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(REVIEW ARTICLE)

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Impact of Gastroesophageal Reflux Disease (GERD) on the Dorsum of the Tongue and Gustatory Sensitivity: A Review Article

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Abstract

Background: Gastroesophageal Reflux Disease (GERD) is a chronic gastrointestinal disorder that may extend beyond the esophagus, affecting oral tissues, particularly the tongue.

Objective: This review analyzes the impact of GERD on the dorsum of the tongue and its association with altered gustatory function, notably dysgeusia.

Methods: A descriptive qualitative literature review was conducted by analyzing eleven scholarly sources retrieved from PubMed and other journal databases.

Results: The review found that GERD-induced acid exposure can reach the oral cavity, leading to inflammation of the dorsum of the tongue and impairment of taste receptor function.

Conclusion: GERD contributes to gustatory disturbances through acid-related irritation of the tongue's dorsal surface. Lifestyle modifications and medical management of GERD are essential to prevent dysgeusia and preserve oral sensory health.

Keywords: Gastroesophageal Reflux Disease (GERD); Dorsum of the tongue; Dysgeusia; Gustatory function

1 Introduction

Gastroesophageal Reflux Disease (GERD) is a chronic condition marked by the backflow of acidic gastric contents into the esophagus, causing heartburn and regurgitation [1]. The persistence of reflux can lead to esophageal inflammation and, in severe cases, increase the risk of esophageal cancer [2]. The tongue, particularly its dorsal surface, serves as a major microbial habitat and is susceptible to acid-induced changes [3]. This review examines how GERD influences tongue morphology and gustatory sensitivity.

2 Materials and methods

This study employed a descriptive qualitative literature review approach. Data were collected from PubMed, Scopus, and other reputable journal repositories. Eleven peer-reviewed articles published between 2019 and 2022 were selected based on relevance to GERD and taste disorders. Data were analyzed thematically to identify recurring physiological mechanisms connecting GERD with oral sensory dysfunction. Ethical approval was not required as the study relied solely on secondary data.

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3 Results and discussion

Gastroesophageal reflux disease (GERD) is caused by the weakening of the esophageal sphincter, the muscular structure that separates the esophagus from the stomach [1]. When this sphincter becomes incompetent, gastric contents and acid can reflux into the esophagus. Repeated exposure of the esophageal lining to refluxed gastric acid leads to irritation and inflammation [2]. The esophageal sphincter is a specialized muscle that prevents the backflow of stomach contents into the esophagus. Under normal conditions, this muscle remains contracted to maintain a barrier against reflux and relaxes only to allow food to pass into the stomach [3]. Heartburn occurs when the sphincter weakens and fails to close properly, allowing gastric fluids and contents to ascend into the esophagus [4].

Consumption of acidic, spicy, or high-fat foods can increase gastric acid production, weaken the lower esophageal sphincter, and delay gastric emptying [5]. Alcohol and caffeine-containing beverages are also known triggers of GERD symptoms. Poor eating habits similarly contribute to the development of GERD [6]. Behaviors such as eating too quickly, consuming large meals at once, and lying down immediately after eating can elevate intra-abdominal pressure and exacerbate reflux. Age is also an important contributing factor, as the prevalence of GERD—whether mild or severe—tends to increase after the age of 40 [7].

Several GERD-related symptoms may affect taste perception. Acid reflux can produce a burning sensation or irritation in the tongue and oral cavity, potentially impairing the tongue's ability to accurately detect taste stimuli [8]. The most common symptom of GERD is a burning sensation in the chest. However, patients may also experience nausea, a bitter taste in the mouth, dental caries, chronic cough, sore throat and hoarseness, regurgitation, odynophagia or dysphagia, and halitosis [9]. A bitter taste in the mouth is one of the symptoms associated with dysgeusia, which may occur due to a decrease in gastrointestinal pH that affects the papillae on the dorsum of the tongue and leads to reduced taste sensitivity [10].

Under normal circumstances, the tongue can perceive sweet, salty, bitter, sour, and umami tastes [1]. However, in individuals with dysgeusia, the tongue may register unpleasant sensations such as sour, bitter, or even metallic tastes [2]. These abnormal sensations may occur even in the absence of any oral activity. Such disturbances can significantly diminish the enjoyment of eating, and unpleasant tastes may arise spontaneously at any time [3]. When gastric acid associated with GERD ascends into the oral cavity, it can lead to the dissolution of dental structures and injury to the soft tissues of the mouth [4]. Such damage may impair normal oral functions, including taste sensitivity. As refluxed acid reaches the mouth, the small projections on the dorsum of the tongue (papillae) may become irritated, resulting in difficulties with speaking, chewing, swallowing, and perceiving taste [5]. Consequently, patients may experience a persistent bitter or sour sensation on the tongue. These alterations can precipitate the development of dysgeusia [6].

Dysgeusia is a condition characterized by disturbances in taste perception [7]. Individuals with dysgeusia experience alterations or impairments in their ability to accurately detect the taste of food. The condition may cause food to taste bitter, metallic, or unusually unpleasant [8]. In some cases, individuals report that foods which normally have distinct flavors become tasteless [9]. Dysgeusia can arise from a variety of factors. Upper respiratory tract infections or sinus infections may interfere with the function of gustatory receptors, leading to taste disturbances [10]. Gastrointestinal disorders such as GERD, as well as hepatic dysfunction, can also contribute to altered taste perception [1]. Certain medications—including antibiotics, chemotherapeutic agents, antihypertensive drugs, and nonsteroidal anti-inflammatory drugs (NSAIDs)—are known to cause dysgeusia as a side effect [2]. Nutritional deficiencies, particularly of iron, zinc, or vitamin B12, may further predispose individuals to taste impairment [3].

In addition, radiotherapy or chemotherapy involving the head and neck region can induce dysgeusia [4]. Neurological disorders such as stroke, multiple sclerosis, and peripheral neuropathy may also affect tongue function and result in altered taste [5]. It is important to note, however, that taste disturbances do not occur in all individuals with GERD. Symptoms and associated effects vary widely among patients [6].

4 Conclusion

GERD significantly affects oral health, particularly the dorsum of the tongue, leading to gustatory dysfunction. Early diagnosis and management through pharmacological therapy and lifestyle modification can minimize complications like dysgeusia and improve patients 'quality of life.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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