A09

硫酸鎂藉由 Akt-eNOS 途徑改善急救後的腦部組織灌流及神經學預後

Magnesium Sulfate Enhances Cerebral Perfusion in the Post-resuscitation Phase and Improves Neurological Outcomes by Akt-eNOS Signaling

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Background: Cerebral perfusion is compromised after cardiopulmonary resuscitation (CPR), which prolongs ischemic injury of the brain and worsens neurological outcomes. Magnesium sulfate ($MgSO_4$) can cause vasodilatation and has long been used during CPR. We therefore investigate the roles of $MgSO_4$ on cerebral perfusion in the post-resuscitation phase, and its prognostic implications in survival and neurological outcomes.

Methods: Using a rat model of asphyxia cardiac arrest (6 min) and CPR, we administered $MgSO_4$ during CPR (50 mg/kg) and the first 2 h post-resuscitation (50 mg/kg/hr). The cerebral tissue perfusion was continuously monitored by OxyFLO detector. The brain was harvested 2 h after CPR, with Bax, Bcl-2, Akt and eNOS assessed. In a subgroup with minimal invasive procedures, the survival and neurological outcomes were followed up to 3 days.

Results: Cerebral perfusion was significantly reduced after CPR in the control group. $MgSO_4$ significantly improved the cerebral perfusion ($P < 0.01$ vs. control). This was associated with improved survival (log-rank $P < 0.05$) and neurological scores on day 3 ($P < 0.05$). The Bax/Bcl-2 ratio of the brain 2 h post-CPR was lower in the $MgSO_4$ group. The phosphorylated Akt and eNOS were also increased, suggesting activation of anti-apoptotic signaling via this pathway. Cotreatment with L-NAME (200 μM) abrogated not only the above changes but the enhanced cerebral perfusion. The survival and neurological benefits were also reversed.

Conclusion: $MgSO_4$ employed during CPR and early post-resuscitation phase improves cerebral perfusion and overall prognosis. This is in part mediated by activation of Akt-eNOS signaling that leads to anti-apoptotic protection.

A10

Propofol 抗心臟纖維母細胞增殖之藥理機轉

The Molecular Mechanism of the Anti-oxidative Effects of Propofol on Angiotensin II-induced Cell Proliferation in Rat Cardiac Fibroblasts

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Aim of investigation: Propofol may have beneficial effects on the prevention of angiotensin II (Ang II)-induced cardiac fibroblast proliferation via its anti-oxidative properties. The aim of this study was designed to examine whether propofol may alter Ang II-induced cell proliferation and to identify the putative underlying signaling pathways in rat cardiac fibroblasts.

Methods: The effect of propofol on Ang II-induced NADPH oxidase activity, reactive oxygen species (ROS) formation, ERK1/2 phosphorylation, and activator protein-1 (AP-1)-mediated reporter activity in cultered cardiac fibroblast were examined. In addition, the effect of propofol on nitric oxide (NO) production, protein kinase B (Akt) and eNOS phosphorylations were also tested to elucidate the intracellular mechanism of propofol in proliferation. The p value less than 0.05 were considered significant (ANOVA).

Results: Ang II (100 nM) increased cell proliferation and ET-1 expression which were partially inhibited by propofol (10, 30 μM). Propofol also inhibited Ang II-increased NADPH oxidase activity, ROS formation, ERK phosphorylation, and AP-1-mediated reporter activity. In addition, propofol also increased the nitric oxide generation, Akt and eNOS phosphorylations. L-NAME, an inhibitor of NO synthase, and the short interfering RNA transfection for Akt or eNOS markedly attenuated the inhibitory effect of propofol on Ang II-induced cell proliferation.

Conclusions: we demonstrate for the first time that propofol prevents cardiac fibroblast proliferation by interfering with the generation of ROS and involves the activation of the Akt-eNOS-nitric oxide pathway. Thus, this study delivers important new insight in the molecular pathways that may contribute to the proposed protective effects of propofol in the cardiovascular system

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A11

十二指腸灌食對照胃灌食於內科加護病房患者 - 一前瞻性、隨機性、臨床研究

Duodenal Versus Gastric Feeding in Medical Intensive Care Unit Patients: A Prospective, Randomized, Clinical Study

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Objective: To determine whether medical intensive care unit (ICU) patients receiving nasoduodenal (ND) feedings achieve optimal nutritional support and better clinical outcomes compared to patients receiving nasogastric (NG) feedings.

Design: A prospective, randomized, clinical study.

Setting: Medical ICU of a university-affiliated tertiary medical center.

Patients: 121 medical ICU patients required enteral feeding.

Interventions: Patients were randomized to receive enteral feeding. One group received ND feedings, the other group received NG feedings. All patients followed the same protocol.

Measurements and Main Results: The primary outcome of optimal nutritional support was assessed by measurement of time to goal tube feed rate and daily calorie and protein intake. Secondary clinical outcomes included number of ICU, hospital, and ventilator days, number of the days in the study, blood glucose levels, incidence of vomiting, diarrhea, gastrointestinal bleeding, tube replaced, tube clogged, fever, bacteremia, and ventilator-associated pneumonia (VAP), and mortality rate. Results showed the ND group had a higher average daily calorie and protein intake compared to NG group and achieved nutritional goals earlier. In terms of clinical outcomes, patients in the ND group had a lower rate of vomiting and VAP. The other clinical outcomes such as number of ICU days, hospital days, ventilator days, blood glucose level, tube replaced or clogged, diarrhea, gastrointestinal bleeding, fever, bacteremia, and mortality rate were not significantly different between two groups.

Conclusions: Patients who received ND feedings achieved nutritional goals earlier than those who received NG feeding. ND feeding group also has a lower rate of vomiting and VAP in the medical ICU setting.

Key Words: aspiration; critical illness; enteral nutrition; nasoduodenal feeding; nutritional support; pneumonia

A12

使用靜脈血栓溶解劑於腦中風病人併發蜘蛛膜下腔出血 -- 罕見病例報告

Subarachnoid Hemorrhage, a Rare Complication after Intravenous Thrombolysis in an Ischemic Stroke Patient

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Abstract

Intravenous thrombolysis with alteplase (recombinant tissue plasminogen activator, rt-PA) given within 3 hours of onset of ischemic stroke is widely accepted as first line treatment. Many studies demonstrate the safety and low risk about symptomatic intracerebral hemorrhage under thrombolytic therapy. We present a 47 year-old women encountered a rare but lethal complication — subarachnoid hemorrhage (SAH) after thrombolytic therapy within adequate time window. The possible stroke mechanism is spontaneous middle cerebral artery dissection. We review the literature and believe this is the first patient complicated with SAH after intravenous rt-PA. How to prevent this complication is also discussed.