

PEPTEST AND INJURIES TO THE HARD TISSUES OF THE ORAL CAVITY: A PROSPECTIVE STUDY

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ABSTRACT

Introduction: The aim of the study is to evaluate the correlation between the presence of pepsin in saliva and dental erosion in patients with GERD.

Materials and methods: 100 adult patients with typical GERD symptoms have been tested with the salivary pepsin test (PEPTEST) which was used to assess the presence of pepsin in saliva and, therefore, for the diagnosis of GERD. The presence and the localization of dental erosion was evaluated through a dental examination.

Results: In 52% of the patients the PEP test was positive. It was shown that out of 52 patients with gastroesophageal reflux disease, 16 (30%) had dental erosions, while in the remaining 48 healthy subjects only 4 patients (8%) showed dental erosions.

Conclusions: The results showed a positive correlation between the presence of pepsin and dental erosion. A multidisciplinary approach between the gastroenterologist and the dentist is very important in order to plan and implement the most suitable therapeutic strategy that aims to restore a state of health of all the anatomical districts concerned.

Keywords: Gastroesophageal reflux disease, GERD, Pepsin, Oral lesions, Palate.

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Introduction

Dental erosion is defined as a progressive and irreversible loss of the hard tissues of the tooth, due to a chemical process that does not involve bacteria⁽¹⁾. Both endogenous (intrinsic) and exogenous (extrinsic) acid are responsible for the increased incidence and high prevalence of dental erosion, and dental sensitivity observed in many countries, in both children and adults. Not only dental erosion from endogenous acid is more severe than that from exogenous acids, but gastric reflux, regurgitation and microaspiration can have significant negative repercussions on the esophagus and oropharynx mucosa

and respiratory system^(2,3). Numerous clinical conditions can cause erosive lesions of the dental tissues, including gastroesophageal reflux disease (GERD), characterized by the ascent of gastric juices from the stomach into the oral cavity.

Other GERD-related symptoms could include dysphonia or a sense of foreign body, frequently leading to considering different comorbidities, including tumors, in the differential diagnosis^(4,5).

Schroeder et al. in 1995 demonstrated through the measurement of PH in the proximal and distal esophagus, the direct connection between (GERD) and dental erosion⁽⁶⁾. However, there are wide divergences in the literature regarding the prevalence of these

dental lesions in patients with (GERD). In fact, in some studies it was found that, compared to the control group, the percentage of dental erosion was significantly higher in the gastroesophageal reflux disease group (12.5 vs 47.5%, $p < 0.001$, chi2 test), thus such as the number and severity of dental erosions⁽⁷⁾. On the other hand, Ranjitkar et al., do not show significant associations between (GERD) and dental erosion⁽⁸⁾. To reduce the effect of this phenomenon on dental tissues, primary prevention protocols are implemented: educational, such as lifestyle changes, dietary changes; secondary prevention: pharmacological (gastric acid buffering agents, and gastric anti-secretory agents), use of topical fluoride, restorative treatments in order to decrease dental sensitivity, and restore dental anatomy⁽⁹⁾.

Primary extraoral pathologies can secondarily involve the dental tissues, and therefore clinicians must observe the lesions of the oral cavity to early intercept systemic pathologies, such as dental erosions associated with gastroesophageal reflux. This allows to improve the prognosis of dental treatment, through a multidisciplinary approach starting from a careful medical history and an accurate objective examination⁽¹⁰⁻¹³⁾. In the current context in which none of the diagnostic tests in use prove to be a safe tool in the recognition of gastroesophageal reflux disease⁽¹⁴⁾, the search for pepsin inside the saliva may constitute a possible method of effective diagnosis. The aim of this work is to first identify the diagnostic value of salivary pepsin in the diagnosis of GERD, and subsequently to determine the correlation between test positive patients and oral lesions.

