

Topic: Other (Neuroendocrinology)

Insulin in the Carotid Sinus Increases Suprahepatic and Arterial Glucose Levels

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Introduction: Insulin is a well-known enzyme but there are some relationships that remains not completely clear in rats.

Objective: To analyze the effects of this hormone infused into the isolated carotid sinus (ICS), on suprahepatic and arterial glucose levels.

Material and Methods: All procedures were carried out in accordance with the United States National Institutes of Health. Ten male Wistar rats 280-300 g anesthetized with sodium pentobarbital (5 mg /100 g i.p.) after 12 h fasting were randomly divided into control and experimental groups. Saline (100µL) or insulin (15 mIU/rat in 100 µL saline) was injected into the ICS. To blood collection, the catheters in the suprahepatic vein (SHV), starting in the jugular vein and into the femoral artery (FA) were placed. Glucose levels were determined at -10 and -5 min before saline or insulin were injected in the ICS; and 1, 5, 10, 20, and 40 min after the above injection.

Results: Insulin injection significantly increased glucose levels in the SHV from 128.8 ± 5.2 mg/dL to 207.4 ± 10.6 mg/dL ($p = 0.00005$), while in the FA they increase from 123.4 ± 6.7 mg/dL to 199.8 ± 9.6 mg/dL ($p = 0.0008$) at 40 min after insulin injection. Control group with saline did not show significant changes ($p = 0.97$ in FA) and ($p = 0.34$ in SHV). The comparison between both groups was significant on arterial ($p = 0.007$) and venous ($p = 0.003$) blood glucose levels. **Conclusions:** As other studies, report an overactivation of the carotid bodies and sympathetic activity increase after insulin injections in the carotid artery, we assume that insulin in the carotid bodies activates hepatic glycogenolysis to increase blood glucose levels (hyperglycemia) (figure).

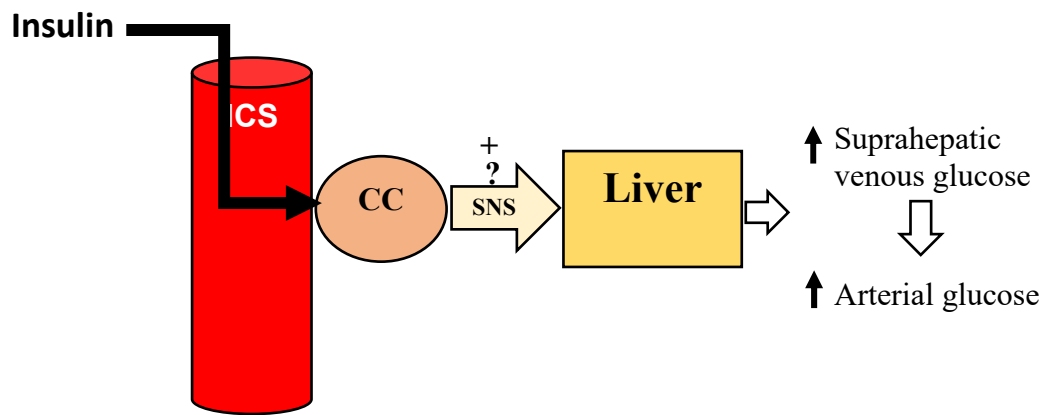


Figure. Graphical abstract. CC, carotid body; ISC, isolated carotid sinus; SNS, sympathetic nervous system; +, activity increased.