
Overview Of Dry Eye Syndrome

Introduction

Dry Eye Syndrome (DES) is defined as a multifactorial disease characterised by a loss of homeostasis of the tear film [1]. Common symptoms include; ocular irritation, grittiness, stinging or burning sensations, itchiness, inflammation, eye fatigue or occasional blurred vision and may range from mild and occasional to severe and continuous [2].

Aqueous-deficient Dry Eye can be caused by Sjögren Syndrome, inflammation or obstruction of the lacrimal gland, or hyposecretory states of the lacrimal gland [1]. Evaporative Dry Eye can be caused by meibomian gland dysfunction, anterior blepharitis, rosacea, lid aperture disorders or vitamin A deficiency [1]. It can also arise as a side-effect of medications such as oral contraceptives, antihistamines and beta-blockers [4]. Dry eye affects 20% of the Australian adult population [5] where the elderly, women, diabetics, contact-lens wearers and those with LASIK and refractive eye surgery are more at risk [1].

Dry Eyes may co-occur with other linked diseases, however it is important to differentiate these conditions. Blepharitis can be distinguished if crusty particles are evident in the lashes and is accompanied by itchiness [6]. Sjorgen's syndrome can be distinguished when the symptoms of Dry Eyes are accompanied by a dry mouth [7]. Allergic and infective conjunctivitis can be recognised with redness, discharge and inflammation in the eyes due to factors such as bacteria, viruses, chemicals or allergies [8]. Ectropion can be identified when the lower eyelid faces outwards or if physical eyelid abnormalities can be observed [9].

Diagnosis and Treatment

As Dry Eye Syndrome is a symptomatic condition, it is commonly identified through asking a set of diagnostic questions to the patient. A pharmacist will firstly want to identify the aforementioned symptoms as described by the patient or observed. The pharmacist should also prompt the patient to identify any systemic diseases or related medical conditions that may cause or contribute towards DES. Pharmacists should seek to relate any current medications the patient is on, which may provide evidence for medicine-induced DES. The pharmacist may also ask if symptoms are exacerbated by dry air, wind, dust or smoke [9, 10].

Manipulating the physical environment around the eye is the most feasible treatment to help manage Dry Eye Syndrome. Some lifestyle changes include using a humidifier to minimise evaporation of the tear film or reducing low-blink rate behavior such as screen-watching. For patients spending significant time outdoors, wrap-around sunglasses are recommended to minimise exposure to dust, smoke and wind. Increasing omega-3 fatty acids in a patient's diet, such as fish oil, linseeds, tofu, and walnuts may help to maintain the lipid layer in the eye [11]. Ocular lubricants such as eye drops can be used to supplement natural tears and increase the volume of aqueous layer of the eye, and lubricating eye ointments can be used in more severe cases [12].

Treatment Options - Eyelid Hygiene Practices and Polyethylene Glycol Eye Drops

The symptoms of dry can be managed through non-pharmacological and pharmacological treatment methods, which both aim to restore homeostasis of the tear film by targeting different layers. The implementation of eyelid hygiene practices within patients' lifestyle habits can stimulate lacrimal secretion and prevent obstruction of tear glands that may cause hypersecretion. Patients can use a warm compress to improve blood flow to the eye area which may relieve eye inflammation whilst providing a high moisture external environment for added ocular hydration [13]. Patients should place a warm wet cloth directly on closed eyes and surrounding areas. Patients may also gently massage closed eyelids in circular motions or apply a sweeping gentle pressure from the distal to the proximal areas of the surrounding eye socket, helping to physically assist the excretion of oil from the meibomian glands into the eyes [14]. A final gentle sweep of a water-soaked cotton bud across the eye margins can also help to remove any crusty particles on the eyelids [14]. Contrastingly, pharmacological treatments, such as Polyethylene glycol (PEG) eye drops can topically administer active ingredients directly onto the ocular surface, providing rapid and effective relief. PEG mimics the osmolarity of natural tears, providing extra volume to the aqueous layer needed to alleviate symptoms [15]. Patients should invert the bottle twice to ensure the ingredients are actively mixed before administering the eye drops. Patients should use the index finger to slightly pull the lower eyelid to make a pouch, tilt their head back and instil the required dose into the affected eye(s). Patients should close their eyes to allow for even distribution and use their finger to gently apply pressure to the tear ducts to reduce excess drainage [16].

Both treatments can be applied immediately once symptoms are present and can be applied at similar time intervals. Eyelid hygiene practices are recommended to be performed twice daily for 2-3 days when symptoms are present and then can be reduced to once daily. Similarly, the recommended dosage of PEG is one to two drops into the affected eye(s) every 12 hours for ongoing treatment, or when required if symptoms are reduced [17]. It is vital that contamination of the eye is prevented by washing hands before and after both treatments. With eye drops, further care should be taken to ensure the tip of eye drop bottle remains sterile.

Although treatments are both extremely safe, there are a greater amount of side effects associated with eye drops. These side effects are rare but may include minor redness and discomfort, however often do not require medical attention [12]. PEG eye drops may cause blurred vision upon initial administration and may cease in as little as seconds. In extremely rare cases, irritation, corneal and conjunctival epithelium damage or scarring can also arise due to preservatives found in some formulations of eye drops [17]. Switching to preservative-free formulations is ideal in these situations [18, 19]. Non-pharmacological treatment is extremely safe with little to no side effects. The temperature of the water bowl used with the compress should be measured and not exceed 40°C to decrease risk of burns and irritation to the skin [20].

Pharmacists Role and Referral

A pharmacist can improve medication treatment outcomes by providing accurate diagnosis, identifying causal factors, and consequently recommending appropriate treatment and suitable lifestyle changes. Pharmacists can recommend different treatments based on the patient's

lifestyle factors to encourage adherence. Fast and convenient eyedrops can be more strongly recommended for patients with busy lifestyles and eyelid hygiene practices for those with more time. Pharmacists should elicit the patient's accurate understanding of include the mode of action, dosage and frequency and strategies to minimize side effects, to ensure proper adherence. Short demonstrations on the physical administration of eye drops or the hygiene practices and massaging techniques can also increase patient understanding. Information provided can be reinforced through medication leaflets or on Patients Information Leaflets on the condition, such as the one available from the Welsh Medicines Information Centre [15]. A pharmacist should facilitate continual reassessment of the patient's condition by asking them to immediately return if symptoms persist or worsen, or to return at a later date to monitor and encourage medication adherence (19).

Due to the sensitivity and delicacy of the eyes, a pharmacist may refer patients to a doctor as soon as any serious abnormality is present. Immediate referral is required if there is deterioration of visual acuity or if corneal inflammation, iritis or acute glaucoma is suspected [21]. These can be present in symptoms such as moderate to severe eye pain, photophobia or marked unilateral redness. If an undiagnosed underlying causative disease is suspected, such as Sjorgen's disease or eyelid deformities, then referral is also recommended. Patients with severe eye discharge and inflammation may have an eye infection and should be referred, especially if they have not had this condition before [22]. Furthermore, referral is required if appropriate treatment strategies has provided no relief of symptoms for four weeks or the condition has worsened from the use of eye drops 72 hours after use [18].