Pancreas b-cells morphology, liver antioxidant enzymes and liver oxidative parameters in alloxan-resistant and alloxan-susceptible Wistar rats: a viable model system for the study of concepts into reactive oxygen species

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The aim of this study was to investigate biochemical and antioxidant parameters in alloxan-resistant (ALR) and alloxan-susceptible (ALS) rats. Diabetes was induced in 60-day-old male Wistar rats by a single intraperitonial injection of alloxan (AL, 150 mg/kg). Ten days after induction, a group of rats showed a significant decrease in glycemia. This group was named alloxan-resistant group. Susceptible rats showed a remarkable increase in the plasma lipid content, blood glucose and HbA1. Glycogen content in the liver decreased significantly in the ALS group (2.08±0.41 mg%) compared with ALR group (4.22±0.18). Aspartate aminotransferase and alanine aminotransferase activities were quantified in the plasma. Interestingly, ALR rats showed a decrease in both activities (42.1±6.11 and 21.7±5.54 U/mL) when compared with ALS rats (59.1±6.55 and 58.1±7.28 U/mL). The TBARS index was significantly increased in the ALS liver (0.38±0.08 nM/mg protein) when compared with the ALR liver (0.18±0.04). Superoxide dismutase and catalase activities in the ALR (230±13 and 131±15 U/mg protein) liver showed a marked increase when compared with the ALS liver (148±13 and 68±5 U/mg protein). The immunohistochemical and hematoxilin–eosin analysis also revealed that pancreatic islets of ALR rats display a different morphology amongst the groups. These results suggest an increased regenerative or recovery process in the ALR rat pancreatic islets and an increased hepatic antioxidant defenses in these group of alloxan-resistant rats. Financial support: CNPq, FAPERGS and Propesq/UFRGS.