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听觉剥夺幼鼠学习记忆能力及听皮层超微结构研究 [点此下载全文](#)

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摘要:

**摘要目的:** 探讨听觉剥夺对幼鼠学习记忆的影响及听皮层细胞超微结构的变化。**方法:** 将36只SD幼鼠随机分为听觉剥夺组和正常对照组。听觉剥夺组在生后第7天用阿米卡星500mg/kg·d皮下注射, 直到生后第16天, 建立听觉剥夺模型。分别于生后第3周、5周、7周进行Morris水迷宫测试, 检测各组幼鼠的学习记忆能力。行为学测试完毕后, 观察听皮层超微结构的变化。对照组只进行等容量生理盐水皮下注射。结果: ①定位航行实验: 3周龄听觉剥夺组和对照组每天逃避潜伏期差异均无显著性意义(P值均>0.05); 5周龄听觉剥夺组幼鼠自第2天起, 每天的逃避潜伏期均较同龄对照组延长, 差异有显著性意义(P值分别P<0.05、P<0.01、P<0.01); 7周龄听觉剥夺组幼鼠每天逃避潜伏期均较同龄正常鼠延长, 差异有显著性意义(P值分别P<0.05、P<0.01、P<0.01、P<0.01)。②空间探索实验: 生后3周龄幼鼠听觉剥夺组及对照组在目标象限游泳时间及跨越平台次数差异无显著性意义(P>0.05); 5周龄、7周龄听觉剥夺组在目标象限的游泳时间均短于正常对照组(P<0.05、P<0.01), 跨越平台次数较对照组减少, 差异均有显著性意义(P值均<0.05)。③对照组神经元形态完整, 结构清晰, 细胞器丰富; 突触丰富, 突触前膜、后膜结构及突触间隙清晰, 突触囊泡多。听觉剥夺组神经元肿胀, 细胞器明显减少; 突触囊泡数量减少, 突触前、后膜结构模糊不清, 突触间隙融合。结论: 听觉剥夺幼鼠学习记忆能力下降, 并与听皮层神经元及突触超微结构改变密切相关。

**关键词:** [听觉剥夺](#) [学习](#) [记忆](#) [听皮层](#)

The effects of auditory deprivation on abilities of learning and memory and the changes of ultrastructure of auditory cortex in newborn rats [Download Fulltext](#)

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Abstract:

**Abstract Objective:** To investigate the effects of auditory deprivation(AD) on abilities of learning and memory and the changes of ultrastructure of auditory cortex in newborn rats. **Method:** Experiments were performed on 36 newborn Sprague-Dawley rats. Animals were randomly assigned to two experimental groups: AD group and normal control(NC) group. Newborn rats in AD group were given amikacin 500mg/kg·d subcutaneously from the 7th (P7) to the 16th(P16) postnatal d to establish auditory deprivation models. Newborn rats in NC group were given the same volume of normal saline subcutaneously only. The abilities of learning and memory were tested by Morris water maze at different time points. After behavior test, the ultrastructure of auditory cortex neurons were observed by electron microscope. **Result:**①Place navigation test: Comparisons were made among the mean escape latencies each d. At the P3week, comparisons between AD group and NC group showed no significant difference everyday (P>0.05). At the P5week, from the 2nd d on, the mean escape latencies of rats in AD group were much longer than those in NC group (P<0.05, P<0.01, P<0.01). At the P7 week, from the 1st d on, the mean escape latencies of rats in AD group were much longer than those in NC group (P<0.05, P<0.01, P<0.01, P<0.01). ②Spatial probe test(SPT): the time for swimming in target quadrant in AD group decreased significantly compared with that in NC group after the P5 week (P<0.01 and P<0.05), the times of crossing the platform in AD group reduced significantly compared with that in NC rats after the P5 week (P<0.01 and P<0.05). ③In auditory cortex area of rats in NC group, there were intact neurons, distinct structure, abundant organelles. Synapses were abundant with distinct pre-and-post synaptic membranes and rich synaptic vesicles. The synaptic cleft was clear. In AD group, however, there were edematous neurons, mitochondria, Golgi apparatus and polyribosome reduced, synapses reduced with indistinct pre-and-post synaptic membranes, synaptic vesicles decreased. The synaptic cleft was unclear. **Conclusion:** Auditory deprivation can decrease the abilities of learning and memory in newborn rats, which is correlated with the changes in the ultrastructure of auditory cortex neurons and synapses.

**Keywords:** [auditory deprivation](#) [learning](#) [memory](#) [auditory cortex](#)

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