Radioimmunoassay of Human Chorionic Gonadotropin

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The biological activity and antigenicity of HGG were comparatively studied by radioimmunoassay (sensitivity 0.005 IU/ml) using ^{131}I and purified HGG (8.000~29,000 IU/mg specific activities).

The results thus obtained are as follows.

First of all, the antigenicity of HGG became the lower as the HGG was purified to the higher biological specific activity.

On the other hand, experiments on the relationship between the antigenicity and biological activity by various inactivation methods revealed that antigenicity of HGG is more resistent than biological activity to the treatment with heat, 6M-urea, 0.1 M KOCN, sialidase, α-chimotrypsin and streptokinase, indicating that the biologically active fragment of HCG was dissociated from the site of antigenicity.

Comparisons among biological activity, antigenicity and optical density (280 mμ) of each fraction of gel filtration on Sephadex G-100 or of DEAE-column chromatography also revealed that htere was a constant parallelism between the patterns of immunological activity and optical density, but the biological activity did not fluctuate in parallelism with the pattern of optical density.

Therefore, it is clear that in some conditions only a part of biologically active fractions can be detected by radioimmunoassay.

However, radioimmunoassay is useful in determination of small amount of HCG in fetal organs and blood, of LH in blood of nonpregnant women and in the diagnosis or follow-up of chorioma, as it detects a very little amount of HCG.

Radioimmunoassays of FSH and LH

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We have developed radioimmunoassays of FSH and LH in plasma sensitive enough to measure the normal levels in 10 μl of plasma respectively. HCG was used in place of LH for radioimmunoassay of LH.

In order to establish a specificity of assays, highly purified FSH and HCG were used for standards and iodination; antisera to FSH were absorbed with HCG and antisera to HCG were absorbed with FSH.

A Sephadex G-100 column (1×25 cm) was used for purification of ^{131}I-FSH or ^{131}I-HCG. The fractinos with minimum radiation damage at the tailing part of the FSH-^{131}I or HCG-^{131}I peak were used for assays.

The bound and free labelled hormones were separated by paperchromatoelectrophoresis or by dextran coated charcoal.

Good correlations between the bioassays and radioimmunoassays of FSH and LH were found in the purified pituitary and urinary fractions.

Our mean plasma FSH and LH levels in normal young men were 16.9 and 14.0 mIU 2nd-IRP-HMG respectively comparable with values reported previously. Values in prepubertal children were more than half of those in adults. Low plasma gonadotropin levels were observed in patients with hypopituitarism and in patients with congenital adrenal hyperplasia. High values were found in postmenopausal women, in patients with Klinefelter's syndrome and occasionally in patients with acromegaly and Cushing's syn-