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A CASE OF CORNEAL LESION AFTER USE OF ANTI-FOG FOR SWIMMING GOGGLES

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OBJECTIVE

We present a case of corneal lesions after inappropriate use of an anti-fog on swimming goggles.

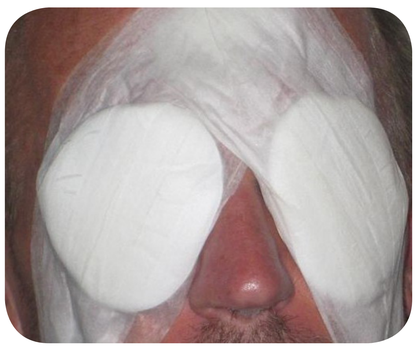
< 5% anionic and non-ionic surfactants (1-3% docusate sodium and < 1 % non ionic surfactant ethoxylate), 0.1-0.2 % formaldehyde (sol 24%) and 4-6% propan-2-OL, all classified as eye irritants.

CASE REPORT

A 51-year-old man experienced bilateral corneal lesions after accidental prolonged (+/- 1 hour) exposure to a diluted anti-fog product. The day before taking part to an Ironman (long distance triathlon with 3.8 km swim), he sprayed his swimming goggles with an anti-fog. Instead of rinsing the goggles after the product had been sprayed, as stated in the instructions for use, he let it dry out.

The day after, during the swimming part of the race, water entered into the goggles. No pain but an urge to keep the eyes closed was felt while swimming. Once out of the water, a severe and painful burning sensation quickly developed on both eyes and it was progressively almost impossible to keep the eyes open. The athlete was referred to the hospital. The ophthalmologist diagnosed a deep corneal abrasion on 50% of the surface of the left eye and middle corneal abrasion on 70% of the right eye. After symptomatic treatment, the patient fully recovered within 9 days.

DISCUSSION



According to the Safety Data Sheet, the product has a neutral pH and contains two surfactants, up to 6% isopropanol and up to 0,48% formaldehyde.
As the product was allowed to dry during 15 hours, we assume that isopropanol and formaldehyde evaporated and that the ocular lesions are due to the surfactants that solubilized in water and came in contact with the eye.

For the surfactants present in the formulation there is no classification available in the Dangerous Substance Directive 67/548/EEC. The manufacturer self- classified the surfactants as irritants.

There is currently no harmonized CLP classification at Community level for Docusate sodium according to the GHS. No search could be made on the non –ionic surfactant as no CAS number was provided.

In the ECHA public databases on registered chemical substances [1], there is toxicological information available on Docusate sodium. Skin irritation studies result in a category 2 skin irritant classification. An eye irritation study, flagged as a key study, results in a classification in category 1 eye damage (irreversible effect on the eye). The new CLP regulation EC/1272/2008 entered into force in January 2009 and introduced changes to classification and labelling requirements for substances and mixtures. A transition period is applicable for mixtures until 06/2015. What will be the labelling requirements according to the new CLP regulations from June 2015 regarding the effects on eye and skin?

Stating there is no experimental data available for the mixture (or for a similar mixture), the concentration of the ingredients triggers the classification. In this case (additivity approach) the concentration triggering classification of the mixture as Eye Dam.1 is 3%.
The mixture will carry a pictogram of danger Corrosive and the Hazard statement H318. This evolution in the label requirements will occur for many surfactant based preparations. This will in a certain way better inform the final user regarding the hazard related to eye exposure.

However, the much wider use of the corrosive pictogram for mixtures that do not cause skin or esophageal burns raises the concern of blurring the message of the actual meaning of the corrosive pictogram.

CONCLUSION

The absence of danger symbol on a product label does not exclude disabling eye damage.
The instructions for use should warn the user against the risk for eye damage if the product is not rinsed after application. Labelling according to the new CLP regulation will be more informative but raises the problem of correct interpretation of the corrosive pictogram by consumers.

REFERENCES

http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances

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