

## Balsamic Vinegar Improves High Fat-Induced Beta Cell Dysfunction via Beta Cell ABCA1 (*Diabetes Metab J* 2012;36:275-9)

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It is well known that lipotoxicity can cause  $\beta$ -cells injury and/or dysfunction as well as glucotoxicity [1-4]. If we could expect improvement of  $\beta$ -cell dysfunction by reducing glucotoxicity through glucose control, it could be very helpful for diabetes management to control lipotoxicity within pancreatic islets. Seok et al. showed the anti-diabetic effect of balsamic vinegar through improvement of  $\beta$ -cell function via increasing  $\beta$ -cell ATP-binding cassette transporter subfamily A member 1 (ABCA1) expression in Otsuka Long-Evans Tokushima Fatty (OLETF) rats fed a high-fat diet. Reducing glucose levels as measured by an oral glucose tolerance test can be associated with the improvement of  $\beta$ -cell function.

A reduction in  $\beta$ -cell mass can be a main cause for the development of type 2 diabetes [5,6]. Because, not only is there an increase in insulin resistance observed in OLETF rats with type 2 diabetes, there is also a severe  $\beta$ -cell deficit. It would be of interest to researchers and clinicians to observe changes in  $\beta$ -cell mass in OLETF rats fed with balsamic vinegar. In other words, there is a need to demonstrate whether balsamic vinegar increased insulin secretion from pancreatic  $\beta$ -cells or was there also an increase in  $\beta$ -cell mass. The authors showed that the insulin/islet area in pancreatic sections were stained with antibodies against insulin, however, the results would be stronger if the authors provided evidence showing the results of a  $\beta$ -cell mass analysis. In the study, fasting glucose and postprandial glucose levels decreased as measured by a glucose tolerance

test, but the authors could not give evidence for whether this change could be associated with insulin secretion at fasting or postprandial status or due to another mechanism such as an increase in glucose uptake through the improvement of peripheral insulin resistance. It is possible that  $\beta$ -cell dysfunction improved through a reduction in pancreatic cholesterol staining. It could give more evidence to show quantitative analysis for the pancreatic cholesterol.

Nevertheless, this study provides the meaningful conclusion that balsamic vinegar can improve lipotoxicity in pancreatic  $\beta$ -cells. In the future, how such a substance could suppress lipotoxicity in  $\beta$ -cells and how it could affect  $\beta$ -cell mass or dysfunction will need to be demonstrated and elucidated in greater detail.

### CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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