

High-dose radioiodine outpatient therapy

Radioiodoterapia ambulatorial de alta dose

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The number of patients who need radioiodine therapy (RIT) after surgical excision of thyroid tumors has been rising in Brazil, as well as the number of differentiated thyroid carcinomas detected by ultrasonography. Likewise most international guidelines, the consensus on thyroid cancer from the Department of Thyroid of the Sociedade Brasileira de Endocrinologia & Metabologia (Brazilian Society of Endocrinology and Metabolism, SBEM) recommends radioiodine remnant ablation to all patients submitted to a total thyroidectomy, with the exception of a very-low-risk patient (T1N0M0, with single tumor completely excised) (1). The rationale is to destroy any remaining tumor and to improve the ease of follow-up by eliminating all follicular cells, thereby making serum thyroglobulin (Tg) dosage a more specific marker of recurrent or persistent disease. The procedure is not mandatory in patients categorized as low risk and very low risk and can be accomplished, in some instances, by a single ¹³¹I dose of 30 mCi (equivalent to 1100 Mbq), which delivers about 10 whole-body rads to the patient, although most endocrinologists prefer to administer a dose of 100 mCi. Brazilian regulations impose the hospitalization of all patients treated with doses higher than 30 mCi; however, unfortunately, the number of facilities enabled to administrate high-dose radioiodine has not increased in the same proportion of the cases in need of these doses, and the limited number of available ward beds has aggravated the patients' troubles. Because we usually withhold thyroid hormone therapy, waiting for the radioiodine ablation of thyroid remnants after surgery, many patients have remained hypothyroid for much longer than the expected four to six weeks necessary to elevate their serum TSH levels (1). Also, withdrawal of thyroid hormone has been the standard procedure over the last decades to increase TSH, thereby enhancing the sensitivity of Tg measurement and increasing radioiodine uptake by recurrent thyroid tumors (1). Hence, high-risk patients submitted to control whole-body scans frequently have to endure the ordeal of hypothyroidism and the risk of tumor cell stimulation due to elevated TSH levels, which many times takes much longer than expected.

The publication of Sapienza and cols. (2), demonstrating the feasibility of high-dose radioiodine outpatient therapy, holds out hopes for a new scenario for Brazilian patients. The authors did not detect any significant environmental impact of the administration of 100 to 150 mCi of ¹³¹I to 20 outpatients. They monitored 27 family caregiver members, who were given personal dosimeters and were asked not to modify their common routine. In 26 out of these individuals, the dose of ¹³¹I received was lower than 1 mSv during the observation period. Even the one individual, who disobeying the medical recommendations, remained close to the patient for a long time, received a dose of ¹³¹I (2,8 mSv) that did not exceed the 5,0 mSv value considered acceptable for caregivers (2). Although we need to increase the number of patients

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treated with the author's protocol and it is necessary to study its application in different cities and by other groups or services that treat thyroid cancer patients, in order to confirm its larger feasibility in Brazil, this first report provides compelling evidences on the safety of high-dose administration on an outpatient basis.

The safety of the dose administration differs from country to country, according to the local interpretation of the International Atomic Energy Agency (IAEA) recommendations. The cornerstone criteria are dose limits for the public and dose constraints for relatives and caregivers. Different measures have been adopted, according to the International Basic Safety Standards (BSS), in the construal of maximum activity allowed for patients and caregivers in different countries and even in hospitals from the same country. A series of recent publications have reported actual measurements and external dose rates, as well as contamination potential that indicates that most countries are overly restrictive (3-7). Using a mathematical model, Coover and cols. (8) developed charts that took occupancy factors into account. The results indicate that most outpatients undergoing RIT for thyroid cancer may be safely treated with 7400 MBq (200 mCi) or more (8). A recent simulation study published by a Brazilian group, which used the Visual Monte Carlo radiation transport code and the female voxel phantom to calculate organ and effective irradiation doses delivered by RIT also concluded for the safety of a 300 mCi (11100 MBq) dose to a patient receiving daily care at home (9).

The Nuclear Regulatory Commission revised the criteria for RIT in the United States in 1997 and, theoretically, allowed patients requiring doses as high as 9,250 MBq (250 mCi) to be discharged from the hospital immediately after receiving the radioiodine dose (10). Currently, in Europe, in the United States and in some Latin American countries, such as Argentina, competent and cooperative patients are routinely discharged with activities as high as 8000 MBq (216 mCi), provided that they abide certain restrictions. The current dose constraints proposed in a number of publications include: children and fetuses, 1 mSv; adults up to 60 years of age, 3 mSv; adults over 60 years of age, 15 mSv; third persons, such as drivers of vehicles used for patient transport or general public, 0.3 mSv.

Sapienza and cols. (2) add data to previous reports on the safety, cost-effectiveness and patient acceptance of high dose ¹³¹I therapy delivered on an outpatient ba-

sis (5-7). The levels of contamination were lower than regulatory limits. Patients and caregivers had no difficulty complying with requirements for radiation safety. Concerns about persons who provide direct care to the patient actually following regulations will always exist, but these results suggest that, for a well-selected and screened group of thyroid cancer patients receiving outpatient RIT, the procedure is safe and does not subject any family member or member of the public to the risk of exceeding accepted limits for public exposure to radiation.

The implication of the study is the urgent need for revision of our public policies and the prompt implementation of larger outpatient RIT protocols throughout the country. This should make the therapy more convenient and widely available, as well as reduce patient care costs.

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