EFFECT OF 20 μc ^{131}I DOSES ON PROTEIN-BOUND IODINE CONCENTRATIONS IN SERUM

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The use of tracer doses of radioiodine for studying thyroid function in patients has now been standard practice throughout the world for over 15 years. The quantity of ^{131}I administered for these investigations varies from 5 μc for the urinary-excretion test of ^{131}I to 50 μc for neck uptake measurements, the assay of plasma protein-bound radioiodine at 48 hr and scanning investigations (*1,2*).

Recently Diengott and Boxer (*3*) have reported that the chemical protein-bound-iodine level in serum before a 40-μc ^{131}I dose is reduced 48 hr later. They have suggested that these observations may be explained by the effect of the radiation dose to the thyroid gland.

In this article, we report results of a study of chemical protein-bound-iodine levels over the same period after administering 20 μc ^{131}I.

METHOD

The chemical protein-bound-iodine (PB^{127}I) level of serum from patients undergoing routine thyroid investigations was measured just before the oral administration of 20 μc of ^{131}I as sodium iodide using the method of Zak *et al* (*4*). This estimation was repeated on samples of serum taken from the same patients 48 hr later.

RESULTS

A summary of the results which are divided into three groups is presented in the table. Group I contains the chemical protein-bound-iodine concentration of patients with neck uptakes below 30% of the dose of 24 hr corresponding to the upper limit for hypothyroid function. Group II contains results from patients with neck uptakes between 30% and 50%, and Group III includes results from patients with neck uptakes above 50% at 24 hr corresponding to the lower limit for hyperthyroid function.

TABLE 1. SERUM CHEMICAL PROTEIN-BOUND-IODINE CONCENTRATIONS*

Group	Number in group	PB ^{127}I μg/100ml Before ^{131}I	After ^{131}I	t
I	14	4.3 ± 3.0	4.2 ± 2.6	$P > 0.9$
II	28	5.5 ± 2.2	5.3 ± 1.8	$0.8 > P > 0.7$
III	13	9.1 ± 3.1	9.1 ± 3.4	$P > 0.9$

* Before and 48 hr after oral 20-μc dose of ^{131}I.

These results contrast with those obtained by Diengott and Boxer. We found no significant difference between the mean of our series of PB^{127}I estimations before and 48 hr after the radioiodine dose using the paired t test, $P > 0.7$ in each of our three groups. Diengott and Boxer evaluated their results in two groups, one above and the other below the upper limit of normal of 8.0 μg/100 ml for their PB^{127}I values. A similar analysis of our results based on an upper limit of normal of 7.5 μg/100 ml again showed no significance between the mean values of PB^{127}I before and 48 hr after the radioiodine dose.

Although the effects observed by Diengott and Boxer may be due to the radiation dose delivered to the gland from 40 μc ^{131}I, other factors including geographical location have not been ruled out. We feel that since modern detecting instruments are available which will measure ^{131}I with high efficiencies, any possible changes in the chemical protein-bound-iodine concentrations in serum due to radiation dose will be reduced by using only 20 μc for thyroid-function tests.

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