

Long-term Results of Radioiodine Therapy of Graves' Disease and Evaluation of Low Dose Treatment

T. OKUNO, K. NAKAJIMA, K. KASAGI, K. ENDO, J. KONISHI, T. MORI and K. TORIZUKA
Department of Nuclear Medicine and Radiology, Kyoto University School of Medicine, Kyoto

In 1977, we performed a follow up examination of the patients with Graves' disease treated with radioiodine 4 to 21 years before. Among 672 patients, 533 cases were given our conventional dosage of ^{131}I , a mean initial dose of 5.2 mCi between 1956 and 1970. The rest treated between 1971 and 1973, were given a lower initial dosage, i.e. about 4 mCi invariably. 113 cases of conventional dosage and 41 of low dosage group were examined. The result was evaluated by clinical features and free T_4 index (FTI). The incidence of hypothyroidism was 37.2% in the conventional dosage group. By using the life table method, an average annual increase of this complication was found to be approximately 3%. Incidence of hypothyroidism in older patients above 40 years of age at treatment was significantly higher than younger. This tendency was evident in the group given more than 100 $\mu\text{Ci/g}$ of ^{131}I . Among 6 patients with increased

TSH and normal FTI 2 to 4 years before, 4 was found to be hypothyroid, supporting the latent hypothyroid state of these subjects.

The result of the treatment in the low dosage group was compared with that of the conventional dosage group studied in 1971. At 4 years after the treatment, no case of hypothyroidism was found in contrast to 6% in the control. But 37% of the former still remained thyrotoxic, twice as high as that in the latter.

At 6 years thyrotoxic patients decreased in number, but hypothyroid cases appeared, reaching 27% at 6 years after treatment. In the control group, hypothyroid patients were found 36% after 6 years.

These data indicate that the low dose treatment can cause the delay in its appearance, but not prevent the ultimate development of the late onset hypothyroidism.

I-131 Concentration in Air Measured at an I-131 Treatment Ward

Noboru ARIMIZU*, Kenji SAEGUSA*, Tetsuo YAMAMOTO*,
 Shozo HONGO** and Tadashi YASUMOTO**

**Department of Radiology, Chiba University Hospital*

***Department of Environmental Hygiene, National Institute of Radiological Sciences, Chiba*

The maximum radioactive concentration in air is regulated by law not to have excess in using radiopharmaceuticals. The concentration in air can be calculated by applying volatilization ratio of nuclides from a patient, dimensions of a ward, a number of ventilation and an amount of radiopharmaceuticals administered. Volatilization ratio, however, was difficult to be exactly determined in routine uses. The authority in charge of medical regulation indiscriminately demands values (1/100) applied to the ordinary physical and chemical experiments, resulting in overmuch ventilation at a patient ward of an I-131 treatment, coming up more than several-ten times ventilation per

hour. This makes much severe circumstances for living of a patient.

The purpose of the study is to attempt direct measurement of I-131 concentration in air at the treatment ward for obtaining actual informations concerning I-131 volatilization ratio. The method of measurement was based on the effective trap of I-131 by using high-performance charcoal filters, which were capable of trapping more than 90% of I-131 out of filtered air. The measurement was performed on two cases with thyroid carcinoma administered 100 mCi and 83 mCi and three cases with hyperthyroid administered 1.8 mCi, 5 mCi and 5 mCi respectively. The forced ventilation