Frequency of Mitochondrial DNA 4977 Deletion Mutation and Their Clinical Characteristics in Patients with Atrial Fibrillation

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Backgrounds: It has been reported that somatic mutations of mitochondrial DNA (mtDNA) is related with aging, or development of cardiovascular disease. We hypothesized that mtDNA4977 deletion mutation (4977-) detected from human blood contributes to atrial dysfunction in patients with AF. Methods: We studied for mtDNA4977- in 183 patients with non-valvular AF, (127 PAF, 56 PeAF) and 69 patients with healthy control. The detection of mtDNA4977- was determined by Gene Scan. Results: 1. The mtDNA4977- in AF patients were older than those without mutation (61.4±9.2 vs. 51.8±9.9, p<0.0001). 2. Frequency of mtDNA4977- mutation in patients with AF ≤45 years old was not different to age matched control (7.3% vs. 11.6%, p=0.2371). 3. The mtDNA4977- had higher E/E', (11.3±4.8 vs. 9.1±3.1, p=0.0005), plasma levels of TIMP-1 (1.51±0.77 vs. 1.28±0.57 ng/mL, p=0.0210) and ANP (3.11±2.67 vs. 1.91±2.01 nmole/L, p=0.0010), and were more frequently taking statin (27.2% vs. 22.4%, p=0.0055) than those without mutation. 4. 82.3% with mtDNA4977- and 85.5% without mtDNA4977- remain in sinus rhythm 12.7±5.9 months after RFCA (p=0.3008). Conclusion: mtDNA4977- was related with aging, diastolic dysfunction, serologic markers related with atrial remodeling or pressure overloading. Its frequency was not different to age matched patients with control, and did not affect the clinical outcome after RFCA. Keywords: atrial fibrillation, mitochondrial DNA mutation