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Thoracic aortic aneurysm and age-related vascular remodeling: Study of epigenetic mechanisms

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The key players in age-related vascular remodeling are vascular smooth muscle cells (VSMCs). Senescent VSMCs are phenotypically shifted from contractile into the secretory phenotype. Same phenomenon occurs during morphogenesis of dilatative pathology of ascending aorta. We tested if miR-21-5p, miR-143-3p, and miR-145-3p expression levels are similar during formation of thoracic aortic aneurysm (TAA) and in aging aorta. Expression of miRNAs was evaluated in aortic tissue specimens from TAA patients (N=8), donors and coronary artery bypass surgery (CABG) patients younger than 55 years (N=7), and CABG patients older than 70 years (N=8) using qRT-PCR. ΔCt values for each miRNA were calculated using miR-16-5p and miR423-5p as reference. A significant increase in miR-21-5p expression was found in TAA patients compared to younger individuals (p=0.04). Even a stronger difference was observed when young individuals were compared with older individuals (p=0.03). There was no significant difference in miR-21-5p expression between TAA patients and older individuals (p=0.05). These results show that similar miR-21-5p expression profiles can be identified in dilated and aging aortic tissue. A strong association was found between aortic diameters of TAA patients with bicuspid aortic valve (BAV) and miR-21-5p expression (r= 0.821, p=0.02). Same tendency was observed between age and miR-21-5p expression in individuals without TAA (r= 0.576, p=0.02). We did not find a significant difference in miR-143-3p and miR-145-3p expression among the three study groups (p>0.05). Our results show that epigenetic mechanisms involved in age related vascular remodeling are similar to the pathological processes which occur during formation of TAA.

Biography

Vaiva Patamsyte pursued her BSc in Genetics and MRes Biosciences from Cardiff University, UK and is currently a PhD student at the Lithuanian University of Health Sciences, Lithuania. She has been working in the Laboratory of Molecular Cardiology for the last four years. Her research focuses on genetic and epigenetic regulation of vascular remodeling.

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