Material and methods

We conducted a prospective study in the ENT section of the University Catania Hospital, between January 1, 2019 and February 1, 2020. GERD evaluation was performed through a specific tool: Pepsin salivary test⁽¹⁵⁾ (PEPTEST, RDBiomed Limited). The test evaluates the presence of pepsin in saliva, commonly not present in oral secretions but increased in patients suffering from GERD. Pepsin is a protein degrading enzyme present in the stomach and small intestine in the form of pepsinogen and activated by hydrochloric acid into pepsin. The enzyme's identification in the oral cavity expresses the presence of stomach gastric contents, thus allowing diagnosing GERD. We enrolled 100 adult patients suffering from retrosternal burning, aging from aging from 18 to 70 years old, and subjected to pepsin

salivary test fasting and after normal oral hygiene practice at morning). Test results were achieved about 15 minutes after the execution. Subsequently, a dental examination was administered by the same dentist to evaluate hard and soft tissues of the oral cavity and correlate the data with PEP test outcomes.

Results

Through PEP test we differentiated 52 subjects with GERD while 48 negative healthy ones. Based on the preliminary objective examination, 16/52 (30%) patients with GERD presented dental erosions, 10 (20%) to soft tissues lesions (periodontitis, gingivitis, erythema of the palate, and glossitis), 10 (20%) dental erosions and soft tissue lesions while 16 (30%) no lesions. In contrast, among healthy subjects 4/48 (8%) reported dental erosions, 2 (4%) soft tissue lesions while 42 (88%) no lesions.

Discussion

Oral lesions's diagnosis could be very difficult both in adults than children⁽¹⁶⁻¹⁹⁾. Differential diagnosis should consider several different disorders, from infection-induced lesions to neoplasms⁽²⁰⁻²²⁾. A recent systematic review on GERD and dental erosion found a strong association between the two conditions⁽²³⁾. The median prevalence of dental erosion in GERD patients was 24%, and the median prevalence of GERD in adults and children with dental erosion was 32.5% and 17%, respectively. Moreover, strong associations between oral and palatal surgery were found in hard tissues lesions development⁽²⁴⁻²⁶⁾.

Several authors reported in literature a higher prevalence of dental erosion, asthma, pneumonia and sinusitis in children with GERD compared to healthy controls^(16,26). However, a large case-control study reported no significant associations between GERD and dental erosion or tooth sensitivity, but significant associations between GERD and xerostomia, oral acid / burning sensation, subjective halitosis, and erythema of the palatal mucosa and uvula⁽²⁷⁾. Additionally, a randomized clinical trial showed quantitatively short-term suppression of active dental erosion following treatment of medically confirmed GERD with a proton pump inhibitor (PPI)⁽¹⁷⁾. Intraesophageal refluxes contain a mixed composition of gas and liquid associated with GERD symptoms could led to endogenous tooth erosion^(28,29).

A recent clinical study including 88 subjects with GERD reported significantly higher dental ero-

sions and respiratory symptoms compared to healthy subjects. Palatal erosion of the maxillary incisors was found in 80% of patients with frequent respiratory symptoms such as chronic cough, laryngitis and asthma, comporting significantly high orotracheal risk intubation⁽³⁰⁻³²⁾. Strong associations have been reported between GERD and asthma⁽³²⁾, and between asthma and dental erosion⁽³³⁾.

The different ages and exposure's time to acids among the subjects could explain the variability of the oral pathologies found. Dental erosion is a multifactorial pathology that occurs more frequently in elderly subjects, but also associated with frequent food use, drink, and acid drugs, but above all with exposure to acid agents of endogenous origin. Our study demonstrated a considerably lower number of lesions in healthy subjects than GERD. Furthermore, the different lesions location could be due to different etiological causes. GERD subjects presented lesions mainly in the lingual and palatal areas, while healthy subjects present heterogeneous localization. Localized lesions are noted on the labial surfaces of the anterior teeth, the buccal surfaces of the posterior teeth and the occlusal surfaces of the molars.

Conclusion

Our study suggests a strong correlation between gastroesophageal reflux disease and lesions of the hard and soft tissues of the oral cavity. The dentist plays a very important role in identifying early this type of oral lesions, giving the signs of a systemic pathology. A careful and scrupulous localization of the lesions, therefore, helps us to be able to distinguish the causes.

It is clear that a multidisciplinary approach between dentistry, gastroenterologist and otolaryngologist is considered desirable to plan and implement the most suitable therapeutic strategy that aims to restore a state of health of all the anatomical districts concerned.

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