

**RELATIONSHIP BETWEEN GASTRO-ESOPHAGEAL REFLUX DISEASE AND  
RESPIRATORY DISEASES**

Lydia Ferrara\*

Department of Pharmacy, University of Naples Federico II, Via Domenico Montesano 49, 80131 Naples, Italy.

\*Corresponding Author: Lydia Ferrara

Department of Pharmacy, University of Naples Federico II, Via Domenico Montesano 49, 80131 Naples, Italy.

Article Received on 30/10/2020

Article Revised on 20/11/2020

Article Accepted on 10/12/2020

**ABSTRACT**

The increase in esophageal gastro reflux pathology among the population of all ages, as a result of an unhealthy lifestyle and diet, showed the presence of a more severe symptoms than common digestive symptoms. The purpose of this review was to highlight the relationship between various reflux symptoms and respiratory diseases. Gastro-esophageal reflux disease is determined by a reduced muscle tone of the lower esophageal sphincter (cardias) which causes the gastric content to rise to the esophagus until it reaches the pharynx, oral cavity and airways. This is a pathology that can be present at any age, but especially the elderly and obese patients. When medical therapy and a suitable diet are not sufficient for healing or when extra-digestive symptoms occur, especially of a respiratory character, it is necessary to resort to surgery, conducted in laparoscopy, which consists of a procedure, known as fundoplication, during which a part of the stomach is sutured around the base of the esophagus, exactly where the cardias resides. The purpose of the intervention is to oppose increased resistance to the rise of food towards the esophagus and as a prevention to the appearance of esophagitis.

**KEYWORDS:** Reflux, Pathology, Hiatal hernia, Respiratory syndrome.**INTRODUCTION**

Gastro-esophageal reflux disease is diagnosed in the presence of a recurrent, abnormal ascent into the esophagus of the acid content of the stomach due to the malfunction of cardias, valve located between the esophagus and the stomach, which is tasked with preventing the ascent of food.<sup>[1,2]</sup>

Typical symptoms are multiple: heartburn, acid regurgitation, sore throat, hoarseness, chest pain, wheezing breath dysphagia, and occur in case of obesity, asthma, alcoholism, intake of particularly fatty foods, stress, intake of certain medications.

This pathology is most prevalent in Europe and the United States as a result of modernity, incorrect life styles and dietary behavioral norms. The existence of reflux can already be known to the patient thus helping the doctor on the diagnosis, or be asymptomatic at the esophageal level and therefore more to identify.

In the absence of specific or typical symptoms, there may be recurrent and/or persistent respiratory disorders that tend to be chronicized through the hypertrophy of the lining mucosa of the airways.

Among the population, the elderly are the most affected, and the presence of symptoms increases progressively from the age of 40 with equal tendency for both men and

women. Many elderly people also suffer from dysphagia, a term that indicates the difficulty of passing the foods and drinks from the mouth to the stomach: the causes that may cause difficulty swallowing are multiple and can arise in people of all ages with reference to both oropharyngeal dysphagia and esophageal dysphagia.<sup>[3,4]</sup> In addition to the stomach, therefore, another organ is affected by the inflammatory phenomena of reflux, the esophagus.

Esophagitis is a very common disorder, characterized by inflammation of the esophagus due to excessive ascent of acidic juices from the stomach; more rarely can be caused by infectious diseases, ionizing radiation, allergies, ingestion of particular drugs or corrosive substances.

Eosinophilic esophagitis is an inflammatory state that arises from an increase in white blood cells in esophageal tissue as a result of food-type and non food allergies as in the case of pollen.<sup>[5-7]</sup>

Infectious esophagitis affects individuals with immune system debilitation and is caused by bacterial, fungal or viral agents such as *Candida albicans*.<sup>[8-10]</sup> This type of esophagite can also occur as following prolonged use of antibiotics or in diabetic patients with chronic hyperglycemia.

Esophagitis is a pathology that, even if it does not present severe symptoms, should not be neglected, being able to evolve from a light inflammation to chronic inflammation with narrowing of the esophagus. In fact, the damage caused by stomach acid to the mucosa of the lower esophagus is the production of interstitial tissue that narrows the path of food causing also swallowing problems.

The acid can also wear out the tissues of the esophagus by procuring an open wound, the esophageal ulcer that can bleed, cause pain and make swallowing difficult.

