

Anaphylaxis following intravenous fluorescein angiography in a vitreoretinal clinic: report of 4 cases

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ABSTRACT • RÉSUMÉ

Objective: To assess the incidence of anaphylaxis following intravenous fluorescein angiography (IVFA) at 1 satellite clinic.

Study Design: Observational case series.

Participants: Records from 1400 patients were reviewed.

Methods: Consecutive vitreoretinal patients who underwent IVFA between 1998 and 2005 at 1 satellite office were included for retrospective analysis.

Results: Anaphylaxis developed in 4 of 1400 (0.3%) patients within minutes after they had received intravenous fluorescein. In each case, the reaction was recognized promptly and treated with injectable epinephrine by the physician, and symptoms resolved quickly. The ambulance was called in all 4 cases. In the literature, reports of 21 cases of anaphylaxis and 7 deaths have been published in the past 55 years.

Conclusions: Although uncommon, anaphylaxis as a reaction to intravenous fluorescein does occur. As this is potentially life-threatening, prompt diagnosis and treatment are crucial. An emergency care plan should be available.

Objet : Évaluation de l'incidence de l'anaphylaxie à la suite d'une angiographie à la fluorescéine par injection intraveineuse (AFIV) dans une clinique satellite.

Nature : Observation d'une série de cas.

Participants : Dossiers de 1400 patients.

Méthodes : Analyse rétrospective des dossiers des patients consécutifs qui, ayant une maladie vitréorétinienne, ont subi une AFIV entre 1998 et 2005 dans une clinique satellite.

Résultats : L'anaphylaxie s'est développée chez 4 patients sur 1400 (0,3 %) dans les minutes qui ont suivi l'injection intraveineuse de la fluorescéine. Dans chaque cas, le médecin a décelé rapidement la réaction qu'il a traitée par une injection d'épinéphrine. Les symptômes se sont vite résorbés. L'on a appelé l'ambulance pour chaque cas. La littérature signale 21 cas d'anaphylaxie et 7 décès au cours des 55 dernières années.

Conclusions : Bien qu'elle soit rare, l'anaphylaxie survient effectivement en réaction à une injection intraveineuse de fluorescéine. Comme cette réaction peut être mortelle, il est crucial de la diagnostiquer et de la traiter rapidement.

Intravenous fluorescein angiography (IVFA) is used extensively for the management of vitreoretinal diseases.¹ However, IVFA is not without complications.²⁻⁴ We report the incidence of life-threatening anaphylactic reactions to IVFA at 1 satellite vitreoretinal clinic of Duke University Eye Center. All patients undergoing IVFA received 3 mL of fluorescein sodium 10%, 100 mg/mL for IV injection (Altaire Pharmaceuticals, Aquebogue, N.Y.).

METHODS

Records of patients undergoing IVFA at 1 clinic between 1998 and 2005 were reviewed. A waiver was obtained from our Institutional Review Board for use of existing data. Of 1400 patients, 4 had an anaphylactic reaction to fluorescein, requiring prompt medical attention and administration of systemic epinephrine (EpiPen, Dey, LP, Napa, Calif.).

Case 1

An 84-year-old female underwent IVFA for evaluation of neovascular age-related macular degeneration (AMD). She had no history of medication allergies. As angiography neared completion, the patient developed difficulty speaking. She indicated that her throat was dry and "scratchy." She then showed laboured breathing. No hives were present. The diagnosis of anaphylaxis from IVFA was made, and epinephrine was promptly administered through her clothing in the upper outer thigh. A 911 call was made. Within 1–2 minutes, her breathing and speech improved. The ambulance arrived after 15 minutes. She was transported to the emergency department, where she received methylprednisolone intravenously and benadryl intramuscularly (IM), and discharged home.

Case 2

A 76-year-old obese female underwent IVFA for neovascular AMD. Her medical history was significant for

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an anaphylactic reaction to a bee sting 35 years earlier requiring epinephrine. Partway through angiography, the patient reported feeling flushed and itchy. The procedure was stopped. Hives were noted on her lips and neck, and 50 mg of benadryl was injected IM. The hives continued to progress, and a dry cough developed. The diagnosis of anaphylaxis was made, and epinephrine was promptly administered. A 911 call was made. Within 1–2 minutes, the dry cough resolved and the hives ceased progression. About 10 minutes elapsed before the ambulance arrived. The patient was transported to the emergency department, where she received an IV bolus of methylprednisolone, was observed, and discharged.

Case 3

A 68-year-old female underwent IVFA for neovascular AMD. She had no history of medication allergies. During angiography, the patient coughed a few times. After the procedure had been completed, the dry cough increased in frequency and intensity, and rhinorrhea developed. There were no hives. The diagnosis of anaphylaxis was made, epinephrine was administered, and a 911 call was made. Within 5 minutes, the cough and rhinorrhea resolved. Twenty minutes elapsed before the ambulance arrived, and the first responders to this 911 call were basic emergency medical technicians who were not allowed to carry or administer epinephrine but could help the patient “administer their own epinephrine.” Eventually, paramedics arrived and the patient was transported to the emergency department.

Case 4

A 74-year-old female underwent IVFA for the evaluation of neovascular AMD. She had no history of medication allergies. As angiography neared completion, the patient reported feeling “funny” and nauseated, and angiography was stopped. The patient noted a “drainage” in the back of her throat and a dry cough. A few hives developed on her neck and upper chest. The diagnosis of anaphylaxis was made, epinephrine was promptly administered, and a 911 call was made. Soon after the epinephrine injection, the patient reported feeling better, and the cough subsided. About 10 minutes elapsed before the ambulance arrived and she was transported to the emergency department.

DISCUSSION

Anaphylaxis is a sudden, severe, potentially fatal allergic reaction that can involve various organs (such as skin, respiratory tract, gastrointestinal tract, and cardiovascular system). Symptoms may include hives, a sensation of warmth, wheezing/coughing, swelling in the mouth and throat, difficulty breathing, vomiting, diarrhea, cramping, a drop in blood pressure, and loss of consciousness. Not all symptoms may be present. Anaphylactic reactions can be mild to life-threatening and are unpredictable.⁵

During the study timeframe, there were 4 patients of 1400 who experienced an anaphylactic reaction, and all 4 required administration of epinephrine. This was the first exposure to IVFA for these 4 patients. No other patients received only benadryl IM. In the literature, reports of 21 cases of anaphylaxis and 7 deaths have been published in the past 55 years. The frequency of death from IVFA has been estimated to be 1 in 222 000.² Fortunately, none of these 4 individuals died, owing to prompt diagnosis and management.

Prompt administration of epinephrine is the treatment of choice for anaphylaxis.⁶ Relying on 911 to diagnose and treat anaphylaxis is not wise. In many U.S. states, certain types of emergency medical technicians are not authorized to carry epinephrine, as occurred with patient 3.

The American Academy of Ophthalmology Preferred Practice Patterns states that each angiographic facility should have in place an emergency protocol to minimize risk and manage complication.⁷ As part of our protocol, if symptoms are limited to itching, hives, or scratchy throat, benadryl is administered IM or orally, and vital signs are monitored until stable. If there are 2 systems involved (skin and respiratory, for example), epinephrine (EpiPen) is administered and 911 is called.

Regular stocking and updating of medications is needed, as well as regular training of photographers to recognize signs and symptoms of anaphylaxis in order to notify the physician. The authors recommend access to an emergency kit, which should include an airway, bag, IV equipment, automated external defibrillator, diphenhydramine (benadryl) for intramuscular and oral administration, and autoinjectors of epinephrine (EpiPen is 1 brand). The treatment protocol should be posted.

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