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EDITORIAL

Reducing the burden of ocular surface disease with serum eye drops

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We know that ocular surface disease (OSD), which often manifest as dry eye disease, can severely impact health and vision-related quality of life. Many such patients have a severe functional impairment and high symptom burden [1]. Despite recognising this suffering, treatments for OSD can be highly unsatisfactory [2]. The general approach is to use topical eye drops that help to improve ocular surface sustenance [2].

Normal tears are composed of a complex of agents that not only help to lubricate the surface but provide nourishment, optical clarity, comfort and prevent infection. There is a bewildering range of complex factors within human tears, such as growth factors, glycoproteins, and nutrients that help support ocular surface architecture's function and health. Pharmaceutical companies have advanced in their range of ocular surface treatments over the years, however, it is difficult to manufacture all these components in a single eye drop.

Serum eye drops have been long advocated as the 'holy grail' for severe ocular surface disorders. SED provides a variety of nutritional molecules such as vitamins, glucose, growth factors and immunoglobulins. These help to restore an environment that promotes reepithelialisation and supports ocular surface health [3]. As long ago as 1984, SED has been widely used to treat a variety of OSD with multiple underlying aetiologies, usually few side effects with positive clinical outcomes [4].

However, the preparation of SED has not been standardised [3, 4]. Protocols to prepare and use autologous serum eye drops vary considerably between studies [4]. One approach, first described in this journal, has even shown the effectiveness of using a patient's own finger-prick blood and applying it to the ocular surface [5]. The standardisation of preparation and protocols is essential as different approaches can affect the biochemical and physical properties and ultimately evaluate the effectiveness of SED [3].

For over a decade, NHS Blood and Transplant (NHSBT) have provided a highly standardised service for the provision of autologous and allogenic SED in the UK. These can be prescribed for patients who suffer from severe dryness of the eye who do not obtain relief from conventional eye drops. NHSBT has dedicated laboratory facilities and has quality management systems that allow screening of donors, collecting blood and manufacturing the serum, which is diluted with saline and dispensed into dropper bottles returned to the patient. NHSBT have the options of using Autologous and Allogenic SED. The latter is provided from screened healthy donors. Allogenic present potential advantages in those patients who were not medically suitable to donate their blood due to co-existing medical conditions such as anaemia or poor venous access. The availability of allogenic SED allows urgent SED for 'emergency' uses, e.g. ocular surface burns, chemical eye injury.

Lomas et al. report the most extensive case series evaluating the impact of the SED on patient-reported outcome measures using the Ocular Surface Disease Index (© (OSDI) (Allergan plc, Irvine, CA) validated questionnaire [6]. They show the equal performance of Allogenic SED and Autologous SED. Both Auto-SED and Allo-SED are well tolerated.

Overall, they show that Autologous SED's results in almost 58% improvement in OSDI and 47% in patients using Allogenic SED at 1 year. This is significant because they have studied 279 patients in their cohort, 71 patients with Autologous SED, and even more significantly, 208 patients were using allogenic SED [6].

Over the follow-up period, only 7% of patients who joined the SED program had treatment withdrawn. Only three patients withdrew due to their inability to tolerate SED, and two patients received no benefit from them. Adverse events or reactions were reported only in 2% of patients.

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However, following a detailed review, none of these was considered likely to be related to SED treatment [6].

Although there are limitations in this study, as many patients are likely to be on other concurrent treatments for their OSD, the study confirms findings from previously reported studies with much smaller cohorts of patients showing a similar magnitude of improvement [7, 8]. Most interesting is that this can be improved almost as well with allogenic SED [6].

For decades it has been advocated that using one's blood offers an exciting substitute for human tears. However, using someone else's may be just as effective!

Compliance with ethical standards

Conflict of interest The author declares no competing interests.

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