

# Gender is important in relation to thromboembolism in atrial fibrillation

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Atrial fibrillation is the most common heart rhythm condition, and gender is an independent risk factor for thromboembolism (especially stroke). The pathophysiological mechanisms responsible for this increased risk of thromboembolism in women are not well understood.

Christina L. Cove, MD, vascular medicine specialist and current fellow in cardiology at Boston University Medical Center, MA, U.S.A., and her team published a 'state of the art' review to explore potential underlying mechanisms for sex differences and to alert the public about the necessity of anticoagulant therapy in women. They noted that observational data suggest that these sex-based differences in stroke severity are not only related to differences in stroke risk factor profiling and management, but also to underutilization of anticoagulant therapy in women.

Based on Virchow's triad, thrombosis formation that leads to thromboembolism (especially stroke) in patients suffering from [atrial fibrillation](#) is based on three co-existing phenomena: structural abnormalities, blood stasis and a hypercoagulable state. In other words, clot formation occurs under conditions of altered blood flow, blood vessel abnormalities and hypercoagulability. The higher risk of thromboembolism among women with atrial fibrillation compared to men suggests that sex-related differences exist in the vasculature and structure of the heart muscle. These differences may predispose women to alterations in blood flow, shear stress, and altered endothelial function. There may also be a potential sex-based increase, especially in

the post-menopausal state, in systemic inflammatory and procoagulant markers, thrombogenic particles and platelet aggregation, all of which contribute to a prothrombotic milieu.

There are obvious deleterious changes following menopause, highlighting the need to specifically address the aging female population 65 years and older. Protective effects of endogenous estrogens may be lost after menopause, even if women are on hormone replacement therapy. The combined consequence of these changes in cardiac and vasculature structure, along with loss of natural hormonal protection, might explain the increased risk of thromboembolism in women with atrial fibrillation.

Therefore, the authors suggest that healthcare providers aggressively treat such modifiable risk factors for thromboembolism and stroke as diabetes and hypertension in this higher-risk patient population. Gender is particularly important, especially in association with one or more such risk factors.

"Now that we know female patients carry an innately higher risk for [thromboembolism](#) especially stroke, oral [anticoagulant therapy](#) should be considered in these patients by health care providers, taking into account risks and benefits of various treatment options," Cove said. Future challenges in research might help to identify strategic targets amenable to intervention. In the meantime, however, there is an increased need for [stroke](#) prevention therapy and risk-factor reduction in [women](#) with atrial fibrillation.

**More information:** Cove CL, Albert CM, Andreotti F, et al. "Female Sex as an Independent Risk Factor for Stroke in Atrial Fibrillation: Possible Mechanisms." *Thromb Haemost* 2014; 111: 385-391

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