Tumor Necrosis Factor- α , a Good Biomarker and Novel Potential Therapeutic Target for Atrial Fibrosis

To the Editor:

Tumor necrosis factor- α (TNF- α) plays an important role in atrial fibrillation (AF). A recent article by Liew et al demonstrated that TNF- α is involved in the pathogenesis of atrial fibrosis and altered connexin-40 expression in mice through the TGF- β 1 signaling pathway.¹ Their findings suggest that TNF- α may contribute to atrial fibrosis and the development of AF.

Much research has been done on this topic. Thandavarayan et al also demonstrated that TNF- α was markedly increased in cardiac fibrosis.² What's more, atrial fibrosis increased in response to ventricular tachypacing. Kitamura et al found that treatment with eicosapentaenoic acid attenuated atrial fibrosis and decreased TNF- α expression.³ Furthermore, Aljabri et al shown that pregnancy reduced the expression of TNF- α , and seemed to counteract the detrimental effects of angiotensin II on fibrosis in the rat heart.⁴ Pandey et al indicated that the expression of both angiotensin II AT(1a) receptors and TNF- α was markedly increased in hearts from Npr1-null mutant mice,⁵ which promotes the development of cardiac hypertrophy and remodeling. Qu et al⁶ demonstrated that patients with valvular disease and AF exhibited higher NF- κ B activity, higher concentrations of TNF- α , severe lymphomonocytic infiltration, and more fibrosis than those patients with valvular disease in sinus rhythm. There were significant positive correlations between atrial fibrosis and the level of TNF- α . Compared with vehicle, a sub-hypotensive dose of moxonidine resulted in lower heart rate, less left ventricular hypertrophy, smaller cardiomyocyte cross-sectional area, and decreased TNF- α .⁷

Taken together, these findings suggest that TNF- α may be a good clinical biomarker of atrial fibrosis and AF, and a potential therapeutic target in such cases. Therapeutic agents targeting TNF- α might result in innovative new therapies for atrial fibrosis. We greatly enjoyed reading the article by Liew et al

and believe TNF- α may be useful for preventing and treating atrial fibrosis.

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