RECEPTOR ASSAY METHOD USING THE ISOTOPE LABELED ANTIBODY – DETERMINATION OF ANTIBODY FOR THYROIDAL PLASMA MEMBRANE BY POLYETHYLENE GLYCOL(PEG) METHOD

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LATS(Long acting thyroid stimulator) may be an antibody for the thyroid plasma membrane. We tried receptor assay using the isotope-labeled antibody(^{125}I-LATS). The principle of this method is the determination of displaced ^{125}I-LATS from thyroidal plasma membrane by the thyroid plasma membrane binding immunoglobulin(TPMBI) in test serum. LATS-I_gG without thyroidal antibodies was labeled with ^{125}I and the radioactivity that bound to the plasma membrane(PM) from human thyroid was used as ^{125}I-LATS

In the routine receptor assay, the PM, 0.1 ml of test serum, and ^{125}I-LATS were mixed. Then ^{125}I-LATS bound with the PM was determined after centrifugation. The optimal pH for binding of ^{125}I-LATS to the PM was about 7.5.

The TPMBI activity in normal subjects was about 27-31 %(TPMBI negative). High LATS positive serum in the patient with hyperthyroidism showed a strong TPMBI activity except one. The TPMBI activity was also positive in 70 % of LATS negative cases in the patients with hyperthyroidism. In hypothyroidism and simple goiter, the TPMBI activity was all negative. However, Hashimoto's sera with positive precipitating antibody(PT positive) for thyroglobulin (TG) showed high TPMBI activity in all cases. About 50 % of cases with high TRC in Hashimoto's sera also showed positive TPMBI activity. The TPMBI activity was not affected by absorption of TG antibody. Microsomal antibody in Hashimoto's disease was suggested to have an effect on the TPMBI activity.

The effect of human or bovine TSH or HCG or cholera toxin on the displacement of ^{125}I-LATS was examined. No significant displacement was observed.

This method is not specific to determine LATS, but this assay may be useful for examining the antibodies for thyroidal PM.

The following determination of TPMBI was performed by 3 % polyethylene glycol(PEG) method. The binding of ^{125}I-LATS to the PM in the presence of NHS(0.1 ml) was 50 %. Both LATS positive serum and PT positive serum showed dose-dependent displacement.

Change of the TPMBI activity in the serum of the patients with hyperthyroidism was examined after the treatment with radioisotope or antithyroid drug for 2 years. The TPMBI activity is often positive in the case with high thyroidal antibody besides positive LATS cases. Thus, change of the TPMBI activity with the negative sera of thyroidal activity was investigated. In 7 cases with high LATS activity the relation between LATS activity and TPMBI activity was observed. High LATS positive sera showed the positive TPMBI activity except one. LATS activity continued to the high level without any significant change in 4 cases, even if the patient symptom was subsided. However, LATS activity decreased gradually to negative when the patient symptom subsided to the euthyroid state in 2 cases. The TPMBI activity showed almost parallel change with LATS activity in all these cases.

In LATS negative cases, the TPMBI activity did not change significantly when the patient symptom continued to the hyperthyroid state after the treatment. In many cases the positive TPMBI activity continued as positive, and the negative TPMBI cases also continued as negative. However, the TPMBI activity in the subsided cases of the patient symptom showed gradual decrease in parallel with the subsidence of hyperthyroidism.