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Original research article

Products based on olive oil, betaine, and xylitol in the post-radiotherapy xerostomia



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ABSTRACT

Aim: The objective of this study was determining if the use of products based in olive oil, betaine and xylitol are efficacious to decrease the impact of the dry mouth in the quality of life of the patients with xerostomia due to radiotherapy treatment.

Background: Following therapeutic irradiation of the head and neck, patients with profound xerostomia have complaints associated with oral dryness, speech, and taste. There is no strong evidence that any topical therapy is effective for relieving the symptom of dry mouth. **Material and methods:** 40 patients who had been treated with radiotherapy for head and neck carcinoma and reported symptoms of dry mouth were included in the study. A xerostomia-related quality of life questionnaire, visual analogue scale questionnaire for subjective assessment of salivary dysfunction and salivary flow were reported before and 15 days after the use of topical products based on olive oil, betaina and xylitol.

Results: The four primary quality of life areas demonstrated significantly greater improvement after the use of topical products and all eight VAS items had favourable changes. The reduction of symptoms was statistically significant in 7 of the 8 items. After the use of the products, there were improvements in salivary flow in 45%.

Conclusions: The use of products based on olive oil, betaine and xylitol, shaped like collutory, toothpaste, gel and spray significantly improved most symptoms and the quality of life limitations produced by dry mouth in patients treated with radiotherapy.

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1. Background

Xerostomia is the most frequent complication among patients who receive radiotherapy for oral cancers. A reduction in the salivary flow rate and the decrease of its pH is paralleled with a change in saliva competence and shifting of oral microflora to cariogenic bacterial species.¹ Therefore, difficulties in speech, mastication, swallowing, changes in taste, dental caries, burning sensation, microbial infections and a compromised quality of life are associated with the presence of xerostomia.²

Studies have led to three therapeutic approaches for the treatment of xerostomia: prevention, stimulation and symptomatic treatment. Prevention is not always possible, although intensity modulated radiation therapy (IMRT) gives the ability to deliver lower doses of radiation to the parotid glands. According to published results, IMRT improves the toxicity profiles, but xerostomia does not disappear.³ Saliva stimulating agents such as cholinergic agonists have all demonstrated some ability to improve xerostomia; however, they all have side effects and are contraindicated for certain medical disorders.⁴ There is a huge variety of products to relieve dry mouth symptoms such as chewing gums, sugar free lozenges, salivary substitutes, moisturizers and toothpastes. A Cochrane review concluded that there is no strong evidence that any topical therapy is effective for relieving the symptom of dry mouth and more studies are required to provide evidence to guide clinical care.⁵

A previous study report that the daily use of topical dry mouth products containing olive oil, betaine and xylitol is safe and effective in relieving symptoms of xerostomia in a population with polypharmacy-induced xerostomia.⁶ Olive oil is a lubricant that decreases the effects in the mucous produced by a lack of saliva and inhibits bacterial growth.⁷ Betaine, a naturally-occurring amino acid, maintains humidity and protects from irritation.⁸ Xylitol is a valuable tool in combating dental caries.⁹ Other components of these topical products are vitamin E to reduce the irritation of the mucous, fluoride, calcium and allantoin. These products are sodium lauryl sulfate free.

2. Aim

The objective of this study was to test if the use of the products based on olive oil, betaine and xylitol are effective in decreasing the impact of dry mouth in the quality of life in patients with xerostomia due to radiotherapy. The secondary objective was to prove if there is an improvement in salivary flow after the topical application of the aforementioned products over 15 days.

3. Patients and methods

40 patients were included in the study. Some of them were recruited by phone and others during a routine visit. Topical dry mouth products used in this investigation were toothpaste, mouthrinse, spray and gel, containing olive oil, betaine and xylitol (Xerostom[®] products). All subjects had been treated with radiotherapy for head and neck carcinoma

and reported symptoms of dry mouth. The patients were instructed to use the toothpaste 3 times a day after main meals, using the gel around the gums, rinsing with the mouthwash and the spray whenever they felt they needed them but at least 8 times in total.

The criteria of inclusion in the study were:

1. Patients must be over 18 and have been treated with radiotherapy for head and neck carcinoma.
2. Patients with dry mouth symptoms, regardless of their salivary flow.
3. Patients willing to use the products as instructed.
4. Patients willing to answer xerostomia-related quality of life and visual analogue scale questionnaires.
5. Patients who signed the informed consent form.

The criteria of exclusion were:

1. Patients with Sjogren's syndrome.
2. Patients unable to administer appropriately the products, and or unable to understand the consent form.
3. Patients that have taken pilocarpine or cevimeline in 7 days preceding the study.
4. Patients that make provisions for an oral surgery in the course of study.
5. Patients with medical pathologies that require changes in medication.
6. Patients excluded during the study by some medical problem.

4. Basal measures

4.1. Salivary flow

In order to measure salivary flow rate, unstimulated saliva was collected by direct emission into a plastic glass. Saliva was weighed with high precision scales. Patients did not drink, perform oral hygiene, or smoke for at least 90 min before. Salivary flow above 0.25 ml/min was considered normal. Different grades of salivary flow are recorded in [Table 1](#).

4.2. Xerostomia-related quality of life questionnaire

A 15-question validated xerostomia-related quality of life questionnaire was used. The questions refer to how dry mouth affects the quality of life in four major domains:

Physical function:

1. My mouth/throat dryness limits the kinds or amounts of food I eat.
6. My mouth/throat dryness makes me uncomfortable speaking in front of other people.

Table 1 – Grades of salivary flow.

Grade	Salivary flow (ml/min)
1	0.25–0.2
2	0.2–0.1
3	<0.1

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