Allergic Contact Dermatitis to IBOA in the glucose sensor FreeStyle Libre® in a Tertiary Care Portuguese Hospital

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Background

In the past few years, the glucose sensor FreeStyle Libre® has been associated with several cases of allergic contact dermatitis.

The allergen responsible for most of these cases is isobornyl acrylate (IBOA; CAS 5888-33-5), a substance present within the sensor that migrates through the adhesive, thereby reaching the skin.

Objectives

The goal of this study was to describe and characterize a population with contact dermatitis caused by glucose sensors in a Tertiary Care Portuguese Hospital, and to assess the prevalence of IBOA sensitization.

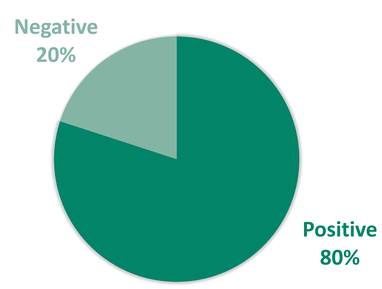
Methods

Overall, 10 patients with cutaneous reaction to the glucose sensor FreeStyle Libre® were patch tested with the Portuguese baseline series, acrylates, plastic & glues series (provided from Chemotechnique), and with IBOA, purchased from Sigma-Aldrich and diluted 0.1% in pet. Twenty healthy controls were tested with IBOA.

Results

Seven females and three males were patch tested, with a mean age of 42 years. Nine patients had Diabetes type 1, with only one patient suffering from Diabetes type 2. Mean time between the beggining of the use of the sensor and the onset of allergy symptoms was 7 months.

Redness and itching were the most common symptoms, reported by all the patients. Positive patch test reactions to IBOA were observed in 8 patients, as ilustrated in graphic 1.



Graphic 1: IBOA sensitization

Among patients who tested positive for IBOA, most of them showed a strong positive reaction after 72h (++), with one developing an extremely positive reaction (+++), as depicted in figure 1. All the 20 controls tested negative for IBOA.

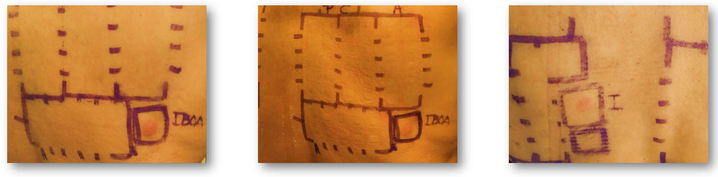


Figure 1: Extremely strong (A) and strong (B and C) reactions to IBOA.

Acrylates, plastic & glues series were negative in all patients. Three patients who tested positive to IBOA also reacted to some allergens of the Portuguese baseline series, all of them with past relevance, as depicted in table 1.

Allergen	No
Fragrance mix I	2
Hydroperoxides of Linalool	2
Peru balsam	1
Sesquiterpene lactone mix	1
Kathon CG	1
Octylisothiazolinone	1

Table 1: Other positivities observed.

Two patients turned out to be negative in all patch tests.

The dermatitis resulted in the cessation of the use of the sensor in 5 patients, while the other 5 continued to use it. Patients who stopped using the sensor reported a significant worsening of their quality of life.

Conclusions

Allergic contact dermatitis caused by glucose sensors is an increasingly recognized problem, IBOA being the most common culprit allergen. In our series, we found a sensitization prevalence of 80% to this allergen, which is concordant with previous studies. Two of our patients did not react to IBOA, which can be explained by an irritant contact dermatitis instead of allergic contact dermatitis or to sensitization to a different allergen, such as N-N dimethylacrylamide, which we were not able to test.

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