

Letter to the Editor***Corresponding author**

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Parotitis at the End-of-Life

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Dear Editor,

Saliva plays a key role in maintaining physiological homeostasis of the oral cavity and its estimated daily production is of about 500-600 mL/day.¹ Xerostomia is defined as the subjective feeling of dry mouth caused either by changes in the saliva consistency, or by the acute reduction of its production, by 50% or more.² Its prevalence varies among 14% and 72%,¹ and it is most common in polymedicated elder patients, when in a state of dehydration and/or malnutrition. It is also associated to multiple comorbidities such as renal failure, hepatic failure, hypothyroidism, diabetes mellitus and depression.³ The use of drugs with anticholinergic and diuretic effects can lead to dehydration and to the consequent increase of the prevalence of xerostomia. The most commonly implicated drugs are antidepressants, anticholinergics, sedatives, antipsychotics, antiepileptic, anti-parkinson drugs and antihistamines, diuretics and anti-hypertensives.^{1,3,4} There are numerous secondary complications to xerostomia such as dysphagia, taste alterations, lesions of the oral mucosa, local pain and oropharyngeal infections.¹

Parotitis is the most common form of salivary gland infection. Parotids are the glands most often involved and its inflammation is called parotitis. The location of these gland channels, along the upper jaw, leads to salivary stasis, contrary to what occurs with sublingual and submandibular glands. On the other hand, the saliva produced by the parotid gland is more serous in comparison to the one produced by sublingual and submandibular glands, which consists of mucous material, rich in immunoglobulins. These mechanisms are responsible for the occurrence of parotitis, once they lead to the stasis of the salivary flow, as they also retrograde contamination by bacteria from the oral cavity.³ In elderly patients facing the end-of-life, there's an increasing prevalence of parotitis due to the existence of multiple risk factors, such as malnutrition, poor dentition, multiple comorbid conditions and consequent polymedication.^{3,4}

The treatment of parotitis is always adjusted to the patient, and consists of a wide range of practices such as hydration, withdrawal of diuretic or anticholinergic drugs, the usage of nonsteroidal anti-inflammatory drugs, and the administration of antibiotics, when there is a suspicion of a bacterial infection. There are certain measures that help to prevent xerostomia and consequently parotitis, such as: the use of substances that increase salivary secretion, like lemon drops, optimization of oral hygiene, lubrication of the jugal mucosa and local application of warm compresses. An improvement is expected up until 48 hours after the treatment onset.^{3,4}

We identify four elder patients with parotitis, hospitalized in a palliative care unit (PCU). The four identified patients were elder, with an average age of 77.6 years. Three of those were male patients. Most of them had a degree of completely dependence (mean Barthel scale score: 21.3 range 0-100) and the mean extension of hospital stay was of 16.3 days. Cancer was the main diagnosis in all (100%) of the referred patients and the major cause for the internment was symptomatic control at the end-of-life. They had on average 4 comorbidities and only one patient was under palliative chemotherapy.

Parotitis was diagnosed between the 6th and 14th day of hospitalization. Every individual patient had been prescribed with at least three potential drugs involved in its etiology, such as clonazepam, mirtazapine, midazolam, levomepromazine, haloperidol, butylscopolamine, hydroxyzine, furosemide, and perindopril. They all showed clinical improvement after

Table 1: Characteristics of the Study Population.

	Patient 1	Patient 2	Patient 3	Patient 4
Gender	Male	Male	Male	Female
Age (years)	72	80	70	89
Barthel scale Score (0-100)	Total dependence 0	Total dependence 15	Mild dependence 50	Severe dependence 20
Days of hospitalization	13	15	16	21
Main diagnosis	Pancreas cancer	Lung cancer	Prostate cancer	Peritoneal metastases (unknown primary tumor)
Comorbid conditions	AHT [†] , type 2 diabetes, Dyslipidemia, Coronary disease	CKD [‡] , AHT [†] , type 2 diabetes, POCD [§] , PBH [¶] , Glaucoma	AHT [†] , DVT [¶]	Type 2 diabetes, CKD [‡] , Depression
Prescription drugs	Butylscopolamine, Clonazepam, Hydroxyzine and Levomepromazine	Butylscopolamine, Clonazepam, Furosemide and Haloperidol	Clonazepam, Furosemide and Mirtazapine	Butylscopolamine, Haloperidol and Midazolam
Diagnosis Day	8 th	6 th	10 th	14 th
Palliative chemotherapy	Yes	No	No	No
Antibiotic	No	No	Yes	yes
Death	Yes	Yes	No	No

[†]: arterial hypertension; [‡]: Chronic Kidney disease; [§]: pulmonary obstructive chronic disease; [¶]: Prostatic benign hyperplasia; [¶]: Deep vein thrombosis.

the discontinuation of the above drugs, followed by the introduction of general measures and a treatment with nonsteroidal anti-inflammatory drugs and/or antibiotics. Nevertheless, parotitis was a terminal condition within 5 days of diagnosis, and 75% of patients died. Table 1 portrays the characteristics of the study population. We establish that all patients suffered from an oncological disease. In the other studies, this condition appears as a main diag these clinical cases, all patients were elder, following the same tendency as the population nosis in only about 60% of cases.^{3,4} In these clinical cases, all patients were elder, following the same tendency as the population of the published studies.³⁻⁵ This is related to the high prevalence of parotitis on the elderly, at the end-of-life, once they have multiple risk factors. Additionally, comparing to previous publications, the mortality rate was higher in this case series. This is probably due to our short sample but reveals the parotitis poor prognosis. The multiple comorbidities had a negative impact, contributing to the onset of parotitis and to a short-term adverse outcome. Also, note that the prescribed antibiotherapy does not linearly favor the resolution of the clinical situation.

Parotitis is associated with active dying and produces discomfort for the patient. There are few studies published on this topic, but it is estimated that the mortality rate reaches about 50% after its diagnosis.³ Parotitis is a marker of poor prognosis, directly related to the principal diagnosis and to the associated comorbidities, which affect the patients' vulnerability to the use of drugs directly responsible for xerostomia.

There are certain measures that help preventing xerostomia and, thus, the emergence of parotitis, such as the use of substances increasing salivary secretion, the optimization of oral hygiene, the lubrication of the oral mucosa, and the local applica-

tion of hot lint.¹

The authors conclude that hydration, proper oral hygiene and judicious use of drugs with anticholinergic and/or diuretic effects can contribute to the reduction of the prevalence of parotitis at the end-of-life. It is essential to implement preventive measures to avoid this serious complication that induces great suffering to the patient. It is necessary to observe an excellent mouth care in this group of patients, particularly when anticholinergic drugs are used to control other clinical symptoms at the end-of-life.

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All authors contributed equally to the work.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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