

# 锂对铅引起的大鼠海马CA1区长时程增强效应(LTP)损伤的修复作用

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应用离体脑片记录技术,记录大鼠海马CA1区的兴奋性突触后电位(EPSPs),研究了锂对铅引起的大鼠海马CA1区长时程增强效应(long-term potentiation, LTP)损伤的修复作用。结果表明:对照组大鼠海马CA1区LTP幅度为 $194.42 \pm 14.05\%$  ( $n=10$ );铅处理组LTP的幅度为 $147.06 \pm 9.55\%$  ( $n=13$ );而锂加铅处理组LTP的幅度为 $193.45 \pm 14.91\%$  ( $n=15$ )。与对照组相比,铅处理组LTP的幅度降低了47.36%,而锂几乎完全修复了铅对大鼠海马CA1区LTP幅度的损伤。锂和铅处理后对大鼠海马CA1区的双脉冲易化(paired-pulse facilitation, PPF)都有一定的抑制作用,在脉冲间隔为50 ms时,这种抑制效应最大:对照组为 $155.58 \pm 6.35\%$  ( $n=7$ );铅暴露组为 $150.26 \pm 13.74\%$  ( $n=8$ );锂加铅处理组为 $140.59 \pm 15.42\%$  ( $n=8$ )。结果表明:锂对铅引起大鼠海马CA1区LTP的损伤有一定的修复作用。

## LITHIUM RESTORES THE LEAD-INDUCED IMPAIRMENT OF THE LONG-TERM POTENTIATION IN THE CA1 REGION OF RAT HIPPOCAMPUS

The protective effects of lithium on the lead-induced impairment of long-term potentiation (LTP) were studied by recording excitatory postsynaptic potentials (EPSPs) in CA1 region of rat hippocampus in vitro. The LTP amplitude in hippocampus slices of control rats, chronic lead exposure rats and chronic lithium plus lead administration rats are  $194.42 \pm 14.05\%$  ( $n=10$ );  $147.06 \pm 9.55\%$  ( $n=13$ ) and  $193.45 \pm 14.91\%$  ( $n=15$ ) respectively. Chronic lead exposure inhibited LTP amplitude while chronic lithium administration almost restores the impairment of LTP by lead exposure. Chronic lead and lithium exposure differently inhibited paired-pulse facilitation (PPF) and the inhibitory effect was largest when PPF was measured at 50ms inter-pulse interval. The PPF value in control:  $155.58 \pm 6.35\%$  ( $n=7$ ); Pb:  $150.26 \pm 13.74\%$  ( $n=8$ ); PbLi:  $140.59 \pm 15.42\%$  ( $n=8$ ). The results showed that chronic lithium administration may protect the impairment of LTP caused by chronic lead exposure in CA1 region of rat hippocampus.

### 关键词

锂(Lithium); 铅(Lead); 海马脑片(Hippocampal slices); 长时程增强效应(LTP) (Long-term potentiation)