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Remote preconditioning and cardiac protection against ischemic injury induced by neutrophils

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Currently, remote ischemic preconditioning (RIPC) was introduced as a novel strategy of protection against ischemia-reperfusion (IR) injury in the heart (and/or other organs) by brief episodes of non-lethal IR in a distant organ/tissue. However, the underlying mechanisms of how ischemia of any organ (e.g., brain) can induce protection in another one (e.g., heart) is not entirely clear. This study involved a strategy to provide a clear picture about such phenomena that will be helpful at least in part in our battle against IR injury in the heart. The objective of this study was set to investigate neutrophils as potential therapeutic targets in IR injury in the heart. Neutrophils are the main source for ROS cause irreversible damaging effects which are amplified upon reperfusion. Previously published studies have demonstrated ischemia promotes neutrophils migration by a process called chemotaxis within 2-3 hours of its induction. That requires the temporal and spatial regulation of intracellular signaling pathways allowing the neutrophils to detect a gradient of attractant, polarize and migrate rapidly toward the highest concentration of the chemoattractant. There are three major theories of signal transduction from the remote organ to a target one: Neural pathway, humoral and systemic responses. Data obtained from this study provides insight as to how RIPC could prevent ischemia-reperfusion (IR) injury in the heart through brief episodes of non-lethal IR in a distant organ e.g., kidney. Further, the study explores how the density of neutrophils could amplify tissue damage upon reperfusion in the primary site of ischemia rather the second site. Identification of the underling mechanisms for the latter could provide us with vital information for neutrophils as a potential therapeutic target, which could reduce the infarct size and improved cardiac function. That also could provide a significant input in creation of new effective anti-ischemic drugs

Biography

Karolin Kamel Abdul-Aziz has completed her PhD from Alexandria University, Alexandria, Egypt and Harvard University, USA. She is currently the Dean of the Faculty of Science at Damanhour University, Egypt

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