A serious situation is represented, then, by the morphological changes of the tissue that covers the lower esophagus, which takes on the appearance of a gastrointestinal tissue, Barrett's esophagus, with an increased risk of esophageal cancer.<sup>[11,12]</sup>

Gastroesophageal reflux can also be linked to a hiatal hernia, extroflexion of a part of the stomach through an opening of the diaphragm, muscle that supports the lungs and that separates the thoracic cavity from the abdominal one, altering the correct functionality of the cardiac.<sup>[13,14]</sup> This valve opens and closes when food passes and, when it no longer closes well, the content of the stomach pour into the esophagus resulting in regurgitation, acid reflux or belation, if air is also introduced during breathing and swallowing.<sup>[15,16]</sup>

The most frequent symptom of the respiratory system is the nocturnal coughs for laryngo-tracheal suction of the stomach content and the appearance of extra sistoles or tachycardia, especially after meals. Similar to esophagitis, respiratory signs are a complication, sometimes severe, of gastro-esophageal reflux. Presence of a higher volume of reflux and esophageal exposure to reflux over a longer period of time seems to play an important role in inducing coughing, while the acidity of reflux is irrelevant.<sup>[17]</sup>

Coughing occurs when reflux proceeds beyond the esophagus involving the larynx or throat, gastro-laryngeal or gastro-pharyngeal reflux, respectively, resulting in a particular symptomatology dependent on the chemical irritation of these two organs and lesions of their mucous surfaces.<sup>[18]</sup>

Cough caused by acid reflux can be dry or catarrhal and is accompanied by various symptoms. It is often associated with a feeling of pain/burning in the stomach, referred to as pyres, which is felt in the mouth of the stomach or behind the sternum: a persistent pyrosis is indicative of a condition of chronic inflammation of the esophagus and presents with a painful symptomatology to the chest that can simulate a heart attack of the myocardial.

Cough can also be associated with hoarseness, when the inflammation caused by reflux also affects the larynx and

in particular the vocal cords. Patients with chronic laryngitis need to repeatedly "scrape" their throat, trying to get rid of a strange sense of obstruction that they feel and also the need to cough to eliminate the phlegm formed, which changes the voice and makes it hoarse. Repeated scraping of the throat with frequent swallowing also becomes the cause of the introduction into the stomach of a large amount of air that feeds the aerophagia, dyspepsia and belching, all disorders often complained of by these patients. The cough may appear at night as a consequence of the lying position which can favor reflux with progression up to the larynx and the appearance of sudden and insistent dry cough with a feeling of suffocation.<sup>[22-24]</sup>

Some patients who suffer from nocturnal gastroesophageal reflux often have a particular correlation with snoring and obstructive sleep apnea. Patients suffering from asthma, then, complain of the onset of reflux when they are lying down and consequently a decrease in sleep quality, with the appearance of symptoms such as snoring, night sweats, apneas, and often daytime sleepiness. The most important symptom is the total or partial obstruction of the upper airways followed by an increase in intrathoracic pressure which predisposes to the onset of reflux. The, in fact, by making an effort to let air into the lungs, increases the inspiratory effort, causing a rise of the gastric contents towards the stomach.<sup>[25-28]</sup>

Reflux in the newborn is a phenomenon that occurs in the first months of life, when the diet is exclusively liquid, it is usually temporary and in most cases is caused by the poor functionality of a still immature cardiacs.

It can also be accompanied by regurgitation up to the mouth with small food emissions, but it is still a common condition, linked to the liquid diet, the presence of air in the stomach, the excessive speed in drinking by the child or the excessive quantity of food administered and only in rare cases should it be cause for apprehension and alarmism. If, on the other hand, reflux is a persistent problem highlighted by weight loss, recurrent crying, violent vomiting, even with traces of blood, its origin could be due to diseases that require specific treatment such as gastroesophageal reflux disease, esophagitis, allergic gastroenteritis, pyloric stenosis.

It is very important to be able to distinguish simple reflux, more properly regurgitation, a phenomenon that tends to disappear following suitable treatments, from reflux disease that requires medical therapy.<sup>[29-31]</sup>

Recent technological advances allow to detect gastroesophageal reflux by monitoring the esophageal pH, which highlights the level of acidity inside the esophagus and stomach, and also the determination of the pressure of the esophageal sphincter and esophageal motility.<sup>[32]</sup>

## CONCLUSIONS

Gastro-esophageal reflux disease is on the rise in the Western world due to a very stressed lifestyle and poor nutrition. The main cause is the malfunction of the cardias, a valve located between the esophagus and the stomach, responsible for preventing the rise of the food present in the stomach.

Symptoms can be typical, retrosternal burning, acid regurgitation and atypical: difficulty swallowing, nausea, cough, hoarseness, lowering of the voice, hiccups, asthma, insomnia. The treatment of reflux disease is mainly based on lifestyle modification, a suitable diet and drug therapy. Many ailments can be alleviated by leading a quiet life, without strong emotions and stress, dedicating oneself to one's interests without neglecting physical activity.

