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Sex differences during myocardial infarction: Role of autophagy

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Abstract

Ischemic heart disease continues to be the leading cause of mortality, morbidity and burden of disease, with gender differences reported in presentation and clinical outcomes; the incidence in men is almost twice that in women, although more women than men die suddenly without any previous symptoms. There is increased interest in defining the mechanisms for the sex related differences in cardiac damage following myocardial infarction, however, conflicting reports continue. We examined the role of androgens and estrogens during myocardial infarction (MI) in male and female animals, and how autophagy may contribute to the sex differences in cardiac damage. Mature age-matched male and female Sprague Dawley rats were used intact or surgically gonadectomized. Animals were anesthetised and hearts isolated and subjected to regional ischemia-reperfusion (I-R). In males, regional myocardial I-R in hearts from intact male rats produced significantly larger infarct size than those from female rats. Aggravated reperfusion injury correlated with increased apoptosis in the area at risk, Consistent with the smaller infarct size in female hearts there was significantly less apoptosis. Although gender differences have been reported for regulation of autophagy in cell based systems, to our knowledge, there have been no prior studies that examine whether sex steroids regulate autophagy during myocardial I-R. We found autophagy markers during myocardial I-R were similarly increased in both males and females, similar to previous reports in male animals. Studies in the gonadectomized (Gx) animals are currently in progress.

Biography

Anastasia Susie Mihailidou is a cardiovascular clinical scientist, graduating with a PhD in Pharmacology from University of Sydney in 1988. She is currently Clinical Senior Lecturer for Sydney Medical School, University of Sydney and Senior Hospital Scientist at Royal North Shore Hospital. Anastasia has both clinical and basic research interests as Director of the Ambulatory Blood Pressure Monitoring Service for a major Tertiary Referral Centre and Head of the Cardiovascular & Hormonal Research Laboratory. Her research focus is regulation of aldosterone/mineralocorticoid receptors in the heart and has made a significant contribution to understanding the role of corticosteroid hormones (and antagonists). She was the first to show aldosterone has both rapid and sustained effects on regulation of sodium transport in the heart, with increased levels of intracellular sodium. These findings have generated great interest, leading to award of the *Pfizer Prize for Best Research* at the International Society of Hypertension (2002). Her current research focus is to determine the role of aldosterone and mineralocorticoid receptors in diabetes.