Early-onset tolerance in rat global cerebral ischemia induced by a mitochondrial inhibitor.

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was studied whether a subtoxic dose of the mitochondrial neurotoxin, 3-nitropropionic acid (3-NPA), can initiate early-onset tolerance induction for subsequent ischemic injury. Wistar rats were pretreated for 3 h by intraperitoneal 3-NPA (20 mg/kg body weight; n=13) or solvent (n=12). Fifteen minutes global cerebral ischemia was induced by bilateral carotid artery occlusion and hypobaric hypotension. rCBF and tissue hemoglobin oxygen saturation were measured by laser Doppler scanning and a microspectrophotometric method. Ischemic insult and brain temperature were identical in both groups. Body weight and neurological scores recovered in the pretreated group but further deteriorated in the non-treated group (P<0.05). Quantitative histology demonstrated a better neuronal density in neocortex and hippocampal CA2, CA3, and CA4 of pretreated animals (P<0.05).