Diet therapy must be aimed at avoiding relaxation of the tone of the cardias while maintaining intra-abdominal pressure at low levels, the increase of which would cause an increased acid secretion by the stomach.

Meals must be regular, avoiding both excessive quantities and fasting: taking small and frequent meals on a daily basis allows proper digestion and stomach emptying. Especially for patients suffering from respiratory diseases it is very important to control weight gain: the presence of abdominal fat leads to an increase in intra-abdominal pressure which affects the functioning and muscle tone of the cardias which retains less effectively the gastric juices in the stomach with the consequence of their ascent towards the esophagus.

A drug therapy, then, is of valid help to counter the main causes of gastroesophageal reflux: *prokinetic drugs* to accelerate the emptying time of the stomach; *protective drugs of the esophageal mucosa* such as alginates, to counteract the action of acidic stomach juices on the esophageal mucosa; *proton pump inhibitor drugs and H2 receptor antagonists* that buffer gastric acidity or reduce the production of gastric juices, always in order to protect the esophageal mucosa. The recourse to surgery must be well thought out, as it cannot be considered as a definitive resolution of the problem.<sup>[33,34]</sup> Many patients are in fact forced to take antisecretory drugs, perhaps at doses lower, even after surgical correction, which among other things, is not free from post-operative effects, such as difficulty in swallowing, which, especially for elderly patients with breathing difficulties, constitutes a serious danger of suffocation.<sup>[35]</sup>

## Conflict of Interest

The author declares no conflicts of interest.

## REFERENCES

1. Corinaldesi R, Salvioli B, Lioce A, Barbara G, Cremon C, et al Gastroesophageal reflux disease: clinical and pathophysiological features (part I) Clin Ter, 2007; 158(1): 77-83.
2. Lin M, Gerson LB, Lascar R, Davila M, Triadafilopoulos G Features of gastroesophageal reflux disease in women. Am J Gastroenterol, 2004; 99(8): 1442-1447. doi:10.1111/j.1572-0241.2004.04147.x
3. Chan MQ, Balasubramanian G Esophageal Dysphagia in the Elderly. Curr Treat Options Gastroenterol, 2019; 17(4): 534-553. doi:10.1007/s11938-019-00264-z
4. Ortega O, Martín A, Clavé P Diagnosis and Management of Oropharyngeal Dysphagia Among Older Persons, State of the Art. J Am Med Dir Assoc, 2017; 18(7): 576-582. doi:10.1016/j.jamda.2017.02.015
5. Ferreira CT, Vieira MC, Furuta GT, Barros FCLF, Chéhade M.( Eosinophilic esophagitis-Where are we today?. J Pediatr (Rio J), 2019; 95(3): 275-281. doi:10.1016/j.jpmed.2018.06.012
6. Kavitt RT, Hirano I, Vaezi MF Diagnosis and Treatment of Eosinophilic Esophagitis in Adults. Am J Med, 2016; 129(9): 924-934. doi:10.1016/j.amjmed.2016.04.024
7. González-Cervera J, Lucendo AJ Eosinophilic Esophagitis: An Evidence-Based Approach to Therapy. J Investig Allergol Clin Immunol, 2016; 26(1): 8-18.
8. Saeed A, Assiri A, Zaidi Z, Alsheikh A. Fungal Esophagitis in a Child with Insulin Dependent Diabetes Mellitus. J Coll Physicians Surg Pak, 2016; 26(8): 712-713.
9. Riestra Menéndez S, Sleiman Halabi H, Suárez González A, Rodrigo Sáez L. Esofagitis por Candida albicans [Esophagitis caused by Candida albicans. Rev Esp Enferm Apar Dig, 1989; 76(2): 188-193.
10. Mathieson R, Dutta SK.(Candida esophagitis. Dig Dis Sci, 1983; 28(4): 365-370. doi:10.1007 / bf01324956
11. Amadi C, Gatenby P Barrett's oesophagus: Current controversies. World J Gastroenterol.2017; 23(28):5051-5067. doi:10.3748/wjg.v23.i28.5051
12. Xian W, Duleba M, Zhang Y, Yamamoto Y, Ho KY, et al. The Cellular Origin of Barrett's Esophagus and Its Stem Cells. Adv Exp Med Biol, 2019; 1123: 55-69. doi:10.1007/978-3-030-11096-3\_5
13. Gordon C, Kang JY, Neild PJ, Maxwell JD. The role of the hiatus hernia in gastro-oesophageal reflux disease. Aliment Pharmacol Ther, 2004; 20(7): 719-732. doi:10.1111/j.1365-2036.2004.02149.x
14. Yadlapati R, Pandolfino JE Personalized Approach in the Work-up and Management of Gastroesophageal Reflux Disease. Gastrointest Endosc Clin Nord Am, 2020; 30(2): 227-238. doi:10.1016/j.giec.2019.12.002
15. Sfara A, Dumitrascu DL The management of hiatal hernia: an update on diagnosis and treatment. Med Pharm Rep, 2019; 92(4): 321-325. doi:10.15386/mpr-1323

