



Radioiodine Treatment of Grave's Disease Despite History of Iodine Allergy

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Abstract

Graves's disease is the most common cause of hyperthyroidism. There are three current therapeutic options: anti-thyroid medication, surgery, and radioactive iodine (I 131). We describe a 47-year-old patient who had Grave's disease and has a history of an anaphylactic reaction to computed tomography (CT) contrast agent. She came to our institute for further management of her hyperthyroidism. We advised radioactive iodine treatment, which did not carry any reaction in the patient. The patient agreed with this analysis and successfully underwent treatment with 12 mCi (444 MBq) radioactive iodine. The patient was followed up for 2 weeks after radioactive iodine treatment with no problems during or after the treatment.

Introduction

Graves's disease is the most common cause of hyperthyroidism. There are three current therapeutic options: anti-thyroid medication, surgery, and radioactive iodine (I 131). Radioactive iodine is generally well tolerated but when is its use if allergic to iodine with anaphylactic shock history?

Case Presentation

A 47-year-old woman with a Grave's disease history came to our institute for further management of her hyperthyroidism. The patient stated that she had anaphylactic shock 2 years ago after being administered iodinated contrast for a CT scan. She experienced shortness of breath, hives, loss of consciousness, and dry heaves. Since that time, she had not taken any further iodinated contrast agent and avoided taking drugs that he knew contained iodine. She denied any adverse effects with taking thyroid supplementation. The patient initially refused radioactive iodine treatment. Because of the experience she had with the CT contrast agent, she believed that she had an iodine allergy and as a result could not undergo radioactive iodine treatment. We explained to the patient that an allergy to elemental iodine does not exist and that her daily salt intake contains iodine and she did not have any reactions with these substances. The patient agreed with this analysis and successfully underwent treatment with 12 mCi (444 MBq) radioactive iodine. The patient was followed up for 2 weeks after radioactive iodine treatment with no problems during or after the treatment.

Discussion

Iodine is a trace element that is present in many items including sea food, salt, antiseptics, or radio contrast materials. The current literature argues that a pure allergic reaction to iodine does not exist. Simple atoms such as iodide itself or simple iodide salts are stated to not have the complexity required for antigenicity [1,2] Iodine may cause adverse reactions such as iododerma or iodide mumps. However, such reactions are usually related to large amounts of iodine and may not be allergic in nature [3]. Allergies to seafood have been mistakenly blamed on the iodine in the seafood. Allergic reactions to seafood are apparently caused by IgE-mediated reactions against several proteins, such as parvalbumins in fish and tropomyosins in crustaceans and mollusks [4,3]. Several topical antiseptics contain iodine. In addition to that, they contain povidone, a polymer similar to the structure of dextran. When combined with iodine, the polymer carries iodine to bacteria, causing bacterial death. Povidone-iodine causes rare irritant dermatitis. There are several reports of non-iodinated povidones causing contact dermatitis and anaphylaxis. These reports have concluded that the allergy is likely against povidone and that iodine may not play a role [3,5]. Nunez "et al." [6] reported the case of a patient who received radioactive iodine for a thyroid scan and for treatment of papillary thyroid carcinoma [6]. Approximately, 30 min after ingestion of both radioactive 123I and 131I, the patient developed a severe urticarial rash, which disappeared after several hours. The key to

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this puzzle turned out to be that both treatments were administered in capsules that came from the same distributor. The capsules contained sucrose powder, titanium dioxide, FDC red 40, and DNC yellow 10. When the patient was given radioactive iodine in liquid form, she did not develop any complications, skin rashes, or other reactions after radio iodine treatment, implying that the contents of the capsules used in previous treatment may have been the agent inciting the allergic reaction noted [6].

Our patient clearly had an allergy to radio contrast material used for CT scanning. Our analyses suggest that this information is not a contraindication to receiving radioactive iodine for scanning and/or treatment purposes. A typical dose of radioactive ¹³¹I used in treatment of Grave's Basedow disease is ~12–15 mCi (444–555 MBq), averaging 15 mCi (555 MBq) with the specific activity of ¹³¹I being about 5 Ci/mg. It can be calculated that 12 mCi of radioactive ¹³¹I would contain ~20.4 µg of sodium iodide. This would mean that the dose of iodine in 12 mCi of radioactive iodide is ~20000 times smaller than that in a standard CT contrast dose containing about 350 mg of iodide [3,4]. Moreover, he was taking a normal salt diet without worrying about its iodine content. Normal daily salt intake is ~5–10 g/day. Assuming an iodine supplementation of some ten parts per million, this amount of salt would be expected to contain 50–100 µg of sodium iodide that our patient consumed daily without any reaction.

Unfortunately, there is a lot of misinformation and confusion about the issue of iodine allergy not just in the public, but also in the medical community. When faced with this issue, physicians do not perform useful procedures with radioiodine and/or patients may be hesitant to accept treatment that is otherwise needed [1,7].

Conclusion

In treating Grave's Basedow disease, iodine is a key and necessary component of treatment. The term 'iodine allergy' is a misleading term that should not confuse patients and medical community. Asking a patient if he/she is "allergic to iodine" is a question that should be avoided because its significance is null.

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