

论文

ZD7288抑制大鼠穿通纤维—海马CA3区通路的突触传递

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摘要:

目的观察HCN通道特异性阻滞剂ZD7288对大鼠海马CA3区突触传递的影响。方法应用在体电生理细胞外记录技术记录大鼠海马CA3区场电位,用HPLC荧光检测技术测定海马组织氨基酸含量,观察CA3区局部微量给予ZD7288和CsCl后对低频(0.5 Hz)刺激穿通通路(perforant pathway, PP)诱发的海马CA3区群峰电位(population spike, PS)幅度及海马组织氨基酸含量的影响。结果海马CA3区分别注射ZD7288(20, 100和200 nmol)和CsCl(1, 5和10 μmol)可引起PS幅度剂量依赖性下降;药物效应于给药后5 min开始,作用维持时间90 min以上。给予ZD7288(100 nmol)大鼠海马组织谷氨酸、天冬氨酸、甘氨酸及γ-氨基丁酸含量显著降低,与生理盐水对照组比较,差异有显著性意义(P<0.01或P<0.05)。结论ZD7288可显著抑制大鼠穿通纤维—海马CA3区突触传递,并可降低海马组织氨基酸含量。

关键词: ZD7288 超极化激活环核苷酸门控阳离子通道 场电位 氨基酸 海马

ZD7288 inhibits the synaptic transmission in the pathway from perforant pathway fibers to CA3 region in rat hippocampus

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Abstract:

AimTo study the effect of ZD7288 on synaptic transmission in the pathway from perforant pathway (PP) fibers to CA3 region in rat hippocampus. MethodsThe extracellular recording technique *in vivo* was used to record the CA3 region field potentials. High-performance liquid chromatography (HPLC) with fluorescence detection was applied to measure the content of amino acids in hippocampal tissues. The effect of ZD7288 and CsCl on the amplitudes of population spike (PS) in CA3 region evoked by stimulation (0.5 Hz) of the perforant pathway (PP) fibers, and the content of amino acids in hippocampal tissue were observed. ResultsMicroinjection of ZD7288 (20, 100 and 200 nmol) and CsCl (1, 5 and 10 μmol) into CA3 region decreased the population spike (PS) amplitudes in a dose-dependent manner. The inhibitory effects appeared at 5 min after microinjection and lasted at least 90 min. In those rats treated with ZD7288 (100 nmol), the contents of glutamate, aspartate, glycine and GABA decreased significantly as compared to those of saline control (all $P<0.01$, except $P<0.05$ for that of glycine). A similar decrease in the contents of amino acids was observed when the rats were microinjected with CsCl (5 μmol). ConclusionZD7288 could obviously inhibit synaptic transmission in the pathway from PP fibers to CA3 region in rat hippocampus, and this action of ZD7288 may be associated with altered contents of amino acids.

Keywords: hyperpolarization-activated cyclic nucleotide-gated cation channel field potentials amino acids hippocampus ZD7288

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