

Adrenal Scintiphotographic Study with ^{131}I -Adosterol (Second Report)

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The adrenal scintiphotography is performed on the 7th, 8th and 9th day following the intravenous administration of 1 mCi of ^{131}I -adosterol by N.C. Pho Gamma III or O.N. 100 scinticamera. The cases subjected to study are 10 cases of primary aldosteronism and 10 suspected, 4 cases of Cushing syndrome and 3 suspected, and 2 cases of pheochromocytoma and 11 suspected.

The lesions are clearly demonstrated as a hot spot, in all operatively varified cases of primary aldosteronism, Cushing syndrome, and pheo-

chromocytoma respectively.

The normal adrenal glands, are either normally visualized or not visualized. In the primary aldosteronism, the lesions visualized are ranged in the size of 13 to 27 mm. In the Cushing syndrome, the lesions visualized are ranged in the size of 20 to 38 mm. In the pheochromocytoma, the lesions visualized are 40 mm in diameter.

The adrenal scintiphotographic study is useful to detect the lesions and/or to determine the side of lesion before the angiographic examination.

Scanning Studies of Adrenal Gland using ^{131}I -labeled Adosterol

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We made an attempt to clarify the role of 6 β -iodomethyl-I9-norcholest-5 (I0) -3 β -o1- ^{131}I (^{131}I -Adosterol, Ad) as an adrenal scanning agent.

Male rats were injected intravenously with 10 μCi of Ad and ^{131}I -I9-cholesterol (Ch). The rat adrenal accumulates about six times more Ad than Ch and retains a higher concentration at 8th day. The average concentration in the adrenal gland of Ch-dosed rats was 33.9%/g at 8th day while the Ad-dosed rats averaged 198%/g. The ratio of adrenal-to-liver concentrations at 8th day was 990 for Ad while that for Ch was 424. The ratio of adrenal-to-kidney concentrations at 8th day was 330 for Ad while that for Ch was 484.

Clinical scanning studies were made mainly in cases of Cushing syndrome. Ad is excreted mainly into the urine, decreasing with time comparatively fast. Further, the rate of its disappearance from the blood also decreased, almost running parallel with its disappearance from the urine. The changes in radioactivity of adrenal gland area were remarkable after intravenous injection, continuously remaining thereafter. Particularly high radioactivity was observed to result from large hepatic uptake. Scanning was conducted on 5th and 8th day, when body-background became low, to obtain clear scans.

The scans indicate that, in cases of bilateral

adrenal cortical hyperplasia, both adrenal gland uptakes were almost the same and much larger than those in normal cases. Further, in cases of adrenal adenoma, hot areas appeared clearly, though smaller than in cases of hyperplasia.

It was considered that Ad is by far a more effective adrenal-concentrating agent and are

possible diagnostic usefulness in man. However, a considerable uptake was observed also in normal cases were sometimes hardly distinguishable from hyperplasia of adrenal glands. These facts suggest that further clinical studies are necessary in this field.

Measurement of ^{131}I Adrenal Uptake in Various Adrenal Diseases

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Adrenal scanning with ^{131}I -19-iodocholesterol (^{131}I -19-CL) or 6 β -iodomethyl-19-nor-5(10)-cholesten-3 β -ol (^{131}I -6-NCL) is very useful for clinical diagnosis of various adrenocortical diseases. This report describes my experience in determining ^{131}I adrenal uptake as a measure of adrenocortical function. ^{131}I adrenal uptake was referring to a standard curve. The curve was constructed from a experiment in which radioiodines of known radioactivity were placed as adrenal phantoms at different depths in body phantom.

There was no significant difference in ^{131}I uptake of normal adrenals between ^{131}I -19-CL and ^{131}I -6-NCL.

^{131}I adrenal uptake ranged from 0.21 to 0.88 % and averaged in 0.51 ± 0.21 % in normal adrenals,

while it ranged from 0.84 to 2.72 % in 9 patients with primary aldosteronism and 3 patients with Cushing's syndrome and was significantly higher than that of normal adrenals. Right-to-left uptake ratio ranged from 1.05 to 1.60 and averaged in 1.37 ± 0.18 in normal adrenals, while it ranged from 2.05 to 6.32 in primary aldosteronism. Two patients with Cushing's syndrome caused by functional adrenocortical adenoma had R/L uptake ratio much greater than 9 patients with primary aldosteronism, probably due to the function of hormonal feed back mechanism.

There was fairly good correlation in primary aldosteronism between ^{131}I adrenal uptake and values of blood-analyses such as Na, K, Renin activity and aldosterone.