

Allergic reaction to fluorescein dye: successful one-day desensitization

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ABSTRACT • RÉSUMÉ

Case report: An 86-year-old woman developed IgE-mediated generalized urticaria after a second fluorescein injection. A one-day desensitization protocol was successfully administered that permitted continuation of angiography for deteriorating vision.

Comments: We review the literature on adverse events associated with administration of fluorescein and suggest guidelines for testing and desensitization.

Observation : Une femme de 86 ans a développé une urticaire généralisée médiée par les IgE après une seconde injection de fluorescéine. On a appliqué avec succès un procédé de désensibilisation d'une journée, ce qui a permis de poursuivre l'angiographie pour mesurer la détérioration de la vue.

Commentaires : Nous avons fait une revue de la littérature sur les événements adhés associés avec l'administration de la fluorescéine et suggérons des lignes directrices pour le test et la désensibilisation.

Fluorescein angiography is associated with a low incidence of adverse effects, most notably nausea and vomiting. We describe a patient who experienced urticaria after fluorescein injection, and we review management strategies.

CASE REPORT

An 86-year-old woman developed generalized urticaria within a few minutes of her second fluorescein injection for investigation of macular degeneration. The patient had a history of adverse reactions to codeine, tetracycline, and sulfonamide antibiotics. After diphenhydramine administration, her urticaria subsided within 4 hours.

The patient underwent fluorescein prick (2 mg/mL) and intradermal (200 mg/mL) skin testing. She was positive at the intradermal site. Skin testing in 3 control patients was negative. Recommendation to the patient

after the testing was avoidance of the fluorescein dye.

Because of her deteriorating vision, the patient's ophthalmologist requested reevaluation of the recommendation to avoid fluorescein. With informed consent, the patient successfully underwent an intravenous desensitization to fluorescein dye in an outpatient clinic over a 3-hour period (Table 1). The fluorescein angiogram was done 1 hour after completing the desensitization, and the patient developed minor tingling, without any objective findings or changes in her vital signs. Diphenhydramine was administered and the itching resolved. The patient completed her procedure without sequelae.

COMMENTS

The most frequent adverse effects associated with intravenous fluorescein are nausea and vomiting, which

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Table 1—Fluorescein desensitization

Dose*	Dilution	Dose, mL
1	1/100	0.1
2	1/100	0.2
3	1/100	0.3
4	1/100	0.4
5	1/10	0.1
6	1/10	0.2
7	1/10	0.3
8	1/10	0.4
9	Full strength	0.1
10	Full strength	0.2
11	Full strength	0.3
12	Full strength	0.4

*Doses administered every 15 minutes.

Note: Fluorescein angiography with 1 mL of 20% solution was administered 1 hour after desensitization.

Table 2—Reports of allergic reaction after administration of intravenous fluorescein

Patient, age (y), sex	Onset	Symptoms	Investigations
67 F ¹	"Immediately"	Dizziness, diaphoresis, nausea, sphincter relaxation, hypotension, malaise	Skin test positive
30 M ³	Not stated	Yellow urticarial lesions	None
66 M ³	Not stated	Edema of face and hands	Skin test positive; successful IV desensitization
23 F ⁴	Not stated (minutes?)	Hypotension, respiratory distress, hand edema, angioedema	Skin test positive
75 M ⁴	"Immediately"	Respiratory distress, loss of consciousness	Skin test positive
75 M ⁵	2 hours	Nausea, chills, back discomfort, malaise, rash, fever, elevated white blood cell count	None
35 M ⁶	Several days	Pruritic eruption (psoriasisiform)	Patch testing negative; IV challenge positive (3 days after injection)
69 F ⁷	"Immediately"	Paresthesia of lips, respiratory difficulty, pulmonary edema, death	Not applicable
43 M ⁸	5 minutes	Generalized urticaria	None
23 F ⁹	Minutes	Left eye discomfort, periorbital erythema, urticaria	None

Note: F = female, M, male; IV, intravenous.

occur in 2%–10% of patients. Moderately severe adverse reactions, such as skin eruptions (e.g., urticaria), occur in 1.5% of patients; the onset is usually within 15 minutes of administration. Severe adverse reactions (0.05%), such as cardiovascular, respiratory, and neurologic complications, may have prolonged effects and require intensive treatment.¹ A life-threatening anaphylactic reaction is very rare and has been estimated to occur in approximately 1 in 222 000 administrations.² There are 10 case reports in the literature documenting allergic reactions to fluorescein (Table 2). Our patient developed generalized urticaria approximately 10 minutes after receiving her second fluorescein injection.

Prick and intradermal skin testing has been used as a diagnostic tool in the evaluation of IgE-mediated reactions, consisting of symptoms of angioedema, urticaria, hypotension, and (or) anaphylaxis. Skin testing has been used to evaluate patients with histories consistent with an IgE-mediated reaction to fluorescein.^{1,3,4}

Desensitization, which results in a temporary state of immune tolerance to the drug, has been successfully employed for drugs such as aspirin and penicillin. Because of the risks associated with desensitization, this procedure is only recommended if use of that medication is essential and no substitute can be found. In order to maintain drug tolerance, the medication must be administered on a regular and continuous basis. Therefore, if the medication is only used for short-term therapy, as with fluorescein, the desensitization process must be repeated for any future courses. Nucera et al describe a patient who was successfully desensitized to fluorescein given every 30 minutes over a 2-day period.³ On the third day, the patient underwent fluorescein angiography without any adverse reaction. Our patient

underwent a similar procedure, although both the desensitization and the angiography were carried out on the same day.

Confirmation of an IgE-mediated reaction to fluorescein can be accomplished through the use of skin testing. In those patients who are positive on skin testing but who may require further administration of fluorescein dye, desensitization with appropriate monitoring can be attempted.

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