# Response

**DIABETES & METABOLISM JOURNAL**

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# Safety of COVID-19 Vaccines among Patients with Type 2 Diabetes Mellitus: Real-World Data Analysis (*Diabetes Metab J* 2023;47:356-65)

Hye Jun Kim[1], Sung Ryul Shim[2], Myunghee Hong[3,4], Hyun Wook Han[4]

[1]Department of Biomedical Sciences, Seoul National University College of Medicine, Seoul,
[2]Department of Biomedical Informatics, Konyang University College of Medicine, Daejeon,
[3]Division of Cardiology, Department of Internal Medicine, Yonsei University Health System, Seoul,
[4]Institute of Biomedical Informatics, CHA University School of Medicine, Seongnam, Korea

We appreciate the valuable insights provided by Dr. Ohn in response to our published study titled, "Safety of COVID-19 vaccines among patients with type 2 diabetes mellitus: real-world data analysis" [1]. We also extend our gratitude to the editor for allowing further discussion on our article.

First, we acknowledge the author's concern regarding the potential impact of diabetes as an independent risk factor for thrombotic complications, which could potentially lead to misinterpretation of our findings. We concur that our observed increase in the incidence of thrombotic adverse events could, to some extent, be attributed to the prothrombotic conditions often associated with diabetes [2,3]. Owing to the limitations inherent in the Vaccine Adverse Event Reporting System (VAERS) data, we acknowledge that we were unable to comprehensively account for these complex factors. This highlights the necessity for more nuanced investigations in future studies, where a more detailed examination of these variables could yield a more complete understanding of the observed outcomes.

Second, the purpose of propensity score matching (PSM) is to balance the covariate distribution between two groups. The PSM approach used in-caliper nearest-neighbor matching, with caliper values equal to 0.25 of the standard deviation of the PS logit. Additionally, we calculated standardized mean differences (SMDs) across groups to detect any remaining imbalance in the matched samples. Consequently, as presented in Table 1 of our paper [1], the SMD was <0.001, and a 1:3 PSM ratio was the optimal matching.

Last, we thank the author for identifying inaccuracies in certain expressions within our manuscript. As indicated, the sentence in the 'Results' section of the abstract was corrected to, "patients with type 2 diabetes mellitus (T2DM) vaccinated with BNT162b2 were more vulnerable to deep vein thrombosis and less likely to be associated with incident thrombocytopenia (TP) than were those vaccinated with JNJ-78436735." Similarly, the sentence in the first paragraph of the 'Discussion' section was corrected to, "TP was less common in patients vaccinated with mRNA-1273 than in those vaccinated with JNJ 78436735."

We want to reiterate our appreciation for the constructive feedback provided by Dr. Ohn. We believe further investigation is imperative and worthwhile to gain a deeper understanding of the severe adverse events associated with COVID-19 vaccinations among T2DM patients.

## CONFLICTS OF INTEREST

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

Corresponding authors: Hyun Wook Han https://orcid.org/0000-0002-6918-5694
Department of Biomedical Informatics, Graduate School of Medicine, CHA University,
335 Pangyo-ro, Bundang-gu, Seongnam 13488, Korea
E-mail: stepano7@gmail.com

Myunghee Hong https://orcid.org/0000-0002-4573-3625
Department of Biomedical Informatics, Graduate School of Medicine, CHA University,
335 Pangyo-ro, Bundang-gu, Seongnam 13488, Korea
E-mail: mhhong99486@gmail.com

## REFERENCES

1. Kim HJ, Lee SJ, Sa S, Bae JH, Song G, Lee CW, et al. Safety of COVID-19 vaccines among patients with type 2 diabetes mellitus: real-world data analysis. Diabetes Metab J 2023;47:356-65.

2. Olesen KKW, Madsen M, Gyldenkerne C, Thrane PG, Wurtz M, Thim T, et al. Diabetes mellitus is associated with increased risk of ischemic stroke in patients with and without coronary artery disease. Stroke 2019;50:3347-54.

3. Overvad TF, Skjoth F, Lip GY, Lane DA, Albertsen IE, Rasmussen LH, et al. Duration of diabetes mellitus and risk of thromboembolism and bleeding in atrial fibrillation: nationwide cohort study. Stroke 2015;46:2168-74.