Response

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Features of Long-Standing Korean Type 2 Diabetes Mellitus Patients with Diabetic Retinopathy: A Study Based on Standardized Clinical Data (*Diabetes Metab J* 2017;41:393-404)

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We appreciate the interests and comments on our manuscript, "Features of long-standing Korean type 2 diabetes mellitus patients with diabetic retinopathy: a study based on standardized clinical data," which was published in *Diabetes & Metabolism Journal* (DMJ).

Diabetic retinopathy (DR) and macular edema (ME) are important diabetic microvascular complications that severely impair the quality of life of patients with type 2 diabetes mellitus (T2DM) through severe visual loss or blindness [1]. Several studies have shown that it is possible to improve the quality of life of patients and the clinical course of DR and ME through strict control of blood glucose and other related risk factors [2]. However, the screening rate for diabetic ophthalmopathy is not sufficient in many countries including Korea, and proper treatment and management are still unsatisfactory [1,3].

We have previous planned a study to understand the clinical characteristics of diabetic ophthalmopathy in Koreans. We recruited 183 T2DM patients with disease duration of 15 years or longer and compared their characteristics according to the presence or grade of DR and presence or absence of ME [4]. This approach not only identifies the risk factors for diabetic ophthalmopathy but also identifies the characteristics of the subjects who did not experience complications even after a long period of disease.

In our study, proliferative DR (PDR) subjects were significantly younger than non-DR subjects, while duration of disease was significantly longer [4]. These results show that diabetes mellitus (DM) patients at younger ages may be at a higher risk of developing future microvascular complications. Since the incidence of DM in young age is continually increasing in Korea, public health problems caused by DR are expected to become severer in the future [5]. In this study, we considered all parameters that were found to be significant among the baseline characteristics of the subjects, as well as those already known as risk factors for existing DR, as a confounder, when performing multivariate logistic regression analyses. Patients with acute illness that may affect the outcome at the time of the study or those who were difficult to observe over the long term were excluded from the study.

Second, in our study, the odds ratio (OR) of PDR to glycated hemoglobin was 0.998 (95% confidence interval, 0.682 to 1.462). We also agree that glycemic control is one of the most important modifiable factors for the prevention of DM ophthalmopathy. However, baseline fasting glucose and glycosylated hemoglobin did not reflect the long-term glycemic burden in T2DM patients who had a long duration of disease in our study.

Third, insulin is a growth factor that acts on the insulin-like

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growth factor 1 (IGF-1) receptor-mediated pathway and is known to be one of the potential risk factors of DR. In fact, the Diabetes Control and Complications Trial (DCCT) study showed increased risk of DR after about a year of intensive treatment with insulin [6]. Other studies have also shown a significant association between insulin use and increased risk of retinopathy [7]. Our study also showed similar results. In a previous study, it was reported that IGF-1 reduction through pituitary ablation can prevent retinopathy aggravation, suggesting the presence of causality [8]. However, since our research was conducted as a cross-sectional study, it is difficult to think that our research results are sufficiently high. As mentioned, it is difficult to rule out the possibility that the ORs for insulin may be high due to the effects of unadjusted factors. In the future, we will conduct a longer observation study based on the implications obtained from the present study. We will try to gather a higher level of evidence by referring to the research design that you sent us.

Thank you again for your letter.

CONFLICTS OF INTEREST

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

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