

Seafood allergy is a specific and unique contraindication to the administration of ionic contrast media

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Historically, the development of iodinated ionic contrast media (ICM) has revolutionized the diagnostic capabilities of physicians, especially in the fields of urology and cardiology.¹ Acute reactions to the intravenous injection of ICM are potentially life threatening and well documented. Currently, each year in the United States, more than 10 million diagnostic procedures using ICM are performed, provoking anaphylactoid reactions in 1% to 2% of patients, severe reactions in approximately 0.1% and fatal reactions in 0.01% to 0.0025%, accounting for an estimated 500 deaths.² In an effort to prevent these reactions, physicians and support staff are often taught to solicit a specific history of seafood allergy before interventional procedures, and patient questionnaires and consent forms for computerized tomography (CT) and excretory urography routinely inquire about it.³ This question assumes that seafood allergy is a specific and unique allergy that predicts reaction to ICM over and above a routine allergy history. Indeed, this is a myth that may prevent clinicians from obtaining a more appropriate and predictive history for possible ICM reactions.

Witten and colleagues, in 1973, conducted a prospective trial involving 32 964 consecutive outpatients at the Mayo Clinic who were referred to the Department of Diagnostic Radiology for excretory urography during a 27-month period.⁴ The response of patients to injection of contrast material was tabulated in 1 of 3 categories: 1) no clinically significant response, 2) minor side effects, or 3) "acute" reactions. Acute reactions were recorded in 568 (1.72%) patients, and included urticaria, mucous membrane and cuta-

neous edema, bronchospasm, convulsions, hypotension, shock, cardiac arrest and death. Severe reactions occurred in 30 patients and notably, only 1 fatality was recorded in the entire group.

Approximately 10 000 of these patients were studied to determine the relationship between a history of allergy or hypersensitivity and ICM reactions. Acute reactions were associated with a history of previous reaction to injection of urographic contrast material (20%), inorganic iodides (13%), hives of unknown cause (7%), seafood allergy, asthma and miscellaneous food allergies (6% each), hayfever (4%) and miscellaneous allergies to other drugs and substances (2%).⁴

The overall incidence of reactions in patients with a history of allergy compared to those who reported no such history was 3% versus 1.2%. However, the severity of reactions was observed to be essentially the same for both groups. The authors concluded that neither a history of specific allergy nor a history of prior mild-to-moderate reaction from injections of contrast material is a contraindication to excretory urography.⁴

A 1975 study by Shehadi and coworkers⁵ involving 112 000 patients in several countries documents similar results. The overall incidence of adverse reactions in patients with a history of allergy was nearly twice that of the general population (10.2% vs. 5.65%). Risk factors were allergies to seafood and shellfish (14.98%), eggs, milk and chocolate (14.63%), asthma (11.18%), hayfever (10.33%) and penicillin (7.48%). The authors make no mention whether any of the observed differences were statistically significant.

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In 1980, a prospective survey was performed in 272 United Kingdom hospitals, and data were presented on the incidence of adverse reactions following intravenous urography, contrast CT scanning and intravenous cholangiography. During each of 2 randomized sample weeks, individual hospitals completed detailed forms for each intravenous urogram, contrast CT scan and intravenous cholangiogram. During the remainder of the 12-month survey period, hospitals were asked to complete forms only for intermediate, severe or fatal reactions. A total of 7616 forms were collected and analyzed.⁶

With respect to intravenous urograms, there was an 11-fold higher risk of a severe reaction (approximately 1 in 550) in patients with a previous reaction to contrast medium and a 5-fold increased risk of a severe reaction in patients with a history of asthma (incidence approximately 1 in 860). There was also an increased risk of moderate reactions in these groups, but no appreciable effect on minor reactions. The risk ratios for patients with hayfever, hives and other allergies were less marked, but still significant. It was also observed that patients with a history of cardiac disease were at increased risk for severe reactions. The authors concluded there is an increased risk of adverse events to iodinated contrast material in patients with a history of allergy or cardiovascular disease,⁶ but made no explicit mention of seafood allergy.

