Effects of physical exercise on the histopathological and oxidative stress parameters in the myocardial tissue of mice exposed to smoke straw cigarette.

Pereira, F.T\textsuperscript{1}, Dal'Maso, F\textsuperscript{1}; Pozzi, B.G\textsuperscript{1}; Paganini, C.S\textsuperscript{1}; Pedroso, G.S\textsuperscript{1}; Santos, M.F\textsuperscript{1}; Brescianini, S.M.S\textsuperscript{1}; Nesi, R.T\textsuperscript{1}; Silveira, P.C.L\textsuperscript{1}; Pinho, R.A\textsuperscript{1}.

Laboratory of Physiology and Biochemistry of Exercise, UNESC, Criciuma, Brazil

Background: It is well known that industrial cigarette smoke promotes an exacerbated inflammatory response with involvement of the airways, parenchyma, and pulmonary vasculature and also the cardiovascular system commitment. In addition to the industrial cigarette damage, the straw cigarette has also high consumption in Brazilian culture especially in rural area; however, the effect of smoke straw cigarettes is still unclear. The present study aimed to evaluate the effect of physical exercise on the histology and oxidative stress parameters on the myocardial tissue of mice chronically exposed to smoke straw and industrial cigarettes. Methods: It was used 54 Swiss mice (60 days of age, 30-55g), exposed to smoke cigarettes (industrial and straw). A total of 12 cigarettes were administrated 3 times a day with 4 cigarettes for each time, during 60 consecutive days and together with the smoke exposure, the animals were submitted to exercise protocols every 48hours of a day of smoke during 8 weeks. 48 hours after the last training, the heart was surgically removed in order to evaluated histology and oxidative stress parameters. Results: The results showed that both cigarette smoke (industrial and straw) contributed to morphologic damage in the muscle fiber and the nucleus not well defined compared to the control. The exercise attenuated the muscle fiber damage and contributed to the tissue repair. It was also observed an increase of oxidants (DCFH, NO) and oxidative modification (carbonil, sulfhydryl) after exposure compared to the control. The exercise attenuated this oxidative profile and also increased the antioxidant activities (SOD, Gpx and GSH). Conclusion: Taken together it was possible to note that the different types of cigarette promoted structural damage in the myocardial tissue and high levels of oxidative stress, contributing to the cardiovascular damage which are regulated by physical training.

Key words: cigarette smoke; exercise; straw cigarette; lung damage and histology.