Acarbose and Postprandial Hypotension

To the Editor:

We read with interest the article by Shibao et al., who reported that acute administration of acarbose had a substantial, beneficial effect on the hypotensive response to a high-carbohydrate meal in patients with autonomic failure. It was suggested that this effect is mediated, at least in part, by a reduction in the insulinemic response to a meal. We are disappointed that the authors do not refer to studies conducted by ourselves and others which have established that the rate of gastric emptying2-3 and the consequent exposure of the small intestine4 to nutrient is a major determinant of the hypotensive response to glucose in healthy older subjects and type 2 patients and that acarbose has the capacity to slow gastric emptying and to stimulate the secretion of the “incretin” hormone, glucagon-like peptide-1.5

A role for gastric emptying was confirmed by demonstrating, in healthy older subjects, that the magnitude of the fall in blood pressure and rise in heart rate was substantially greater when glucose was infused intraduodenally at a rate of 3 kcal/min when compared with 1 kcal/min, these rates being within the normal physiological range.2 Conversely, gastric “distension” appears to attenuate the postprandial fall in blood pressure. In 8 healthy older subjects, we, like Shibao et al., reported that acarbose (100 mg) attenuated the fall in systolic blood pressure and increase in heart rate induced by oral carbohydrate (100 g of sucrose in 300 mL of water), and, as expected, suppressed postprandial glycemia and insulinemia.5Although these effects may be attributable to slowing of the small intestinal digestion of carbohydrate, acarbose also retarded gastric emptying substantially (and, accordingly, both decreased the delivery of nutrients to the small intestine and prolonged gastric distension), although this was only evident ≈90 minutes after the drink, whereas the fall in systolic blood pressure was evident well before this time.5 We also confirmed that acarbose stimulated glucagon-like peptide-1 from ≈60 minutes; because glucagon-like peptide-1 is released from intestinal “L cells,” which have their greatest density in the distal small intestine, this probably reflected the presence of unabsorbed sucrose.5 In contrast, the release of the other incretin hormone, glucose-dependant insulinotropic polypeptide, from duodenal “K cells” was suppressed by acarbose.5 The stimulation of glucagon-like peptide-1 may contribute to the effects of acarbose on both postprandial blood pressure and gastric emptying.5

As Shibao et al.1 point out, postprandial hypotension is a frequent disorder that represents a major cause of morbidity and mortality for which current treatment options are limited and, in most cases, suboptimal. We believe that pharmacological and/or dietary strategies that result in the slowing of gastric emptying and/or small intestinal carbohydrate absorption are likely to prove effective in the management of postprandial hypotension. Given our observations in healthy older subjects5 and those of Shibao et al.1 in patients with autonomic failure, it is likely that acarbose represents a therapeutic option for the management of postprandial hypotension and that multiple mechanisms mediate its effect. It will be important to determine whether the beneficial effects of acarbose are sustained during chronic administration.

Sources of Funding

D.G.’s salary is supported by a National Health and Medical Research Council (NHMRC) of Australia Australian Clinical Research Fellowship (grant ID: 456441). K.L.J.’s salary is funded jointly by Diabetes Australia and the NHMRC of Australia.

Disclosures

None.

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_Hypertension_. 2007;50:e159; originally published online September 10, 2007;
doi: 10.1161/HYPERTENSIONAHA.107.097717

_Hypertension_ is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0194-911X. Online ISSN: 1524-4563

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World Wide Web at:
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