Atrial fibrillation (AF) is associated with an increased risk of cardiovascular morbidity and mortality, and the goals of AF therapy are relief of symptoms and improvement of survival rates. Randomized prospective clinical trials fail to show mortality benefit of maintaining sinus rhythm (SR) in AF patients, but patients maintaining SR have better QOL. Although the efficacy and safety of catheter ablation therapy have increased, a limited number of patients can be treated by this approach. Therefore, pharmacological agents remain the first-line therapy for the rhythm management of AF, although currently available anti-arrhythmic drugs are moderately successful in long-term maintenance of SR and are associated with an increased risk of ventricular proarrhythmia. The electrophysiological mechanisms underlying AF are complex, involving both reentry in atria and ectopic focal firing mainly in pulmonary vein myocardial sleeves. The latter can be attributable to early and delayed afterdepolarizations, and alterations in intracellular Ca\(^{2+}\) handling. In addition, structural remodeling, especially tissue fibrosis, is a significant contributor to the AF substrate. The renin-angiotensin-aldosterone system, oxidation stress and inflammation seem to be involved in structural remodeling. In this review, we overview current knowledge about AF pathogenesis and discuss appropriate approaches for pharmacological management of AF based on basic electrophysiological findings, including recent drug development focused on "atrial-selective ion channel blocking" and "multiple-channel blocking" profiles minimizing the risk of ventricular proarrhythmia.

Keywords: atrial fibrillation, anti-arrhythmics, electrophysiology