Journal of Paediatrics and Child Health

doi:10.1111/jpc.15395

INSTRUCTIVE CASE

Hand sanitiser-associated ocular chemical injury in children

María Teresa Rodríguez-Ares,[1] Rosario Touriño,[1] David Lamas-Francis,[1] Laura Martínez-Pérez,[1] Marina Bustelo[2] and Francisco González[1]

Departments of [1]Ophthalmology, and [2]Pediatrics, University Hospital of Santiago de Compostela, Santiago de Compostela, Spain

Hand hygiene using hand sanitisers which contain at least 60% alcohol has been advised[1] to prevent the transmission of Covid-19. To date, most hand sanitisers contain alcohol-based formulations with 62–95% alcohol, which denature proteins and have the ability to inactivate viruses.[2] Amid the Covid-19 pandemic, an increase of ocular chemical injuries associated with hand sanitisers has been reported.[3] Several children have presented at our ophthalmology emergency department because of ocular injuries caused by hand sanitisers. Most cases showed mild ocular alterations; however, in one case the injury was severe.

Case Report

A 3-year-old male was referred to our emergency department for left eye pain following accidental splashing with an alcohol-based hand sanitiser in his eye. Irrigation of the eye with saline was carried out at a primary care centre and repeated on admission to our hospital. The pain was very intense which made the examination of the eye difficult. However, an initial assessment revealed conjunctival redness with no clear limbal ischaemia, as well as an epithelial defect of about 90% of the cornea and of the almost all of limbal conjunctiva (sparing the superior quadrant). Patching (for comfort), erythromycin ointment, dexamethasone, cyclopentolate and preservative-free lubricants were administered, as well as oral analgesia and vitamin C. Six days later, the condition had only slightly improved, as a large corneal and conjunctival epithelial defect was still present (Fig. 1). An amniotic membrane patch graft (epithelial side down) was placed over the cornea and conjunctiva. Ten days later, the membrane detached itself and the conjunctival redness and corneal epithelial defect improved, but there was a small central corneal opacity which persisted 2 months later. The patient has 20/20 visual acuity in both eyes and is currently being followed up.

Key Points

1 Ocular burns due to alcohol-based hand sanitisers can be severe and lead to significant visual deficit.
2 Children are especially at risk as immediate irrigation can be challenging.
3 Caution should be taken when managing these products, especially in the paediatric population.

Correspondence: Dr David Lamas-Francis, Department of Ophthalmology, University Hospital of Santiago de Compostela, Ramón Baltar s/n, 15706 Santiago de Compostela, Spain. Fax: +34 981 950 900; email: david.lamas@outlook.es

Conflict of interest: None declared.

Accepted for publication 29 January 2021.

Discussion

Alcohol-based hand sanitisers represent an emerging source of chemical injury in the context of the current Covid-19 pandemic. Ocular lesions following exposure to other toxic agents have been widely reported and generally resolve within days without significant consequences. However, prognosis varies depending on the severity of the injury, the type of agent and its concentration, as well as the contact time. Immediate copious irrigation is key to reduce the incidence of adverse outcomes such as limbal stem cell deficiency or corneal scarring.

An analysis of 144 149 chemical ocular burns diagnosed at the US emergency departments between 2010 and 2013 found that children aged 1–2 years are at a significantly higher risk for ocular chemical burns than any other group.[4] In this age group, alkaline burns were more frequent, which are known to cause more severe ocular lesions than acidic substances. A case series of 12 ocular burns in children younger than 5 years highlights liquid detergent pods as the most common agent.[5]

In the case we report here, the ocular damage was so intense that an amniotic membrane graft was applied, resulting in a clearly improved condition after 1 week. Although the epithelial defect would probably heal without surgery, it is well known that amniotic membranes promote epithelialisation and reduce inflammation, neovascularisation and scarring.[6] Good results have been reported in other cases of severe corneal burns treated with amniotic membrane transplantation.[7]

The reason why in this case the condition was so severe was probably related to the amount of gel that entered the eye or to poor and delayed irrigation of the eye. However, we cannot confirm this point because the mother of the patient could not specify the time between the exposure and the first irrigation. Initial ocular irrigation can be challenging in young children but is essential. The use of toxic products such as hand sanitisers in schools should be supervised, and emphasis should be made on specific labelling and product designs which can minimise the event of accidental exposure.

Adults should be aware that inadequate handling of hand sanitiser dispensers may produce ocular chemical injuries in children and more cases similar to the one reported here should be expected during the Covid-19 pandemic. Proper immediate

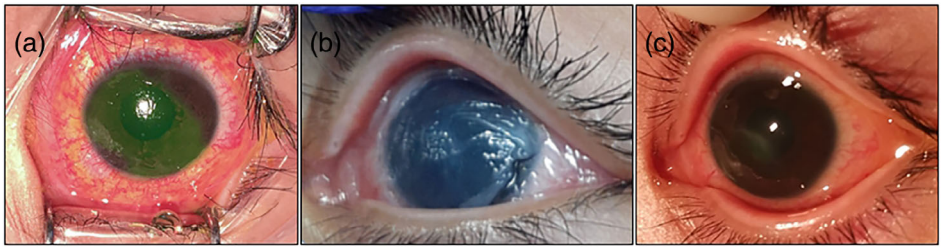

Fig. 1 Photograph of the patient's left eye, showing the large epithelial defect 6 days after presentation (a), 1 day after surgery (b) and 10 days after the procedure (c).

treatment and handling may avoid irreversible eye damage and preserve the patient's visual outcome.

Written informed consent was obtained from the patient's guardian.

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