

Establishment of the diet-induced obese rat model for atrial fibrillation.

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Background: Obesity is a risk factor for atrial fibrillation (AF). However, the mechanisms underlying AF in obesity remain unclear. In this study, we established the diet-induced obese-rat model with high AF inducibility and evaluated the relationship between AF inducibility and cardiac function.

Methods: Male Sprague-Dawley rats were fed with normal chow diet + normal drinking water (NCD) or high-fat diet + 30% fructose in drinking water (HFFr) for 12 weeks. These rats were subjected to hemodynamic measurements, echocardiography to assess the evaluation of the cardiac structure and function., and transesophageal burst atrial pacing for the induction of AF.

Results: HFFr-fed rats were divided into 2 groups: obese and non-obese HFFr-fed rats. Compared with NCD-fed rats, the inducibility of AF significantly increased in obese HFFr-fed rats, but not in non-obese HFFr-fed rats. On echocardiography, LVEF (an indicator of LV systolic function), and E/A ratio (a marker of LV diastolic function) didn't change among these rats. For hemodynamic measurements, LVSP, dP/dtmax, and heart rate increased in obese HFFr-fed rats.

Conclusion: We established the obese rat model with high AF inducibility while maintaining normal cardiac function. This model would be useful to elucidate the mechanisms of obesity-related AF.