The Relation between Thyroid Function and the Changes of Blood Sugar and Blood Insulin on Arginine Tolerance Test

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Sugars and amino acids are representative insulin secretion stimulants, and blood sugar and blood insulin after administration of arginine showed considerably specific changes in the patients with hyperthyroidism together with the hyperthyroid patients received anti-thyroid therapy, and hypothyroid patients.

1) Blood sugar:

0.5 g of arginine per kg of a body weight was dissolved in 200 ml of physiological saline and dripped intravenously for 30 min. The blood sugar in normal patients drew biphasic curve having the maximum after 15 min and the minimum after 45–60 min. In the hyperthyroid patients the blood sugar increased very slightly and rather dropped in some one. The blood levels after 15 min were 16.7±1.7 mg/dl in normal patients, 5.1±3.1 mg/dl and −5.0±1.4 mg/dl in hyperthyroid patients having T₃ resin sponge uptake less than 50% and more than 50% respectively. When their thyroid function was improved by anti-thyroid agents, the blood sugar level 15 min after administration of arginine was 11.3±3.5 mg/dl, showing almost the same reaction with normal patients.

2) Blood insulin:

Blood insulin determined by radioimmunoassay (doble antibody method) drew almost the same curve with blood sugar, increasing 13.0±0.3 uU/ml in normal patients after 15 min, 8.4±1.9 uU/ml and 2.6±2.9 uU/ml in the hyperthyroid patients having T₃ resin sponge uptake less than 50% and more than 50% respectively. The blood insulin after 15 min increased 33.4±7.8 uU/ml when hyperthyroidism was improved by therapy. Hypothyroid patients showed remarkable increase of the blood level.

Radioimmunoassay of Pancreatic Glucagon

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In the previous meeting, we have reported a sensitive radioimmunoassay of glucagon utilizing talc to separate free from bound fractions. Since a specific antiserum to pancreatic glucagon has recently become available, we performed experiments to evaluate usefulness of this antiserum as well as clinical application of radioimmunoassay of glucagon.