INTRODUCTION AND OBJECTIVES: Ischemia is responsible for several heart injuries, leading to functional disorders and high mortality in animals. Therefore, many studies have relied on kinases to understand how this process is regulated. Numerous cardioprotective agents converge to glycogen synthase kinase 3β (GSK3β) regulation, suggesting this enzyme as a therapeutic target to minimize the consequences of heart ischemia. This enzyme is a kinase usually involved in cardioprotection, as well as several other biological processes. Due to its involvement on cardiac system protection, the aim of this work is to study GSK3β and understand its role in energy metabolism during ischemia and reperfusion events. MATERIALS AND METHODS: Adult rabbits (Oryctolagus cuniculus) were distributed in 3 experimental groups: control (not ischemic), ischemic (ischemia performed through Inflow Occlusion), and reperfusion (blood circulatory recovery). The Inflow Occlusion (IO) and reperfusion were determined in 5 minutes. Sham animals were subjected to identical surgical procedures, without IO. GSK3β relative transcription analysis was performed by real time qRT-PCR, enzyme activity was analyzed by Western Blot, and glycogen content was determined enzymatically. RESULTS: GSK3β transcription increased during ischemia, followed by a decrease in glycogen content, suggesting that the consumption of this substrate during ischemia is mediated by GSK3β. Lactate level is highest in ischemia, and blood pH value decreased during the same period. During reperfusion, glycogen level returned to values similar to those observed in control condition, and accompanied by reduced GSK3β transcription. The results suggest GSK3β as a middle of glucose metabolism, leading to metabolic adaptations in ischemia and reperfusion injuries. CONCLUSION: The results show that GSK3β is correlated with cardiac metabolic adaptations at the onset of ischemia and reperfusion injuries, sustaining glucose anaerobic metabolism through the modulation of glycogen reserves.

KEYWORDS: Glycogen synthase kinase 3, ischemia, myocardium.

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