ASSESSMENT OF INSULIN SENSITIVITY BY STEADY STATE PLASMA GLUCOSE USING SOMATOSTATIN IN SPONTANEOUSLY HYPERTENSIVE RATS. Luzia Furukawa, Toshiro Kushiro, Tomoko Asagami Atsuhiko Takahashi, Hirofumi Tomiyama, Tohru Hino, Tatuya Okabe, Fumio Saitoh, Fumiuyuki Kobayashi, Hitoshi Kurumatani, Yuhji Otsuka, Tsugio Osada, Nagao Kajiwara, Katsuo Kanmatsuse. Department of Cardiology, Surugadai Nihon University Hospital, Tokyo 101.

Recently, insulin resistance has been received attention as it plays an important role in essential hypertension as well as in pathogenesis of atherosclerosis. In spontaneously hypertensive rats (SHR), existence of insulin resistance is controversial. Some investigators demonstrated SHR is insulin resistant, but some did not. Beside with age and source of rats, methodological differences to assess insulin sensitivity may be responsible for the disparity. Although steady state plasma glucose (SSPG) using epinephrine and propranolol has been applied in rats, endogenous insulin secretion could not be sufficiently suppressed and the method is not suitable to investigate hemodynamic parameters because these agents influences sympathetic activity. We evaluated insulin sensitivity by SSPG using somatostatin, since somatostatin suppresses insulin secretion sufficiently and it does not influence hemodynamics. In this experiment, we also assessed insulin sensitivity by hyperinsulinemic euglycemic clamp as a conventional and established method.

Methods: In 9 week old SHR and in Wistar Kyoto rats (WKY), catheters were implanted unilateral, the jugular vein and the carotid artery before at least 24 hours SSPG performed.

In SSPG, after mean arterial pressure (MA) and heart rate (HR) recording somatostatin (Octreotide:50ug/kg) injected bolus which was followed by infusion of octreotide 0.077ug/kg/min, glucose 8mg/kg/min and insulin (Actrapid) 3mU/kg/min. At 150 after the initial of infusion, SSPG, plasma insulin (SSPI) and potassium were measured.

In hyperinsulinemic euglycemic clamp, insulin was infused 8.0 mU/kg/min for about 120 minutes and the dose of glucose required (GR) to maintain normal plasma glucose was determined.

Results: Neither SSPG nor GR was not significantly different between SHR and WKY. The SSPG to SSPI ratio and potassium were not different either (table).

	MAP (mmHg)	Heart rate (bpm)	SSPG (mg/dl)	SSPG/SSPI	GR (mg/kg/min)	K (mEq/ml)
SHR	161±9*	460±15	164±11	1.5±0.4	30±5	4.4±0.1
WKY	110±1*	321±13	155±7	1.4±0.1	34±4	4.4±0.1

* p<.05 vs WKY

Conclusions

The facts that insulin sensitivity in SHR and in WKY assessed by both SSPG and clamp methods did not differ suggest that SHR is not insulin resistant, or WKY is not a suitable control for SHR in investigating the relation between insulin resistance and hypertension.