HIGH SENSITIVE IMMUNOMETRIC ASSAY FOR TSH--
BASIC CONSIDERATIONS AND ITS CLINICAL
APPLICATIONS. K. Ichihara, N. Amino and
K. Kiyai, Department of Laboratory Medicine,
Osaka University School of Medicine, Osaka.

The conventional radioimmunoassay (RIA) using the principle of competitive inhibition
is not sensitive enough to distinguish TSH value of normal individual from that of
thyrotoxic patients. Recently reappraisal of immunoradiometric assay (IRMA), being facili-
tated by easy availability of monoclonal antibody against human TSH, lead to the
development of many commercial assay kits with more than 10 fold increase in sen-
sitivity (minimal detectable dose (MDD) of 0.2-0.05 µg/ml). The advantages of IRMA over
conventional RIA include (1) shorter incubation

Secondly, the high sensitive assay fa-
cilitates analyses of disorders with low or
suppressed TSH level, making the convention-
al TRH test almost of no use except in
special cases of hypothalamic disorders. The
basal values of TSH were found normal in
most cases of hypothyroidism. The pathologi-
cal significance of such TSH level is unknown. Thirdly, the assay is use-
ful to determine optimal dosage for thyroid hormone replacement therapy as
well as antithyroid drugs therapy. Fourthly, in our development of TSH IEMA for neonatal
screening of cretin, the high sensitivity
had an critical role in greatly reducing sample volume up to 5 µl of blood.

5-II

CLINICAL USE OF A HIGHLY SENSITIVE IMMUNO-
ASSAY OF GH IN PATIENTS WITH PITUITARY
DISORDERS. Yuzuru Kato1, Naoki Hattori1,
Yoshio Murakami1, Seiichi Hashida1, Eiji
Ishikawa2, Zen-iich Mohri3, Second Medical
Medical Clinic, Department of Medicine, Kyoto;
Department of Biochemistry1, Medical College
of Miyazaki, Miyazaki; and Research Institute1
Sumitomo Pharmaceutical Company, Takarazuka.

Using a highly sensitive and specific EIA
was detectable as little as 3 pg/ml of serum and
0.4 pg/ml of urine. The minimum

detectable quantity of GH was 50 pg/ml of
serum in the revised RIA. Plasmas GH values
determined by EIA and RIA were well

correlated. Basal plasma GH values in normal
subjects were mostly less than 500 pg/ml,
which were not determined by a conventional
RIA of GH. Plasma GH levels in a number of
patients with hypopituitarism were less than
50 pg/ml, which were only detectable by EIA.

Plasma GH levels after insulin-induced
hypoglycemia and GRF proved to be useful for
differentiating primary pituitary dys-
function from hypothalamic disorders. Urine
GH levels were well correlated to plasma GH
changes. It was possible, therefore, that the
pituitary function could be determined by measuring GH concentrations in the urine
samples obtained after stimulation tests or
for 24 hrs. It was also demonstrated that a
very small amount of GH release was
detectable in the superfusion system of the
pituitary adenoma cells in vitro. It is
concluded that a highly sensitive assay of
GH is very valuable for clinical use.