AMPHETAMINE-INDUCED ENHANCEMENT OF NEOSTRIATAL IN VIVO MICRODIALYSATE DOPAMINE CONTENT IN RATS, QUINPIROLE-PRIMED AS NEONATES

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Amphetamine (AMPH)-induced sensitization of central dopamine (DA) receptors, produced by repeated AMPH treatments, is associated with increased AMPH-induced DA release in the rat forebrain. However, for DA receptor sensitization produced by repeated DA receptor agonist treatments, the effects on forebrain DA release are not known. The objective of our study was to determine this. DA receptor sensitization was produced by administering the DA D₂ agonist quinpirole (50 μg/kg/day) to rats, from the 1st to 11th days after birth – a process known as ‘priming’. When these rats were tested at 3 months, DA receptor sensitization was manifested as increased quinpirole-induced yawning. We also found that AMPH (1.0 mg/kg, ip) acutely induced a 5-fold greater increase in DA content in the neostriatal in vivo microdialysate of these quinpirole-primed rats (vs. controls), accompanied by a reduction in dihydroxyphenylacetic acid (DOPAC) and homovanillic acid (HVA) levels in the microdialysate. Conversely, an acute injection of quinpirole · HCl (100 μg/kg, ip) reduced the microdialysate contents of DA, DOPAC and HVA to comparable levels in quinpirole-primed and control rats. Therefore, we can conclude that long-lived DA receptor sensitization, produced by repeated DA D₂ agonist treatments in ontogeny, is associated with enhanced AMPH-induced DA release in the neostriatum in adulthood, but is not accompanied by evident alteration in quinpirole-induced DA release.

Key words: amphetamine, dopamine, in vivo microdialysis, quinpirole-priming, rats

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