

LETTER TO THE EDITOR

Insulin secretion and capsaicin

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Dear Sir:

Many studies in the medical literature have indicated that the consumption of chili-containing meals increases energy expenditure and fat oxidation. Moving toward this direction, a new study regarding the metabolic effect of a capsaicin chili-containing meal after the consumption of a bland diet and a chili-blend-supplemented diet was performed by Ahuja et al (1). The authors concluded that regular consumption of chili may attenuate postprandial hyperinsulinemia. To our knowledge, many studies have reported different effects of capsaicin on glucose metabolism, implying that several factors may be responsible for or may interact with capsaicin at a molecular level, receptor level, or both. In one of the first studies of the effects of capsaicin on glucose metabolism, Karlsson et al (2) showed in mice that both the early (1-min) insulin secretory response to intravenous glucose and glucose elimination were potentiated after capsaicin administration, whereas basal insulin concentrations were not affected by capsaicin. Similarly, in their experimental studies in rats, Gram et al (3) reported that the mean blood glucose concentration decreased and the plasma insulin concentration was unchanged during an oral-glucose-tolerance test (OGTT) after capsaicin administration, whereas the administration of a tolerable analogue of capsaicin suitable for in vivo use (resiniferatoxin) was accompanied by an increased insulin response to oral glucose (4). In addition, Akiba et al (5) showed in another study in rats that systemic administration of 10 mg capsaicin/kg (subcutaneously) dose-dependently increased insulin secretion and plasma insulin concentrations 1 h after treatment. Other experimental studies conducted by Tolani et al (6, 7) showed that purified capsaicin caused a decrease in blood glucose concentrations in dogs during an OGTT and a concomitant elevation in plasma insulin concentrations. Another study of insulin metabolism after oral application of capsaicin by Domotor et al (8) conducted in healthy human subjects showed that, although the plasma concentrations of insulin increased from 90 to 165 min after glucose loading, there were no significant differences between the results obtained with and without capsaicin administration. Although many studies of the role of capsaicin in carbohydrate metabolism have been performed on animals, most of which showed that (contrary to the results of Ahuja et al) capsaicin is associated with increased insulin secretion, most of these studies were conducted under different experimental circumstances and, although adding some evidence for a better understanding of the role of capsaicin in carbohydrate metabolism, their results are hardly comparable. However, to date, there is a paucity of human studies on the effects of capsaicin on glucose metabolism. In conclusion, it seems that several influencing and confounding factors, as well as differences in animal and human metabolisms, could at least partly explain why the results of the study by Ahuja et al contrasted with those of other studies. Although the time of a clinical application of capsaicin analogues in treating metabolic disorders such as diabetes is still distant, and even though there is a lack of more

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solid evidence, we believe that larger-scale clinical trials are needed.

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REFERENCES

1. Ahuja KDK, Robertson IK, Geraghty DP, Ball MJ. Effects of chili consumption on postprandial glucose, insulin, and energy metabolism. *Am J Clin Nutr* 2006;84:63–9. [[Abstract/Free Full Text](#)]
2. Karlsson S, Scheurink AJ, Steffens AB, Ahren B. Involvement of capsaicin-sensitive nerves in regulation of insulin secretion and glucose tolerance in conscious mice. *Am J Physiol* 1994;267:R1071–7. [[Medline](#)]
3. Gram DX, Hansen AJ, Wilken M, et al. Plasma calcitonin gene-related peptide is increased prior to obesity, and sensory nerve desensitization by capsaicin improves oral glucose tolerance in obese Zucker rats. *Eur J Endocrinol* 2005;153:963–9. [[Abstract/Free Full Text](#)]
4. Gram DX, Hansen AJ, Deacon CF, et al. Sensory nerve desensitization by resiniferatoxin improves glucose tolerance and increases insulin secretion in Zucker Diabetic Fatty rats and is associated with reduced plasma activity of dipeptidyl peptidase IV. *Eur J Pharmacol* 2005;509:211–7. [[Medline](#)]
5. Akiba Y, Kato S, Katsube K, et al. Transient receptor potential vanilloid subfamily 1 expressed in pancreatic islet beta cells modulates insulin secretion in rats. *Biochem Biophys Res Commun* 2004;321:219–25. [[Medline](#)]
6. Tolan I, Ragoobirsingh D, Morrison EY. Isolation and purification of the hypoglycaemic principle present in *Capsicum frutescens*. *Phytother Res* 2004;18:95–6. [[Medline](#)]
7. Tolan I, Ragoobirsingh D, Morrison EY. The effect of capsaicin on blood glucose, plasma insulin levels and insulin binding in dog models. *Phytother Res* 2001;15:391–4. [[Medline](#)]
8. Domotor A, Szolcsanyi J, Mozsik G. Capsaicin and glucose absorption and utilization in healthy human subjects. *Eur J Pharmacol* 2006;534:280–3. [[Medline](#)]

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