

# Association between Cigarette Smoking and New-Onset Diabetes Mellitus in 78,212 Koreans Using Self-Reported Questionnaire and Urine Cotinine (*Diabetes Metab J* 2020;44:426-35)

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We would like to thank Professor Bo-Yeon Kim for her interest in our study and her valuable comments [1].

We agree with Professor Kim that a family history of type 2 diabetes mellitus (T2DM) is an important factor in T2DM development. While we did not include this information in our study, according to our data, 13.4% ( $n=10,456/78,212$ ) of our study population had a family history of T2DM. This value was approximately 2-fold higher in the new-onset diabetes mellitus (NODM) (+) group compared to the NODM (-) group (24.2% vs. 13.2%,  $P<0.001$ ). In our multivariate-adjusted Cox-hazard regression analysis, which included T2DM family history, the association between smoking status and NODM was similar to the main results of our study (relative risk [RR], 1.33; 95% confidence interval [CI], 1.07 to 1.65 for self-reported current smoking) (RR, 1.18; 95% CI, 0.94 to 1.48 for self-reported former smoking).

Second, we agree that weight gain after smoking cessation may have affected NODM prevalence in self-reported former smokers. The mean body weight difference during 27 months of follow-up in never, former and current self-reported smoking groups was  $0.6\pm 3.1$ ,  $0.3\pm 3.2$ , and  $0.8\pm 3.3$  kg. Unlike previous studies that observed weight gain in former smokers after smoking cessation, the difference in weight gain was minimal in our study's former smoking group. We adjusted for 'body weight change' variable in our multivariate analysis and

the key results were similar to our original findings (RR, 1.32; 95% CI, 1.06 to 1.64 for self-reported current smoking) (RR, 1.23; 95% CI, 0.98 to 1.55 for self-reported former smoking). We conducted subgroup analysis by classifying self-reported former smoking group into three subgroups depending on weight change:  $\geq -1$  kg weight reduction,  $-1\pm 2$  kg weight change and  $\geq 2$  kg weight gain. In this subgroup analysis, significantly increased risk of NODM was only observed in self-reported former smokers who gained more than 2 kg (RR, 1.00; 95% CI, 0.62 to 1.63;  $P=0.98$  for the  $\geq -1$  kg subgroup) (RR, 1.15; 95% CI, 0.82 to 1.64;  $P=0.42$  for the  $-1\pm 2$  kg subgroup) (RR, 1.10; 95% CI, 1.00 to 2.26;  $P=0.049$  for the  $\geq 2$  kg subgroup). Therefore, this finding could suggest that weight gain after smoking cessation does not increase risk of NODM.

Third, we agree with your comment that different studies have set different urinary cotinine cut-off values for distinguishing current smokers from non-smokers, and there is not yet an established cut-off value. We employed a urine cotinine cut-off level of  $\geq 50$  ng/mL based on the Society for Research on Nicotine and Tobacco (SRNT) recommendation published in 2002, which is one of the most widely used cut-off levels for distinguishing current from never smokers. [2] Also, our previous longitudinal study, which assessed 167,868 individuals using a cut-off level of 50 ng/mL, provided high sensitivity (84.8%) and specificity (98.2%) in differentiating current from

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never smokers. [3]

We are grateful for Professor Kim's valuable comments to our study.

### CONFLICTS OF INTEREST

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

### REFERENCES

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