

Indocyanine green and fluorescein filters reveal dye staining before clinical development of hives

Carlo La Spina^{1,2}, Paolo Broganelli³, Roberta La Selva³, Christian Luigi Demasi², Giuseppe Querques¹

¹ Department of Ophthalmology, IRCCS San Raffaele Scientific Institute, University Vita-Salute San Raffaele, Milan - Italy

² Department of Ophthalmology, Unit A of General and Pediatric Ophthalmology, ASL TO1, Ospedale Oftalmico, Turin - Italy

³ Department of Dermatology, AO Città della Salute e della Scienza di Torino, Turin - Italy

ABSTRACT

Purpose: During retinal angiography a fluorescein-induced allergic reaction is rare but possible.

Methods: We report a single retrospective clinical case.

Results: During retinal angiography on a 75-year-old man, an unexpected allergic reaction to fluorescein (FL) dye occurred. At the beginning of the exam, we erroneously took some filtered shots of the patient's face. We noticed that the pictures of the patient's skin using the FL and indocyanine green filters revealed dye accumulation before the clinical appearance of hives.

Conclusions: Taking filtered shots of a patient's face could be an original method to promptly detect and easily document allergic hives, by simply using an angiographic device.

Keywords: Acute allergy, Fluorescein angiography, Hives

Introduction

In retinal angiography, two dyes are injected and a series of picture of the retina are taken using two different filters to isolate the fluorescence of fluorescein (FL) and indocyanine green (ICG) (1). An allergic reaction to FL is a rare adverse event (2).

Patient presentation

During retinal angiography on a 75-year-old man, an unexpected allergic reaction to FL dye occurred. At the beginning of the exam, we erroneously took some filtered shots of the patient's face. Interestingly, we noticed that pictures of the patient's skin using both the FL and ICG filters revealed dye accumulation before the clinical appearance of hives (Fig. 1). In the left image, the areas where the hives subsequently developed clearly appeared with the ICG filter. In the right image, the same shot with the FL filter revealed the corresponding areas as slightly whitish spots. After 3-4

minutes, the patient developed typical cutaneous hives and was diagnosed with an allergic reaction. With the appropriate treatment, a prompt resolution of the complication was obtained.

Conclusions

Hive lesions begin when cutaneous mast cells and basophils release histamine and other inflammatory mediators at the skin surface. The mast cells are stimulated to release these chemicals when immunoglobulin E antibodies bind to an allergen and effectively flag it up as a foreign body. Histamine triggers the dilation of the blood vessels across the skin, leading to its warm and reddish appearance (3). It is likely that the augmented blood levels in the hive areas generate a staining of both the ICG and FL dyes (4). Considering the relative transparency of keratin-rich epidermis layers, dye-staining spots were detected in our filtered images even before the clinical development of hives.

To the best of our knowledge, this is the first report describing the possibility of documenting the staining of dye responsible for the allergic reaction before the development of hives, by means of a standard angiographic device (Spectralis + Heidelberg Retina Angiograph, Heidelberg Engineering). We suggest that the simple procedure of taking face shots with dye filters during retinal angiography may help to detect an allergic reaction at the early stage of its development, thus allowing prompt treatment. Comparing some shots taken before and after the injection of dye could help to prevent the misdiagnosis of hives, when, in fact, there are some preexisting areas of skin vasodilation.

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Corresponding author:

Carlo La Spina
Department of Ophthalmology
IRCCS San Raffaele Scientific Institute
University Vita Salute San Raffaele
Via Olgettina 60
20132 Milan, Italy
carlo.laspina@gmail.com





Fig. 1 - Face shots of a patient taken during an allergic skin reaction. In the left image, areas where clinically detectable hives subsequently developed appeared clearly with indocyanine green angiography filter (arrows). In the right image, the same shot with a fluorescein angiography filter revealed the corresponding areas as slightly whitish spots (arrows).

Disclosures

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References

1. Ilginis T, Clarke J, Patel PJ. Ophthalmic imaging. *Br Med Bull.* 2014;111(1):77-88.
2. Lira RP, Oliveira CL, Marques MV, Silva AR, Pessoa CC. Adverse reactions of fluorescein angiography: a prospective study. *Arq Bras Oftalmol.* 2007;70(4):615-618.
3. Marzano AV, Borghi A, Cugno M. Adverse drug reactions and organ damage: The skin. *Eur J Intern Med.* 2016;28:17-24.
4. Wawrzyniak P, Akdis CA, Finkelman FD, Rothenberg ME. Advances and highlights in mechanisms of allergic disease in 2015. *J Allergy Clin Immunol.* 2016;137(6):1681-1696.