount of GER, which is a retrograde movement of gastric contents into the esophagus. GERD is multifaceted and the classical esophageal symptoms such as heartburn and regurgitation often overlap with atypical symptoms that impact upon the respiratory system and airways **(Pearson et al., 2011)**.

Laryngopharyngeal reflux (LPR) is a subset of GERD and given its own identity, because the main symptomatic regions are the larynx and pharynx. Accurate diagnosis and effective treatment of LPR has been challenging. Much research has been dedicated to the elucidation of its complex pathophysiology and the development of accurate diagnosis **(Banaszkiewicz et al., 2013)**.

There are three areas of attention in the relationship between GERD and the upper and lower airway. First, the unique evolutionary development of the human aerodigestive tract makes us prone to GER. Second, the composition of the reflux material; not just acid or liquid, but also non-acid or gaseous with the additional presence of pepsin and bile salts. And, third, the histological damage that the reflux material causes in the delicate respiratory epithelium. As a consequence, a series of clinical manifestations develops, related with the inflammatory effects on the upper and lower airway **(Altman et al., 2011)**.

The extra-esophageal reflux disease (EERD) or laryngopharyngeal reflux (LPR), which manifests as chronic cough, laryngitis, hoarseness, voice disorders and asthma. The 'Reflux and its consequences' conference was held in Hull in 2010 and brought together a multidisciplinary group of experts all with a common interest in the many manifestations of reflux disease to present recent research and clinical progress in GERD and EERD including discussion of the nature of the refluxate (acid, pepsin, bile acids and non-acid reflux); mechanisms of tissue damage and protection in the esophagus, laryngopharynx and airways. Clinical conditions with a reflux etiology including asthma, chronic cough, airway disease, LPR, and pediatric EERD were reviewed. In addition methods for diagnosis of reflux disease and treatment strategies, especially with reference to non-acid reflux, were considered **(Pearson et al., 2011)**.

Laryngopharyngeal reflux is associated with symptoms of laryngeal irritation such as throat pain, cough, and voice change. Currently, the two main diagnostic tools are laryngoscopy and reflux monitoring. On laryngoscopy, the signs most commonly used to diagnose LPR are erythema and edema of the larynx; however, these signs are not specific for LPR, may be associated with other causes, and may even be found in healthy individuals. In addition, pH testing has low sensitivity in diagnosing gastroesophageal reflux disease-related laryngeal findings. Proton pump inhibitor (PPI) therapy remains the cornerstone of treatment. The current management recommendation for this group of patients is empiric therapy with twice-daily PPI for 1 to 2 months. In the majority of those who are unresponsive to such therapy, other causes of laryngeal irritation are

considered. Surgical fundoplication is most effective in those who are responsive to acid-suppressive therapy **(Abou-Ismail & Vaezi, 2011)**.

Banaszkiewicz et al., (2013) assessed the prevalence of LPR in children with difficult-to-treat asthma and reported that LPR was diagnosed in 61.9%, there was a positive correlation between LPR diagnosis and the degree of asthma control. The LPR was more frequent in children treated with a higher than lower doses of fluticasone and in those using montelukast compared with non-users. The mean Reflux Symptoms Index score was almost twice greater in children with LPR than in those without it and concluded that the prevalence of LPR in children with difficult-to-treat asthma is substantial.