The Effect of Estrogen on Cardiac Arrhythmic Propensity

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BMI Classroom 4004
Woodruff Memorial Research Building

or

Join us on Zoom link:
https://zoom.us/j/96700514341

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Abstract: Female sex is an independent risk factor for the development of life-threatening torsade de pointes (TdP) arrhythmias in congenital long QT (LQT) syndrome, the most common and often fatal channelopathy, characterized by a pro-arrhythmic prolonged QT interval. Interestingly, for women with congenital LQT, pregnancy facilitates a unique period of anti-arrhythmic protection of maternal life. Surprisingly, pregnancy is associated with a high level of estrogen. Although estrogen is known to further prolong the QT interval, and therefore would be anticipated to dangerously worsen the LQT phenotype in a pro-arrhythmic manner, on the contrary the hyperestrogenic state during pregnancy has been suggested by multiple clinical studies to be of anti-arrhythmic protective potential. Deciphering and understanding the anti-arrhythmic contribution of estrogen to LQT patients at time of pregnancy, in native human cardiac tissue, can lead to the identification of much needed new therapeutic targets and the design of novel therapeutic entities for the treatment of both female and male LQT patients, specifically, and arrhythmia-susceptible congenital disease patients, in general.

Bio: Dr. Itzhaki is a stem cell translational cardiac electrophysiology researcher. She is an Assistant Professor in the Department of Pediatrics at the Emory School of Medicine and Program Faculty at The Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University. Dr. Itzhaki received her Ph.D. from the Rappaport Faculty of Medicine at the Technion – Israel Institute of Technology. Her research focused on demonstrating the ability of disease- and patient-specific iPSC technology to model the phenotype presented by long QT syndrome and CPVT patients at the bedside as measurable electrophysiological and calcium signaling signatures at the cellular level in the dish at benchside, highlighting the potential of human iPSCs in the fields of translational research and precision medicine.

During her postdoctoral fellowship at Stanford University, leveraging her iPSC technology, electrophysiology, and calcium imaging expertise, she turned to the field of sex differences and sex hormones. Today, her team at Emory focuses on the study of age- and sex-related differences in cardiovascular health and disease, with a focus on the impact of sex hormones on mechanisms that contribute to the initiation and termination of cardiac arrhythmias, using the disease- and patient-specific induced pluripotent stem cell (iPSC) platform.