

## Patient Understanding of Hypoglycemia in Tertiary Referral Centers (*Diabetes Metab J* 2018;42:43-52)

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We appreciate Dr. Jeon's interest and comments on our article entitled "Patient understanding of hypoglycemia in tertiary referral centers" which was published in *Diabetes and Metabolism Journal* [1].

It is now well-known that achieving good glycemic control reduces risk of diabetic complications. However, hypoglycemia is a common adverse event of an intensive glucose control and has negative effects on various aspects; in severe cases, it is associated with increased risk of adverse clinical outcomes, including vascular events and death [2]. Even self-treated mild hypoglycemia can lead to lower quality of life, poorer adherence and worsening of the treatment outcome [3,4]. Thus, hypoglycemia prevention is an essential component of diabetes treatment, and it depends on individualizing glycemic goals, selecting the appropriate medication and providing education [5]. Although recent studies have emphasized the importance of structured, intensive education, only few surveys have examined patients' awareness about hypoglycemia. Therefore, we attempted to investigate the current status of hypoglycemia education and the knowledge of patients.

As mentioned in the letter, the results of our study clearly showed a lack of hypoglycemia education. Of the 758 participants, 62.1% have experienced hypoglycemia and 32.9% had hypoglycemic event in last month. However, only 31.9% answered that they had been educated about hypoglycemia. A study conducted at a tertiary care hospital in India was even worse, which showed that 90.8% of diabetic patients were not educated about the disease [6].

Most participants had insufficient knowledge of hypoglycemia. Although the answers to questions on hypoglycemic symptoms may be underestimated as Dr. Jeon pointed out, the overall rates of correct answers were also low in other questions. Moreover, the educated group did not give better answers to certain questions compared to uneducated group. In a survey of hypoglycemia conducted in Japan, about 43% of the patients had knowledge about symptoms of hypoglycemia, 25% of the patients were aware of the cause of hypoglycemia, but only 19% of patients knew when hypoglycemia would occur [7]. In this study, patient's perception seemed to be overestimated because it was investigated by self-assessed knowledge of hypoglycemia. In another study conducted in Germany, knowledge of hypoglycemia among caregivers of patients with type 2 diabetes mellitus was assessed. One-thirds of the participants never or seldom sought information about hypoglycemia, and only 10% answered that they could fully understand the information about hypoglycemia. One-quarter of the participants did not know any symptoms of hypoglycemia, and one-third did not know the correct treatment measures of hypoglycemia [8]. Based on these results, current patient education program for hypoglycemia is not sufficient to recognize and cope with hypoglycemia.

For proper hypoglycemia education, recording a detailed history of the cause, course, frequency of hypoglycemic event, and appropriate blood glucose monitoring should be performed beforehand. The next and the most important step is consultation between patients, caregivers and diabetes educa-

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tors (doctors, nurses, dietitians, and social workers) with wide experience in diabetes treatment and hypoglycemia [9]. We totally agree with Dr. Jeon's opinion that the patient education program should be systematically conducted on a team basis and under the support of the nation, not by individual physicians.

## CONFLICTS OF INTEREST

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

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