Introduction: Body weight status and diabetes are associated with development of new-onset atrial fibrillation (AF). However, it is unclear whether there is any interaction between body weight and diabetes. Impact of impaired fasting glucose and duration of diabetes also remains unclear. We performed this study to evaluate the role of underweight (body mass index [BMI] < 18.5), overweight (25.0 ≤ BMI < 30.0), obesity (BMI ≥ 30.0), and various stage of diabetes on new-onset AF.

Methods: A total of 9,797,418 patients who underwent national health check-ups were analyzed.

Result: During 80,130,161 patient*years follow-up, a total of 196,136 new-onset AF occurred. Obese, overweight, and underweight patients showed significantly increased risk of new-onset AF compared to the normal reference group (18.5 ≤ BMI < 23.0) in both univariate and multivariate analysis. Diabetes was classified into 5 stages (non-diabetic, IFG, new-onset diabetes, diabetic for less than 5 years, and diabetic for more than 5 years) and gradual escalation in the risk of new-onset AF was observed along with advancing diabetic stage. Body weight and diabetes were independently associated with new-onset AF and at the same time, had synergistic effects on the risk of new-onset AF with obese diabetic patients having the highest risk.

Conclusion: Body weight status and diabetes were both independently associated with new-onset AF and had synergistic effects. The risk of new-onset AF increased gradually with advancing diabetic stage. This study suggests that maintaining optimal body weight and glucose homeostasis might prevent new-onset AF.