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STATIN PRETREATMENT PROTECT AGAINST CEREBRAL DAMAGE FOLLOWING EXPOSURE TO HEATSTROKE IN DIABETIC RATS.

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BACKGROUND/AIMS Experiments were carried out to ascertain the protective effects of statin pretreatment against heatstroke-induced cerebral injury in diabetic rats. We validated the hypothesis that statin and heat shock protein (HSP) may confer cerebral protection against heatstroke-induced circulatory shock.

METHODS To deal with the matter, we assessed the effects of heatstroke on mean arterial pressure(mSAP), heart rate(HR), cardiac output(CO), local blood flow(BF), total peripheral vascular resistance(TPR), colonic temperature, blood gases, and serum levels of leptin and tumor necrosis factor-alpha (TNF-) in urethane-anesthetized rats pretreated without and with statin (Atovastatin) for 4 wks. Heatstroke was induced by exposing the animals to a high blanket temperature.

RESULTS/CONCLUSION mSAP , BF, blood pH, onset time of heatstroke and survival time after heat stress were all lower in diabetic rats. However, blood lactate concentrations, TPR, levels of leptin and TNF- were greater in diabetic rats exposed to heat stress. Diabetic rats pretreated with Atovastatin , when exposed to the same heat stress had longer onset and survival time, longer latency time for cardiac arrhythmia, lower TNF- level in Atovastatin pretreated diabetic rats. Western blot assay revealed heat stress induced HSP and neuronal injury markers expression in the brain. After the onset of heatstroke, HSP and neuronal injury markers in the cerebrum were found to be significantly higher and lower, in Atovastatin pretreated diabetic rats and diabetic rats not pretreated respectively. Previous statin treatment for 4 weeks conferred significant neuronal protection against cerebral hypoperfusion during heatstroke and correlated with expression of HSP in cerebrum and serum leptin levels. Thus, it appears that the observed benefit of statin is related to attenuation of tissue hypoperfusion and elevations of serum leptin level and HSP expression in the cerebrum during heatstroke-induced circulatory shock in diabetic rats.

Keywords: Statin. Atovastatin. Stress Protein.