Iodine Allergies:

Updating Longstanding Myths

Diagnostic Green

DOES YOUR PATIENT REALLY HAVE AN IODINE ALLERGY?

The package insert for IC-Green® (indocyanine green for injection) contains the following contraindication, *IC-Green® (indocyanine green for injection) contains sodium iodide and should be used with caution in patients who have a history of allergy to iodides because of the risk of anaphylaxis.*

But can a patient really have an allergy to iodine, should your patient be denied the potential benefits of fluorescence guided surgery because of this contraindication?

Here are the newest facts relating to Iodine and allergies

Recent clinical publications demonstrate that iodine allergy is rare and largely misunderstood. Patients may be denied important clinical benefits of multiple procedures/tests as a result of this misconception.

CLEARING UP SOME MISCONCEPTIONS

A Patient cannot have an "iodine allergy"

- Iodine is an essential trace element, and iodine deficiency results in serious health consequences.
- Iodine, is an essential nutrient, and cannot be an allergen. People who react to medications or foods containing iodine are reacting to other allergens, not iodine.
- Iodine is not and cannot be an allergen. Iodine is found throughout our bodies in thyroid hormones and amino acids.
- By accepting the misconception that someone has an "iodine allergy", the patient is being denied the ability to have procedures including radiologic and **fluorescence guided procedures** that could be lifesaving or essential to improving their health.

ACTION ITEMS

Shellfish allergy = iodine allergy, right?

- The evidence suggests that asking if patients are allergic to shellfish or iodine has no relevance to radiocontrast allergies. This questioning perpetuates the myth of an association between shellfish, iodine, and contrast agents. Instead, ask if they have any allergies, have had a previous reaction to a contrast agent, or have evidence of atopy, such as asthma. Educate nurses and technicians to stop propagating this myth as well.

An opportunity to educate

- If your patient offers an allergy to iodine or shellfish, ask the patient if they actually have had a reaction to intravenous contrast in the past. Educate them that they do not have an "allergy" to iodine, and that an allergy to shellfish does not change the risk of reaction to intravenous contrast any more than any other allergy. Your patient may be denying themselves important and helpful medical therapies.

For full prescribing information, please go to Patient Information Leaflet at

www.diagnosticgreen.com

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Some further Scientific Information on Indocyanine Green and Iodine/Sodium.

IS THERE AN 'ALLERGY TO IODINE' ISSUE WITH INDOCYANINE GREEN?

Indocyanine Green (ICG, tradenames such as IC-Green® (indocyanine green for injection), Indocyanine Green for injection USP and Verdye) has a well-documented high safety and tolerability profile[1]. Combined with its unique pharmacokinetic and photo physical properties ICG enjoys wide acceptance and is used routinely in fluorescence guided procedures around the world.

The ICG molecule does not contain the ion iodide. However, the lyophilized powder for reasons of production process contains the salt **sodium iodide**, which allows for easier reconstitution of the dye. Sodium iodide is taken up by every human being during the course of normal nutrition and is required for the normal function of the thyroid gland. Sodium iodide is found in iodized nutrients e.g. in fish.

The connection between an iodine/iodide allergy and ICG has been previously raised, **however such a reaction is not considered plausible as the human body needs to absorb iodide for normal function and so allergic reactions based on sodium iodide, as contained in IC-Green® (indocyanine green for injection) or Verdye, is not possible[2].**

However, some old reference books and overviews still contain the term of iodine/iodide allergy in combination with ICG. This statement is not correct, nor scientifically supported.

- As the human body needs to take up iodide, **allergic reactions** based on sodium iodide, as contained in IC-Green® (indocyanine green for injection) or Verdye, **are impossible**, otherwise human life would be impossible.

HOW ALLERGIES OCCUR

Allergies are reactions by the body to antigens. Antigens must fulfil certain criteria to induce antibody production and subsequent allergy.

- One of these criteria is molecular size. Sodium iodide is a molecule of very small size which cannot be identified by the human organism as an antigen.
- Patients having so called "allergy to iodine" react on macro molecules containing iodine/iodide, such as contrast media for x-ray, iodine-containing disinfectants and iodine-containing drugs like Amiodarone. Unlike ICG, in those substances, iodide is bound within large molecules.
- A patient with known allergy against macromolecular iodide/iodine containing compounds has no problem when the salt sodium iodide is incorporated, as described above.

A diagnostic application of Indocyanine Green means a total dose of up to 840µg of iodide can be administered. This may pose a risk for **patients suffering from hyperthyroidism**. In these patients IC-Green® (indocyanine green for injection) or Verdye should only be used with caution or not administered at all.

Data on this page is expert opinion of:

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REFERENCES

[1] *Alander JT, Kaartinen I, Laakso A, Pätilä T, Spillmann T, Tuchin VV, Venermo M, Välisuo P (2012) A review of indocyanine green fluorescent imaging in surgery. Int J Biomed Imaging 2012:940585*

[2] *Wulf NR, Schmitz J, Choi A (2021) Iodine allergy: Common misperceptions Am J Health Syst Pharm 2021 Feb 6; doi: 10.1093/ajhp/zxab033*