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Editorial Open Access

Potential Cardioprotective Effects of Orlistat for Treatment of Myocardial Infarction

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Editorial

Acute myocardial infarction (AMI) is characterized by ischemic lesions that severely compromise cardiac structure and function, and even the survival of mammals. The ischemic cardiac diseases (ICD) are related to million deaths per year in the world [1,2]. Although convencional therapy is based on the cardiac reperfusion (R), this procedure increases cardiac damage caused by ischemia (I), and severe arrhythmias (e.g. ventricular arrhythmias and atrio-ventricular blockade) [2-5]. Several reports have demonstrated that cardiac arrhythmias caused by myocardial ischemia and reperfusion (I/R) could be originated from bioenergetic, and electrochemical, imbalance triggered mainly by decrease of ATP synthesis by mitochondria, and cytosolic Ca^{2+} overload in cardiomyocytes [2-5]. This Ca^{2+} overload is massively worsed by the increase of Ca^{2+} influx through L-type voltage-activated Ca^{2+} channels (VACC) caused by continuous membrane depolarization of cardiomyocytes during cardiac I/R [2-5]. In addition, cytosolic Ca^{2+} overload promotes accumulated Ca^{2+} in the mitochondrial matrix via increase of Ca^{2+} influx through mitochondrial uniporter, leading to mitochondrial bioenergetic collapse, and excessive production of free radical, which compromises the structure and function of mitochondria, and other cytoplasmic organelles [2-5]. These cellular mechanisms importantly contribute for developing arrhythmias, and death in AMI patients. Despite continuous advances in AMI treatment, a high ratio of patients dies suddenly in the early hours before arriving at the hospital [6-9]. Most of these early deaths are due to complex ventricular arrhythmias (VA) and atrio-ventricular blockade (AVB) [6-9]. Surprisingly, there is still lack of knowledge about the exact events of these early malignant arrhythmias, and their cellular and molecular mechanisms. Due to involvement of intracellular Ca^{2+} overload in cardiac arrhythmias caused by myocardial I/R, the use of pharmaceuticals that reduce this Ca2+ overload represents an alternative pharmacological approach to the treatment of ischemic cardiac diseases in humans, including AMI. Nonetheless, the cardiac reperfusion (R) continues to be the therapy more used to treat ICD [6-9]. Among the various risk factors for persuing cardiac I/R, we can highlight obesity; this disease has worldwide importance, and it is intrinsically related to cardiovascular diseases (e.g. atherosclerosis and thrombosis). Therefore, there is an incessant and required worldwide research for drugs that effectively act in the treatment of obesity. This is a metabolic disease that arises from biochemical, hormonal and energetic disorders [10,11]. Several drugs are used for the pharmacotherapy of obesity-FDA approved pharmacological monotherapy options-including orlistat (ORL, pancreatic lipase inhibitor) [12,13]. Therefore, our group decided to evaluate potential cardioprotective effects of the agents used in the pharmacotherapy (such as ORL) of dyslipidemia in normotensive rats-treated with ORL for ten days-and submitted to the model of in vivo cardiac I/R developed by our group [14]. The cardioprotection was analyzed by evaluation of the electrophysiological parameters through the electrocardiogram analysis (arrhythmias), and serum concentration biochemical markers of cardiac lesion produced in response to the cardiac I/R protocol (creatine kinase (CK)), low-density lipoprotein cholesterol (LDL-C) and lethality. We observed that the treatment with ORL could decrease the lethality, the serum levels of CK and LDL-C compared to control groups, indicating cardioprotective effects of the ORL. These results suggest that ORL produced cardioprotective effects against cardiac damage caused by cardiac I/R.

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