



The Use of Honey in Diabetes Mellitus: Is It Beneficial or Detrimental?

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Dear Editor,

Diabetes mellitus is a metabolic disorder that is characterized by chronic hyperglycemia, due to defects in insulin secretion and/or action activity (1). In the past decades, there has been a renewed interest in the use of natural products, including herbs and honey, in the treatment of diabetes. This commentary is written to allay fears that the use of honey is detrimental in diabetes. Recent findings indicate that honey improves glycemic control and exerts hypoglycemic effect in non-diabetic, alloxan- and streptozotocin-induced diabetic rats (2-5). The combination of antidiabetic drugs with honey further improves glycemic control in diabetic rats (6). In humans, honey supplementation reduces hyperglycemia (3, 7). Only one study suggests that the use of honey in diabetes is detrimental, observing that honey-supplemented diabetic patients had significantly increased glycosylated hemoglobin (8). In contrast, no such effect was observed in diabetic controls (8). The findings from this study seem to suggest that the use of honey worsens glycemic control

in diabetes. However, a closer examination of the study design and the honey that was used in the study indicates that such a conclusion is invalid. First, the honey-treated diabetic group received graded doses of honey orally for 8 weeks, starting from 1 g/kg/day for the first and second weeks, 1.5 g/kg/day for the third and fourth weeks, 2 g/kg/day for the fifth and sixth weeks, and 2.5 g/kg/day for the seventh and eighth weeks (8). Increasing the dose of any pharmacological agent, including honey, without proper therapeutic monitoring is inappropriate. Second, the majority of honey samples contain more fructose than glucose (or the same proportion) or fructose: glucose ratio ≥ 1.0 (6, 9). The honey used in the study had more glucose than fructose (fructose:glucose ratio, 0.46) (9), meaning that the amount of glucose in this honey was twice the amount of fructose. The reason for the unusually high glucose content in this honey remains unclear. Whether this honey was adulterated, in whatever form, without the authors' knowledge is another subject entirely (10).

This issue is significant due to its clinical implications in diabetic patients. Compelling evidence implicates the role of fructose in the hypoglycemic effect of honey (3). Therefore, administering honey that contains fructose levels that are twice as low compared with other honeys might not produce a similar effect as other honey varieties with high fructose contents. Further, administering

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a honey sample that is very high in glucose to diabetic patients for 8 weeks is likely to enhance glycation. This might explain the significantly increased concentrations of glycosylated hemoglobin in the honey-supplemented diabetic patients. This conclusion is supported by the finding that the diabetic control group that did not receive this honey did not experience a significant increase in the levels of glycosylated hemoglobin (8). Third, the dose of the honey was increased every 2 weeks. Increasing the dose of honey that is already high in glucose is not expected to improve glycemic control and can exacerbate glycemic control (10). Thus, it is not surprising that the diabetic patients who were administered this honey demonstrated deteriorating glycemic control (8). Based on these explanations and views, any conclusion that attributes worsening glycemic control to honey, based on the findings of this study (8), is invalid.

In conclusion, the explanations and evidence in this commentary indicate that the use of honey in the management of diabetes mellitus is not detrimental but beneficial, provided that genuine and natural honey is administered at appropriate therapeutic doses.

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The author declares that there are no conflicts of interest.

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