Sequential up-regulation of the c-fos, c-jun and bax genes in the cortex, striatum and cerebellum induced by a single injection of low dose of 1-methyl-4 phenyl-1,2,3,6-tetrahydropyridine (MPTP) in C57BL/6 mice

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摘要

Abstract

We investigated whether single injection of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) (20 mg/kg) will alter the expression of pro-apoptotic genes, namely, the c-fos, c-jun, and bax, in the striatum, cortex, and cerebellum of adult male C57BL/6 mice using reverse transcription-polymerase chain reaction assay. Injection of MPTP induced a transient decrease in the content of tyrosine hydroxylase estimated by the immunoreactivity in the striatum, which completely recovered 14 day after injection. A rapid but transient up-regulation of c-fos and c-jun genes occurred an hour after MPTP-injection, and a delayed but persistent up-regulation of bax gene expression occurred 3 day after injection. The up-regulation of these genes was present in all the examined brain regions. This result suggests that MPTP, at a low dose causing transient degeneration in the striatum, is capable of triggering two genetic pathways related to the generation of apoptosis in both dopaminergic and non-dopaminergic systems in the mouse brain.