

论著

可溶性A β 25-35对大鼠海马CA3区神经元延迟整流钾电流的抑制作用

李琳¹, 刘振宅², 贺秉军³, 戚豫¹

¹北京大学 第一医院中心实验室, 北京 100034

²天津医科大学生物医学工程系, 天津 300070

³南开大学生命科学学院, 天津 300071

收稿日期 2007-9-11 修回日期 网络版发布日期 2008-7-1 接受日期

摘要 摘要: 目的 研究可溶性 β -淀粉样蛋白(A β 25-35)对大鼠海马CA3区锥体神经元延迟整流钾电流(I K)的影响。方法 采用酶消化法急性分离新生大鼠海马CA3区神经元, 全细胞膜片钳技术观察加入可溶性A β 25-35后I K的变化。结果 可溶性A β 25-35对I K的作用具有时间依赖性, I K随A β 25-35作用时间的延长而减小, 加药5~7 min后作用趋于稳定。可溶性A β 25-35对I K有明显抑制作用, 加入5 μ mol/L A β 25-35 前后I K峰值分别为(6.987 \pm 1.152)和(2.540 \pm 0.349) nA(n=8, P<0.01); 该抑制作用没有明显的浓度依赖性, 1、2.5和5 μ mol/L 3个浓度的A β 25-35使I K峰值减小率都在60%左右。5 μ mol/L A β 25-35 可显著影响I K激活过程, 作用前后的半数激活电压分别为(4.114 \pm 0.730) 和(-5.463 \pm 0.950) mV(n=15, P<0.05), 但不改变激活曲线的斜率因子。结论 可溶性A β 25-35对海马CA3区神经元I K的抑制作用可能是其产生神经毒性的作用机制之一。

关键词 [阿尔茨海默病](#) [可溶性 \$\beta\$ -淀粉样蛋白](#) [海马CA3区锥体神经元](#) [延迟整流钾电流](#) [全细胞膜片钳](#)

分类号

Inhibitory Effect of Unaggregated Amyloid β Protein (25-35) on Delayed Rectifier Potassium Current in Rat Hippocampal CA3 Pyramidal Neurons

LI Lin¹, LIU Zhen-zhai², HE Bing-jun³, QI Yu¹

¹Central Laboratory, the First Hospital, Peking University, Beijing 100034, China

²Department of Biomedical Engineering, Tianjin Medical University, Tianjin 300070, China

³Institute of Life Sciences, Nankai University, Tianjin 300071, China

Abstract

ABSTRACT: Objective To investigate the effect of unaggregated A β 25-35 on delayed rectifier potassium current (I K) in neonatal rat hippocampal CA3 pyramidal neurons. Methods The rat hippocampal neurons were enzymatically isolated from 10-11-day-old Wistar rat. The I K was recorded using whole-cell patch clamp technique. Results The inhibitory effect of unaggregated A β 25-35 on I K was time-dependent, because I k significantly decreased from (6.987 \pm 1.152) nA to (2.540 \pm 0.349) nA after adding unaggregated A β 25-35 and reached a stabilized level after 5-7 min (n=8, P<0.01). However, the inhibitory effect was not concentration-dependent, because the decrease of the I K amplitude in different concentration groups were all around 60%. Unaggregated A β 25-35 also remarkably affected the half-activation potential, which was (4.114 \pm 0.730) mV and (-5.463 \pm 0.950) mV before and after its application (n=15, P<0.05); however, the slope factor of activation curve was not significantly changed. Conclusion The inhibitory effect of unaggregated A β 25-35 on I k may be a possible mechanism involved in the pathogenesis of Alzheimer's disease.

Key words [Alzheimer's disease](#) [unaggregated amyloid \$\beta\$ protein \(25-35\)](#) [hippocampal CA3 pyramidal neuron](#) [delayed rectifier potassium channel](#) [whole-cell patch clamp recording](#)

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通讯作者 刘振宅 liuzhai@nankai.edu.cn

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