16. Siegal SR, Dolan JP, Hunter JG Modern diagnosis and treatment of hiatal hernias. *Langenbecks Arch Surg*, 2017; 402(8): 1145-1151. doi:10.1007/s00423-017-1606-5
17. Michaudet C, Malaty J. Chronic cough: evaluation and management. *Am Fam Physician*, 2017; 96(9): 575-580.
18. Patel DA, Blanco M, Vaezi MF. Laryngopharyngeal reflux and functional laryngeal disorder: perspective and common practice of the general gastroenterologist. *Gastroenterol Hepatol (N Y)*. 2018; 14(9): 512-520.
19. D'Urzo A, Jugovic P Chronic cough. Three most common causes *Can Fam Medico*, 2002; 48: 1311-
20. Irwin RS, French CL, Curley FJ, Zawacki JK, Bennett FM Chronic cough due to gastroesophageal reflux. Clinical, diagnostic, and pathogenetic aspects. *Chest*, 1993; 104(5): 1511-1517.
21. Johnson D, Osborn LM. Cough variant asthma: a review of the clinical literature. *J Asthma*, 1991; 28(2): 85-90.
22. Perotin JM, Launois C, Dewolf M, Dumazet A, Dury S, et al Managing patients with chronic cough: challenges and solutions *Ther Clin Risk Manag*, 2018; 14: 1041-1051. doi: 10.2147/TCRM.S136036.
23. Ing AJ, Ngu MC, Breslin AB. Pathogenesis of chronic persistent cough associated with gastroesophageal reflux. *Am J Respir Crit Care Med*, 1994; 149(1): 160-167.
24. Waring JP, Lacayo L, Hunter J, Katz E, Suwak B Chronic cough and hoarseness in patients with severe gastroesophageal reflux disease. Diagnosis and response to therapy. *Dig Dis Sci*, 1995; 40(5): 1093-1097.
25. Harding SM Gastroesophageal reflux and asthma: insight into association. *J Allergy Clin Immunol*, 1999; 104: 251-25.
26. Klink M, Quan SF. (Prevalence of reported sleep disturbances in a general adult population and their relationship to obstructive airways disease. *Chest*, 1987; 91: 540-546.
27. Lin CC, Lin CY Obstructive sleep apnea syndrome and bronchial hyperreactivity. *Lung*, 1995; 173: 117-126.
28. Caparroz F, Campanholo M, Stefanini R, Vidigal T, Haddad L, et al Laryngopharyngeal reflux and dysphagia in patients with obstructive sleep apnea: is there an association? *Sleep Breath*, 2019; 23(2): 619-626. doi: 10.1007/s11325-019-01844-0.
29. Vandenplas Y, Hauser B An updated review on gastro-esophageal reflux in pediatrics. *Expert Rev Gastroenterol Hepatol*, 2015; 9(12): 1511-1521. doi:10.1586/17474124.2015.1093932
30. Jones A. B. Gastroesophageal reflux in infants and children. When to reassure and when to go further. *Canadian family physician Medecin de famille canadien*, 2001; 47: 2045-2053.
31. Barnhart DC Gastroesophageal reflux disease in children. *Semin Pediatr Surg*, 2016; 25(4): 212-218. doi:10.1053/j.sempedsurg.2016.05.009
32. Lightdale JR, Gremse DA Section on Gastroenterology, Hepatology, and Nutrition. Gastroesophageal reflux: management guidance for the pediatrician. *Pediatrics*, 2013; 131(5): 1684-1695. doi:10.1542/peds.2013-0421
33. Tan G, Yang Z, Wang Z, Meta-analysis of laparoscopic total (Nissen) versus posterior (Toupet) fundoplication for gastro-oesophageal reflux disease based on randomized clinical trials, *Anz J Surg*, 2011; 81(4): 246-52.
34. Sura, L., Madhavan, A., Carnaby, G., & Crary, M. A. Dysphagia in the elderly: management and nutritional considerations. *Clinical interventions in aging*, 2012; 7: 287-298. <https://doi.org/10.2147/CIA.S23404>
35. Frazzoni M, Conigliaro R, Melotti G Reflux parameters as modified by laparoscopic fundoplication in 40 patients with heartburn/regurgitation persisting despite PPI therapy: a study using impedance-pH monitoring. *Dig Dis Sci*, 2011; 56(4): 1099-1106. doi:10.1007/s10620-010-1381-4