More recent literature discounts the importance of inquiring about seafood allergies. According to Hildreth,⁷ “the patient’s own history of allergy is of no value in predicting reactions to ICM. In particular, a history of allergy to foods that contain iodine is of no predictive value.” Goss and colleagues,⁸ writing in the cardiac angiography literature, noted that a history of allergy to foods containing iodine, such as seafood, is “of no predictive value.”

Lang and collaborators⁹ retrospectively evaluated adverse reactions after 28 978 ICM procedures. While these authors state in their introduction “that no reliable methods or historical features (for example, “seafood allergy”) currently exist that permit *a priori* identification of patients who will experience anaphylactoid reactions,” it is unclear whether this history was actually used as an exclusion criterion for

receiving ICM. In this group, 49 patients experienced moderate-to-severe anaphylactoid reactions and their medical records were compared with those from an appropriately matched control group.⁹ These authors concluded that beta-blocker exposure and asthma are statistically significant risk factors for anaphylactoid reactions from ICM.

Current literature suggests the use of nonionic contrast material when the likelihood of reaction to ionic contrast

material is high. The American College of Radiology (2001) criteria for the selective use of nonionic contrast material indicate that history of any allergy, regardless of the type of reaction or antigen, is a reason to use non-ionic contrast material selectively.¹⁰

However, what constitutes an allergy is unclear.¹¹

Conclusions

There is no literature to support seafood allergy as a specific, unique contraindication to the administration of ICM. Careful assessment should include inquiry of all potential risk factors, including the severity of prior reactions related to *any* substance, a history of

asthma, or the current use of beta-blockers. Most adverse events from the intravascular administration of ICM occur at random and are unpredictable. Severe and life-threatening reactions can occur at any time, and fatalities have occurred after injection of both ionic and nonionic contrast material.^{1,12} Pre-testing with a small dose of ICM is of no use because this has induced fatal reactions, and some patients who failed to react to the test dose have had severe reactions.^{1,4,5} Most importantly, all physicians and health care professionals who conduct intravenous contrast studies must be well versed in the recognition and treatment of life-threatening reactions and have life-saving supplies and equipment immediately available.^{4,5} The emergency department, with its ability to monitor patients closely and with the skilled staff and equipment necessary to perform resuscitation, is well suited for this task.

Competing interests: None declared.

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Anaphylactoid Reactions to ICM

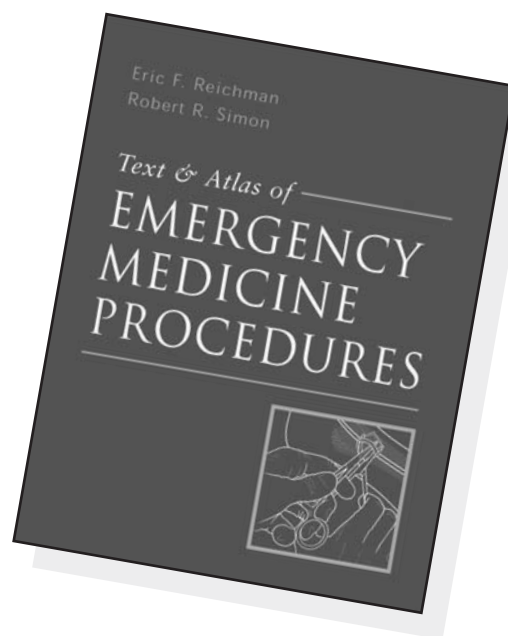
- Random and unpredictable events.
- May occur with either ionic or low-osmolar agents.
- Patients with asthma, previous allergic reactions, and on beta-blockers appear to be at increased risk.
- Pre-testing is of no value.
- Pre-treatment of high-risk patients with steroids may reduce the severity of reactions.
- Life saving supplies and equipment must be immediately available.
- Health care providers using these agents must be familiar with the recognition and treatment of reactions.

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