Introduction: Hypertension and obesity are known risk factors for atrial fibrillation (AF). However, it is unclear whether uncontrolled and long-standing hypertension has a more profound impact on AF. Due to their similar underlying pathophysiology, hypertension and obesity may act synergistically in the context of AF. We evaluated the impact of various stages of hypertension and body weight status on new-onset AF.

Methods: A total of 9,797,418 patients who underwent a national health check-up in 2009 were analysed. Hypertension was classified into five stages: non-hypertension, pre-hypertension, hypertension without medication, hypertension with medication <5 years, and hypertension with medication ≥5 years. The patients were also stratified based on body mass index (BMI) and waist circumference.

Result: During the 80,130,161 patient 10-year follow-up, a total of 196,136 new-onset AF occurred. The incidence of new-onset AF gradually increased among the five stages of hypertension: the adjusted hazard ratio for each group was 1 (reference), 1.145, 1.390, 1.853, and 2.344 for each stage of hypertension. A graded escalation in the risk of new-onset AF was observed in response to increased systolic and diastolic blood pressure. The incidence of new-onset AF was related to BMI and waist circumference, with obese patients having a higher risk. Hypertension and obesity acted synergistically; obese patients with hypertension on medication ≥5 years showed the highest risk.

Conclusion: The degree and duration of hypertension, as well as the presence of hypertension, were important determinants of new-onset AF. Body weight status was significantly associated with new-onset AF and acted synergistically with hypertension.