The Effects of Insulin on Secretion of Angiotensin II in Human Adipose Tissue

Young-Ran Heo[1], Hyeon-Sook Lim[2], Young-Sook Lee[1], Don-Hee Park[3], Naima Moustaid[4]

[1]Chonnam Research Institute of Nursing Science, Medical School,
[2]Dept. of Food and Nutrition, [3]Faculty of Applied Chemical Engeering, Institute of Bioindustrial Technology, Chonnam National University, Kwangju 500-757, Korea
[4]Dept. of Nutrition, University of Tennessee, Knoxville, TN, 37919, USA
TEL: +82-62-220-4343, FAX: +82-62-227-4009

Abstract

Adipose tissue has been recently recognized as an endocrine tissue that secretes several molecules, such as angiotensin II (Ang II), a well known hypertensive hormone. Adipocytes are highly responsive to nutritional and hormonal stimuli. Some studies suggest that obesity may be associated with resistance to the effect of insulin to suppress AGT gene expression in animal model. However, mechanisms that contribute to regulation of secretion of this hormone in human adipose tissue are unknown. In this study, we investigated the effects of insulin on Ang II secretion from adipose tissue obtained from 12 female subjects. Ang II secretion varied with wide range and positively correlated with BMI and adipocyte size. The insulin induced significant decrease on Ang II secretion from adipose tissue. There was no difference in responsiveness on Ang II secretion between normal and obese subjects. The glucose flux induced significant increase on Ang II secretion, however, insulin with glucose flux into adipose tissue induced increase on Ang II secretion independent of insulin treatment. Taken together, these results indicate that Ang II secretion from adipose tissue is normally regulated positively by glucose and negatively by insulin in both normal and obese subjects. However, further study is needed on responsiveness in insulin with glucose flux in various physiological condition represented disease status.

References

1. Umeda M, Kanda T, Murakami M (2003) Effects of angiotensin II receptor antagonists on insulin resistance syndrome and leptin in sucrose-fed spontaneously hypertensive rats. *Hypertens Res* 26(6): 485-492.
2. Engeli S, Schling P, et al. (2003) The adipose-tissue renin-angiotensin-aldosterone system: role in the metabolic syndrome? I*nt J Biochem Cell Biol* 35(6): 807-825.