Neuroprotective Effects of Atorvastatin in Mice Hippocampal Slices Submitted to Oxygen-Glucose Deprivation.

Vandresen-Filho, S.[1], Martins, W.C. [1],Herculano, B.A, [1]Tasca, C.I.
(1) Departamento de Bioquímica, Universidade Federal de Santa Catarina, SC.

Objectives: The aim of this study was to investigate if atorvastatin, a cholesterol-lowering agent by inhibition of 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase, treatment would have protective effects in hipocampal slices submitted to oxygen-glucose deprivation (OGD), an *in vitro* model of ischemia. **Methods**: Male adult Swiss albino mice (30–50 g, 2-3 months old) were pretreated with Atorvastatin 10 mg/kg/day, orally, or vehicle (saline, 0.9%) for seven days. In the eighth day, mice were killed by decapitation and hippocampi rapidly dissected and placed in ice-cold Krebs–Ringer bicarbonate buffer (KRB). In order to obtain the *in vitro* model of ischemia, hippocampal slices were incubated for 15 min in an ischemic buffer (IB), where D-glucose was replaced by 2-deoxy-glucose and gassed with nitrogen, followed or not by 2h of reperfusion in KRB. Cellular viability assay were performed by the 3-4,5-dimethylthiazol-2-yl-diphenyltetrazolium bromide (MTT) assay. **Results**: The MTT assay revealed that 15 min OGD and OGD plus reperfusion decreased cell viability in 55.8% and 69.6% in comparison to control, respectively. Atorvastatin *in vivo* pretreatment has no effects against cell viability diminishment induced by 15 min of OGD only (62.2%). However, atorvastatin pretreatment promoted increased cell viability during 2h of reperfusion after OGD (85%). **Conclusions**: These results show that atorvastatin can prevent OGD induced cell death during reperfusion. Thus, atorvastatin might be a useful strategy in the prevention of brain injury caused by cerebral vascular disorders, such as ischemia.

Keywords: Atorvastatin; neuroprotection; oxygen-glucose deprivation