



Question: Can pilocarpine eye drops be used to treat dry mouth?

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Summary

- Pilocarpine is not recommended as a first line treatment for dry mouth (xerostomia). However, saliva stimulants are generally more effective than saliva substitutes (*unless a main salivary duct is blocked*)¹, and are preferred by patients.² Other saliva stimulants such as sugar-free chewing gum should be tried prior to the initiation of pilocarpine.
- Pilocarpine tablets (Salagen®) are unlicensed in Ireland but are licensed in the UK for the treatment of dry mouth following irradiation for head and neck cancer and for patients with Sjögren's syndrome.³
- There is limited information available to support the oral use of pilocarpine eye drops as an alternative. The use of pilocarpine eye drops to treat a dry mouth is unlicensed.
- For cost/reimbursement reasons, pilocarpine eye drops administered orally are favored over the use of Salagen® oral tablets (unlicensed).
- A recommended dose of 5mg - 10mg three times daily of oral pilocarpine tablets is approximately equivalent to pilocarpine 4% w/v, 3 - 5 drops (6mg-10mg) taken orally three times daily.¹⁻⁶

Palliative Meds Info: Terms and Conditions

The information outlined above is intended for healthcare professionals only. The information outlined above is believed to accurately reflect the medical literature at the time of writing. Healthcare professionals must use their own judgment to determine the accuracy and relevance of the information. See www.olh.ie for full terms and conditions.

Availability

Pilocarpine tablets are indicated for the treatment of dry mouth following irradiation for head and neck cancer and for dry mouth and dry eyes in Sjogren's syndrome.^{3,4,5,6} Unfortunately, pilocarpine tablets are not licensed in Ireland. Salagen® (pilocarpine) 5mg tablets are available to order from wholesalers, but their cost is prohibitive, and they are not reimbursed for patients in the community.⁷ Pilocarpine 2% w/v and 4% w/v eye-drops are licensed in Ireland, and covered under the General Medical Scheme (GMS) and the Drug Payment Scheme (DPS). Though not licensed for the management of dry mouth, they represent a more cost effective choice of product for managing this indication in palliative patients in Ireland.^{8,9}

Place in Therapy

The Palliative Care Formulary (PCF) advises that unless a patient's main salivary duct is known to be blocked, a saliva stimulant is the preferred initial treatment for the management of dry mouth.¹ According to this reference source, artificial saliva is a poor substitute for natural saliva.¹ Chewing gum acts as a saliva stimulant and is an effective initial choice for patients with dry mouth. The gum should be sugar-free and, in patients with dentures, low-tack, e.g. Orbit®.¹⁰ For patients who do not respond to such measures, oral pilocarpine should be trialled, unless otherwise contraindicated (see below).

Mechanism of Action

Pilocarpine is a parasympathomimetic (predominantly muscarinic) drug with mild adrenergic activity which stimulates secretion from exocrine glands, including salivary glands.³ About 90% of patients with drug-induced dry mouth respond to pilocarpine with benefit seen immediately.¹⁰ Pilocarpine can reportedly increase salivary flow 2 to 10 fold.²

Recommended Dose

Palliative reference sources advise that each drop* of 4% w/v pilocarpine eye-drops contain the equivalent of 2mg of oral pilocarpine.^{2,10} Based on this information, we can hypothesize that each drop of 2% w/v pilocarpine eye-drops will contain the equivalent of

1mg of oral pilocarpine. Initiating therapy using three drops of pilocarpine 4% w/v eye-drops orally three times daily has been recommended.¹⁰

*Importantly, the drop size may vary, depending on the product used. In the absence of specific information relating to drop size, doses should always be titrated according to patient tolerance and response to pilocarpine.

➤ **Xerostomia following irradiation for head and neck cancer.**

- The recommended initial dose for adults is 5 mg three times daily.^{3,4}
- The maximum therapeutic effect is normally obtained after 4 to 8 weeks of therapy.⁴
- For patients who have not responded sufficiently after 4 weeks and who tolerate the dose of 5 mg three times daily, doses of up to a maximum of 30 mg daily may be considered.^{3,4}
- The Palliative Care Formulary (PCF) advises that the dose may be increased up to 10mg four times daily where there is an insufficient response after four weeks.¹⁰
- Therapy should be discontinued if no improvement in xerostomia is noted after 2 to 3 months of therapy.^{3,4,10}

➤ **Treatment of symptoms of dry mouth and dry eyes in patients with Sjögren's syndrome.**

- The recommended initial dose is 5 mg four times daily.³
- If this dose is tolerated but response is insufficient, it can be increased to a maximum of 30 mg daily in divided doses.^{3,10}
- Treatment should be discontinued if no improvement is noted after 2 to 3 months of therapy.^{3,4}

➤ **Treatment of drug-induced dry mouth**

- Medications with the potential to cause dry mouth should firstly be assessed in terms of their role in therapy and the potential for treatment alternatives, and rationalized where possible.

- The PCF advises a starting dose of 5mg three times daily, or 6mg three times daily if using a 4% w/v pilocarpine eye drop solution¹⁰.
- The onset of action in drug induced dry mouth is approximately 20 minutes.¹⁰
- If necessary and if tolerated, increase the dose to 10mg four times daily, after two days. If there is no improvement with 10mg four times daily, stop after 4 days.¹⁰ The PCF advises that in drug induced dry mouth, 5mg four times daily is generally an effective dose.¹⁰

Dose adjustments

Doses of oral pilocarpine should be reduced in patients with moderate to severe hepatic impairment. Licensed information suggests that the starting dose of pilocarpine should be reduced to 5mg twice daily in patients with moderate hepatic impairment (Child-Pugh category B) and avoided in patients with severe impairment (Child-Pugh category C).^{2,5} The dose may gradually be increased to 5 mg three times daily if tolerated.^{2,5}

Administration Guidelines

The manufacturer recommends that Salagen® tablets should be given during or directly after meals^{3,10}. However, given its duration of action (3–5h), there is scope for greater flexibility, particularly in the setting of palliative care.¹⁰ Adding a dose at bedtime reduces the likelihood of the patient waking in the night with an excessively dry mouth.¹⁰

Contra-indications

Bowel obstruction^{2,10}, narrow angle glaucoma² and uncontrolled asthma or COPD (increased airway resistance) are contra-indications to the oral use of pilocarpine.^{2,3,6}

Cautions and Adverse Effects

Undesirable effects are common with the oral use of pilocarpine and are the main reason why patients discontinue therapy.¹⁰ The most common adverse effect is sweating.¹⁻⁶ Increased sweating may exacerbate dehydration in patients unable to drink sufficient fluids and hence pilocarpine should be used cautiously in patients with other risk factors for dehydration.^{6,10} Oral pilocarpine paradoxically causes hypertension^{2,3,4} and blood pressure monitoring should be considered where practical. Oral pilocarpine should also

be used with caution in patients with a history of peptic ulceration (increased acid secretion), urinary tract obstruction (increase ureteral smooth muscle tone) or Parkinson's disease (dose related central nervous system effects)^{3,4}.

References

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