

Mitochondrial heteroplasmy in Kazakh subjects with subclinical atherosclerosis

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Abstract

The search of mitochondrial genome mutations related to atherosclerosis is necessary to determine the role of mitochondrial heteroplasmy in atherogenesis. Previously we have developed a quantitative assay of the mitochondrial DNA (mtDNA) mutations that allowed determining several variants of mitochondrial heteroplasmy associated with atherosclerotic lesions in aortal intima and carotid intima-media thickness (cIMT) in Russian 5sxz[=cardiovascular disease aged 50-70 years old were included in the study. Phenol-chloroform extraction was used to isolate mtDNA from blood leukocytes. Mitochondrial mutations were determined by pyrosequencing of mtDNA PCR-amplificated fragments. cIMT was measured by specialized M'Ath software in B-mode ultrasound freezed images of carotid arteries. Statistical analysis was performed by SPSS ver.20.0.

Results: The mean age of study participants was 62.0(4.5) years old, the mean cIMT – 0.806(0.097) mm. The following levels of estimated variants of mitochondrial heteroplasmy were determined: m.13513G>A – 11.7(6.4)%; m.12315G>A – 9.3(6.2)%; m.5178C>A – 22.5(8.2)%; m.14459G>A – 13.2(11.2)%; m.14846G>A – 18.9(4.9)%. It was found that mtDNA mutation m.13513G>A correlated negatively with cIMT in total group ($r=-0.526$, $p=0.036$), m.12315G>A correlated positively with cIMT in female group ($r=0.696$, $p=0.025$).

Conclusions: Thus, atherosclerosis-related variants of mitochondrial heteroplasmy were found in subjects from Kazakh population, however, further search in larger cohorts of genetically diverse populations is needed to estimate the contribution of mtDNA mutations in atherosclerosis development. This work was supported by the Russian Science Foundation (Grant #19-15-00297).

Biography

Tatiana V. Kirichenko has completed her PhD at the age of 30 years from Research Institute of General Pathology and Pathophysiology, Moscow, Russia. She is the senior researcher of Research Institute of Human Morphology and National Medical Research Center of Cardiology, Moscow, Russia. She has over 20 publications that have been cited over 200 times, and her publication H-index is 7.

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