

论著

高胆红素血症大鼠脑干听觉诱发电位与脑组织NO含量及Na⁺-K⁺ATP酶活性的变化

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收稿日期 2007-1-3 修回日期 2007-7-6 网络版发布日期 2008-12-2 接受日期 2007-7-6

摘要 目的: 探讨脑干听觉诱发电位(BAEP)在早期监测高胆红素血症听力和脑损伤中的作用及脑组织一氧化氮(NO)与胆红素诱导的听力和脑损伤的关系。方法: 15 d SD大鼠腹腔注射不同剂量(30 mg/kg、60 mg/kg、90 mg/kg、120 mg/kg和150 mg/kg)胆红素溶液以制备高胆红素血症动物模型, 微量胆红素测定仪测定血清胆红素浓度, 重氮法测定脑组织胆红素浓度, 定磷法测定脑组织中Na⁺-K⁺ATP酶活性, 硝酸酶还原法测定脑组织NO含量, 诱发电位仪检测BAEP。结果: 建模后高剂量组(120 mg/kg和150 mg/kg)部分大鼠出现异常神经行为活动; 建模6 h后, 除低剂量(30 mg/kg)组外, 各实验组大鼠血清和脑组织胆红素浓度及脑组织NO含量显著升高, 脑组织Na⁺-K⁺ATP酶活性显著降低, BAEP的波峰潜伏期(PL)和波峰间潜伏期(IPL)显著延长; 且BAEP的PL与IPL和脑组织NO含量与Na⁺-K⁺ATP酶活性的变化均与脑组织胆红素水平显著相关。结论: BAEP的PL和IPL是早期监测高胆红素血症听力和脑损伤的无创性指标, NO的过量产生可能参与了胆红素诱导的听力和脑损伤的发病过程。

关键词 [高胆红素血症](#) [诱发电位](#) [听觉](#) [脑干](#) [一氧化氮](#) [Na\(+\)-K\(+\)交换ATP酶](#)

分类号 [R722.17](#)

Changes of BAEP, NO contents and Na⁺-K⁺ATPase activities in brain tissues in rats with hyperbilirubinemia

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Abstract

AIM: To explore the roles of brain-stem auditory evoked potential (BAEP) in early monitoring the hearing loss and brain damages in hyperbilirubinemia and nitric oxide(NO) in the pathogenesis of bilirubin-induced hearing loss and brain damages. METHODS: Different doses of bilirubin solution (30 mg/kg, 60 mg/kg, 90 mg/kg, 120 mg/kg and 150 mg/kg) were injected into the abdominal cavity of 15-day old SD rats to make the animal model of hyperbilirubinemia. The serum concentrations of bilirubin were detected by a micro-gauge. The bilirubin concentrations in the brain tissues were examined via a diazo method. The Na⁺-K⁺ATPase activities in the brain tissues were analyzed by routing phosphorus. The NO contents in the brain tissues were assayed via the method of nitrate reductase. BAEP were recorded with an evoked potential recorder. RESULTS: After making the ejection, parts of the rats in the high dosage groups (120 mg/kg and 150 mg/kg) showed the abnormal neuro-behaviors. After 6 hours of the ejection, the bilirubin concentrations in serum and in brain tissues, and NO contents in the brain tissues were increased significantly. The Na⁺-K⁺ATPase activities in the brain tissues were decreased obviously, and the PL and IPL of BAEP were prolonged significantly in all the experimental rats except the ones in low dosage group (30 mg/kg). The changes of them were closely related to the dose of injected bilirubin. CONCLUSION: The PL and IPL of BAEP are the objective and sensitive indexes for early monitoring the hearing loss and brain damages in hyperbilirubinemia. NO may plays a certain role in the pathogenesis of bilirubin induced hearing loss and brain damages.

Key words [Hyperbilirubinemia](#) [Evoked potentials](#) [Auditory perception](#) [Brain stem](#) [Nitric oxide](#) [Na \(+\)-K\(+\)-exchanging ATPase](#)

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