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Impaired Crosstalk Between Insulin and Glucagon Secretion in Patients With Type 2 Diabetes

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In this issue (P6), Morimitsu and Hamasaki report that once-weekly glucagon-like peptide-1 (GLP-1) receptor agonist, dulaglutide ameliorated glycemic control by suppressing fasting and postprandial glucagon secretion in a patient with type 2 diabetes [1]. Their report reminded me a significance of impaired crosstalk between insulin and glucagon secretion in patients with type 2 diabetes.

In normal individuals, serum glucagon falls after carbohydrate ingestion. In diabetic patients, serum glucagon is not suppressed by carbohydrate ingestion despite hyperglycemia [2]. An inverse relationship between insulin and glucagon secretion observed in normal individuals has been lost in patients with type 2 diabetes [3]. Such an impaired crosstalk between insulin and glucagon secretion was also observed in pre-diabetic individuals [4]. Postprandial hyperglucagonemia in type 2 diabetes is likely due to loss of intra-islet postprandial suppression of glucagon secretion by insulin [5]. Therefore, altered insulin-to-glucagon ratio which was used in the report by Morimitsu and Hamasaki should play an important role in the pathophysiology of type 2 diabetes [6].

GLP-1 receptor agonist improved glycemic control by amelioration of insulin-to-glucagon ratio. Effects of other anti-diabetic drugs on insulin-to-glucagon ratio should be studied in the future.

Conflict of Interest

The author declares that he has no conflict of interest concerning this article.

References

1. Morimitsu S, Hamasaki H. Improved glycemic control due to reduction in glucagon levels by the administration of once-weekly dulaglutide in a non-obese patient with type 2 diabetes. J Endocrinol Metab;2018;8(1):6-9.
2. Muller WA, Faloona GR, Aguilar-Parada E, Unger RH. Abnormal alpha-cell function in diabetes. Response to carbohydrate and protein ingestion. N Engl J Med. 1970;283(3):109-115.
3. Menge BA, Gruber L, Jorgensen SM, Deacon CF, Schmidt WE, Veldhuis JD, Holst JJ, et al. Loss of inverse relationship between pulsatile insulin and glucagon secretion in patients with type 2 diabetes. Diabetes. 2011;60(8):2160-2168.
4. Rohrer S, Menge BA, Gruber L, Deacon CF, Schmidt WE, Veldhuis JD, Holst JJ, et al. Impaired crosstalk between pulsatile insulin and glucagon secretion in prediabetic individuals. J Clin Endocrinol Metab. 2012;97(5):E791-795.
5. Meier JJ, Kjems LL, Veldhuis JD, Lefebvre P, Butler PC. Postprandial suppression of glucagon secretion depends on intact pulsatile insulin secretion: further evidence for the intraislet insulin hypothesis. Diabetes. 2006;55(4):1051-1056.
6. Jiang G, Zhang BB. Glucagon and regulation of glucose metabolism. Am J Physiol Endocrinol Metab. 2003;284(4):E671-678.

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