EVALUATION OF THE PROTECTIVE EFFECT OF NARINGENIN IN A MODEL OF CARDIOTOXICITY INDUCED BY THE ADMINISTRATION OF DOXORUBICIN IN HYPERTENSIVE RATS

Anelize Dada[1]*, Rita de Cássia Melo Vilhena de Andrade Fonseca da Silva[1], Mariana Zanovello[1], Anelise Felicio Macarini[1], Jeniffer Cristóvão Moser[1], Emmanuel Alvarenga Panizzi[1], Luciane Gobbo Brandão[1], Thaise Boeing[1], Valdir Cechinel Filho[1], Priscila de Souza[1].

[1]*Universidade do Vale do Itajaí, Brasil.* *anelizedada.pos@gmail.com

INTRODUCTION

Cardiovascular diseases (CVD) remain the leading cause of death in Brazil and worldwide, with ischemic diseases and stroke being particularly prominent. Systemic arterial hypertension (SAH) is a major risk factor, associated with acute myocardial infarction (AMI) and heart failure. Flavonoids, such as naringenin found in citrus fruits, have cardioprotective effects, potentially minimizing cardiotoxicity caused by chemotherapy treatments and offering new therapeutic strategies for heart diseases.

MATERIAL AND METHODS

The treatment with naringenin (NAR; 100 mg/kg) was administered orally for 15 days to normotensive (NTR) and hypertensive (SHR) rats, while cardiotoxicity was induced by doxorubicin (DOX), which was divided into six doses of 2.5 mg/kg, administered on alternating days over a two-week period via intraperitoneal injection. Blood pressure was measured before the start of treatment and every two days throughout the treatment period. At the end of the experiment, the aorta and cardiac tissue was collected, as well as blood for biochemical analysis. All methodologies and procedures were approved by the Animal Experimentation Ethics Committee of UNIVALI (protocol numbers 005/23 and 011/24).

RESULTS

There were differences in systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) between the NTR and SHR vehicle-treated groups. The DOX and NAR+DOX groups showed a reduction in blood pressure compared to the vehicle group, while NAR partially prevented DOX-induced decrease in SBP. The vehicle SHR group exhibited an increase in heart and aortic weight compared to the NTR, while NAR significantly reduced aortic weight. The liver in the SHR group was heavier than in the NTR group, with no significant differences observed in the kidneys. NAR reduced clot weight in the NAR+DOX group compared to the DOX group. No differences were found in lactate levels, but LDH and CK-MB were lower in the DOX and NAR groups compared to vehicle. NAR reduced the levels of lipoperoxides and restored reduced glutathione in the NAR+DOX group. KCl-induced contraction remained unchanged, but the SHR group had a reduced response to phenylephrine compared to NTR.

CONCLUSIONS

The results suggest that naringenin has cardioprotective effects, reducing blood pressure, attenuating cardiac and vascular damage, and improving biomarkers of oxidative stress and inflammation in cardiotoxicity models.

ACKNOWLEDGMENTS

Universidade do Vale do Itajaí. Fapesc. CAPES. CNPq.