

## **SOME ASPECTS OF THERAPEUTIC USE OF RADIOACTIVE ISOTOPE IODINE 131 I**

Therapeutic use of  $^{131}\text{I}$  is a safe and efficient for controlling hyperthyroidism and carcinoma of the thyroid but certain methodological criteria have to be met before administering radioiodine. A  $^{131}\text{I}$  is used for therapy by virtue of its large beta particulate emissions of moderate energy delivering 90% of the energy of decay within a 0.5 – 1 mm zone, associated with an 8-day half-life. Among various effects, the radionuclide deposited in the tissues results in ionization of the thyroid cell which in turn, leads to the prolongation of  $G_0$  phase in cell cycle, damage of DNA and enzymes. These events result in a delay or inhibition of the division of the thyroid cell. Depending on the dose administered, this will allow to reach the goal of the treatment, i.e. lowering thyroid hormone production and/or achieving thyroid tissue destruction. Tracer uptake studies will assess the avidity of the gland for iodine and are recommended to be calculated in grays i.e. the radiation given to the gland. Because of the heterogeneous distribution of the radioisotope, a higher dose of  $^{131}\text{I}$  is given in multinodular goiter as compared to diffuse hyperplasia. Relatively higher dose of  $^{131}\text{I}$  are also needed in toxic adenoma, probably because of the biological properties of the autonomous thyroid tissue. Reasonable compromises have obviously to be found in order to allow the patient to continue to benefit from radioiodine therapy and at the same time, to minimize the radiation hazards to the public.